Preference Reversals of a Different Kind: The "More Is Less" Phenomenon

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The theory of riskless choice, as pioneered by Jeremy Bentham and James Mill, characterizes utility maximization as an individual process whereby decision makers' preferences are consistent and stable. If preferences are labile and subject to the whims of circumstance, then no optimization principles may underlie even the most straightforward of choices (David M. Grether and Charles Plott, 1979). While minimal systematic market-based evidence exists to refute the fundamental utilitarian premises in riskless settings, what has been observed in the plethora of studies examining decisions subject to uncertainty contradicts the notion of consistent and well-defined preference orderings.[1] Amongst this lot of studies is the oft-cited preference reversal literature: theoretically equivalent measures of preference, such as choices and prices, can lead to systematically different preference orderings (see, e.g., Paul Slovic and Sarah Lichtenstein, 1968). Although preference reversals have been found in a myriad of settings, many economists have been slow to accept their findings, partly because some studies suggest that preference reversals can be eradicated in market settings (Yun-Peng Chu and Ruey-Ling Chu, 1990; James C. Cox and Grether, 1996).

In this study I gather primary data from a well-functioning marketplace to document a different kind of preference reversal in a riskless setting: preferences that reverse across separate and joint evaluation modes. To examine preferences across joint and separate decision modes, I collect data from everyday consumers behaving in a competitive marketplace—the sportscard market. The sportscard marketplace is a natural setting for an examination of preferences, as it provides a rich pool of subjects making decisions in a familiar environment. In addition, it provides a natural variation across individual levels of expertise. I make use of this variation by conducting some of the treatments with professional dealers and others with ordinary consumers. The design was used to capture the distinction between those consumers that have intense market experience (dealers) and those that have less market experience (nondealers). Finally, as I have argued elsewhere (e.g., List, 2001), a major advantage of this particular field experimental design is that my laboratory is the marketplace: subjects would be engaging in similar activities whether I attended the sportscard show or went fishing. In this sense, I am gathering data in the least obtrusive way possible while still maintaining the necessary control to execute a clean comparison between treatments.

The experimental results are sharp. Comparing behavior from more than 240 subjects valuing private commodity bundles, I find a tendency for preferences to reverse: while juxtaposed, the superior bundle is consistently valued more highly, yet in isolation the inferior bundle is preferred—a "more is less" result.[2] The results are robust across choice and price elicitations, as well as experienced and inexperienced consumers, although the magnitude of the effect is significantly attenuated for super-experienced consumers. In a normative sense, these results suggest that individual preferences

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[1] This does not imply that anomalies have been absent from choice in riskless settings. One would come to quite the opposite conclusion upon reading the work of, for example, Jack L. Knetsch (1989), Daniel Kahneman et al. (1990), and Julie R. Irwin et al. (1993).

[2] The astute reader will notice the similarities of my study with the work of, for example, Max Bazerman, Christopher Hsee, George Loewenstein, and their respective associates. Later I compare and contrast my study to these psychology studies.

in a risk-free environment may not typically be stable and well defined. Accordingly, these findings should influence the extensive literature that has concentrated on finding nonexpected utility resolutions to paradoxes of choice.

From a policy perspective, these results merit serious consideration in several circles. One particularly important area concerns benefit-cost analysis—since President Reagan's 1981 Executive Order 12291, federal agencies are required to consider both the benefits and costs of regulations prior to their implementation. While economists have long measured the benefits and costs of private goods routinely bought and sold in the marketplace, a much more difficult task faces the researcher interested in estimating the benefits of increased air and water quality, for example. Two very distinct methodologies are currently used to estimate the total value of nonmarket goods and services: (i) dichotomous choice questions, wherein the good or service under consideration is valued in isolation, and (ii) choice-based methods, wherein the economic agent selects the most preferred alternative from a *set* of choices. Thus, with the proper presentation of attributes, these two institutions could yield opposite policy recommendations. Since benefit-cost analysis remains the central paradigm used throughout the public sector, the results herein indicate that much more attention should be paid to the development of consistent approaches for estimating the benefits and costs of public programs.[3] Several other policy implications are readily apparent—from optimal government spending programs to choosing efficient regulatory regimes.

The remainder of this study proceeds as follows. Section I outlines the experimental design and provides a brief background of related studies. Section II describes the experimental findings. Section III concludes.

I. Experimental Design

The field experiment was carried out on the floor of a sportscard show in a large southwestern city. Each participant's experience typically followed three steps: (1) inspection of the goods, (2) learning the rules and placing a bid, and (3) conclusion of the transaction. In Step 1, a potential subject approached the experimenter's table and inquired about the sale of the baseball cards displayed on the table. The experimenter then invited the potential subject to take about five minutes to participate in an auction or consider the purchase of their most preferred choice (depending on treatment type—see description of treatments below). If the subject accepted the invitation, then she was randomly allocated into one of four treatments.[4]

In treatment IS (IS denotes inferior, separate), I auctioned off 10 1982 *Topps* professionally graded baseball cards. Each of the 10 cards was graded near mint/mint, and the 10-card bundle had a book value of approximately $15. In treatment SS (SS denotes superior, separate), I auctioned off a bundle of 13 cards: the *identical* 10 *Topps* baseball cards *and* an additional 3 different 1982 baseball cards that were professionally graded to be in "poor" condition—the worst grade possible. While the 3 additional cards are of much lower quality than the original 10 cards, they do have economic value: in aggregate, the 13-card bundle had a book value of approximately $18.

In the third treatment, denoted treatment J, I auctioned off the exact same two bundles side by side. Accordingly, each subject submits two bids, one for each commodity bundle. To provide comparable budget sets across the three treatments, I informed subjects in treatment J that if they were deemed winners of both auctions, a random coin toss would determine which auction was binding. Finally, to provide an explicit link to the extant preference reversal literature cited above (e.g., Slovic

[3] Of course, this line of argument overlooks the fact that these results represent serious problems for economics-based methods of decision support in general.

[4] As elaborated on in List and David Lucking-Reiley (2000) and List (2001), field experiments present a trade-off: they give up some of the controls of a laboratory experiment (such as induced valuations) in exchange for increased realism. The current experiments match the real-world settings which economic theory attempts to explain: consumers compete for real goods rather than explicit cash values, they are not told explicitly the distributions of others' valuations, and they are likely to have previous market experience. Although field experiments are not quotidian in the economics literature, they do provide a useful middle ground between the tight controls of the laboratory and the vagaries of completely uncontrolled field data.

TABLE 1—EXPERIMENTAL DESIGN

Subject type	Separate evaluation: bidding	Joint evaluation: bidding	Joint evaluation: choice
Nondealers	IS and SS	J	C
Dealers	IS and SS	J	C

Notes: IS denotes inferior, separate: I auctioned off 10 1982 *Topps* professionally graded baseball cards; SS denotes superior, separate: I auctioned off a bundle of 13 cards: the *identical* 10 *Topps* baseball cards in IS *and* an additional 3 different 1982 baseball cards that were professionally graded to be in "poor" condition—the worst grade possible. J denotes juxtaposed: the exact same two bundles are auctioned off side by side. C denotes choice: market participants choose their preferred bundle rather than bidding in an auction.

and Lichtenstein, 1968), and provide insights into behavior over choices, I ran a fourth treatment, treatment C, in which market participants simply paid me $5 and chose their most preferred bundle (rather than bidding in an auction). Table 1 summarizes the 2×3 experimental design.

In Step 2, the subject learned the allocation rules. In the auction treatments, I used the random nth-price auction as the allocation institution. As described in List and Jason F. Shogren (1998), the random nth-price auction can be characterized by four simple steps: (1) each bidder submits a bid; (2) each bid is rank-ordered from lowest to highest; (3) the monitor selects a random number (n) uniformly distributed between 2 and Z (Z bidders); and (4) the monitor sells one unit of the good to each of the ($n - 1$) highest bidders at the nth price. Akin to Vickrey's second-price auction, the random nth-price auction is theoretically incentive compatible. And, given its potential to include every participant in the market, it has an ability to engage bidders even if they believe they are not near the upper tail of the value distribution. Appendix A provides the general instructions for the random nth-price auctions.

After learning the auction rules, the subject placed her bid. Finally, in Step 3 the experimenter: (i) asked the subject to complete a short survey, which provided demographic data on each subject (see Appendix B for a copy of the survey), and (ii) concluded the experiment by informing the subject that she should return at 6 P.M. on Sunday to find out the results of the auction. Subjects were informed that if they could not return for the specified transaction time, they would be contacted and would receive their cards in the mail (postage paid by the experimenter) within three days of receipt of payment.

Before proceeding to the results summary, I should mention a few noteworthy aspects of the experimental design. First, no subject participated in more than one treatment. Second, if the individual agreed to participate, then she could pick up and visually examine each card (in sealed cardholders, with the grade clearly marked). The experimenter worked one-on-one with the participant, and imposed no time limit on her inspection of the cards. Third, in the nondealer treatments, the treatment type was changed at the top of each hour; hence subjects' treatment type was determined based on the time they visited the table at the card show. The dealer treatments took place in the same fashion as the nondealer treatments, with one exception. Instead of waiting for participants to arrive at the monitor's table, the administrator visited each dealer at his/her booth before the sportscard show opened, alternating the treatment type. Fourth, since my main interest revolves around examining individual preferences, rather than testing the incentive compatibility or efficiency of the allocation mechanism, I informed subjects of the optimal strategy of bidding true value via several examples.

Finally, I would be remiss not to mention related efforts. Interestingly, within mainstream economic circles little is known about juxtaposed versus isolated valuation. Yet, there is evidence of important differences in the psychology literature. The original demonstration of changes in preferences across elicitation formats is provided by Max H. Bazerman et al. (1992). The Bazerman et al. (1992) study focused on absolute versus relative hypothetical payoffs in potential resolutions of a dispute. They found that preferences reversed across scenarios based on whether the choices were evaluated in isolation or juxtaposed. In a valuation study that is more similar in structure to my experimental design, Christopher Hsee (1998) had undergraduate students indicate their hypothetical willingness to pay for one or both sets of dinnerware. Set A contained 24 high-quality pieces, whereas Set B contained 40 pieces—24 high-quality pieces and 16 low-quality pieces. Hsee finds that in separate evaluations Set B is valued less than Set A, but when juxtaposed Set A dominates Set B. Hsee (1998) also performs various related thought experiments using private consumable goods such as scarves, coats, and ice cream cones, and finds similar insights.

To the best of my knowledge, however, the current study is the first to examine the more is less conjecture in an actual marketplace with real transactions, where subjects endogenously enter the marketplace and self-select into their roles as experienced or inexperienced consumers. Indeed, as aforementioned, one major advantage of field experiments is that I am observing the natural behavior of subjects in a familiar marketplace. I believe that empirical assessments of this sort complement laboratory exercises and are a necessary link in the conversion of theory and empirical evidence into optimal policy-making.

II. Experimental Results

Table 2 contains a summary of the experimental data. In total, I observed decisions of 241 subjects: 130 nondealers and 111 dealers. The top panel in Table 2 presents the nondealer data and what readily emerges is a seemingly anomalous result: on average nondealers bid \$4.86 for the 10-card bundle and only \$3.06 for the 13-card bundle, a difference of approximately 37 percent. This difference is statistically significant at the $p < 0.05$ level using a large-sample t-test ($t = 2.03$). Statistical results from a Mann-Whitney rank-sum test of treatment differences, which is a standard nonparametric test that has a null hypothesis of no treatment effect, or that the two samples are derived from identical populations, also suggest that the distributions observed in treatments IS and SS are statistically different at the $p < 0.05$ level ($z = 2.47$). This result implies that the 10-card bid distribution is located to the right of the 13-card bid distribution—a more is less result.

Moving down Table 2 to treatment J, I find evidence that suggests preferences reverse across decision modes: the 10-card bundle's mean bid is \$3.72 whereas the 13-card bundle's mean bid is \$4.52, a difference of approximately 20 percent. And, using both a matched-pairs t-test and a Wilcoxon signed-rank test for matched pairs (recall that in Treatment J each subject submits two bids, one for each commodity bundle, thus the statistical tests must account for this dependence), I can reject the hypothesis that the revealed values in the 10-card auction are derived from the same parental population as the values from the 13-card auction at the $p < 0.01$ level. This result is robust to a significant change in the elicitation technique: 23 of 25 (92 percent) subjects chose the 13-card bundle when given the *choice* of bundles in treatment C. This proportion is significantly different from the 2 of 25 (8 percent) subjects that chose the 10-card bundle.

While these results are stark, and quite surprising to observe in a mature market setting, a commentator could contend that if a fundamental more is less preference reversal exists, it should prevail regardless of the level of subject experience. This concern is notable since, as aforementioned, some studies suggest that preference reversals in risky decisions can be eradicated in market settings (e.g., Chu and Chu, 1990). And, within the sportscard market, I

TABLE 2—EXPERIMENTAL RESULTS

	Bundle	
Treatment	10 cards	13 cards
Nondealers	Bidding data	
IS ($n = 35$)	\$4.86 (0.65)	—
SS ($n = 37$)	—	\$3.06 (0.60)
J ($n = 33$)	\$3.72 (0.53)	\$4.52 (0.69)
	Choices	
C ($n = 25$)	2/25 (8 percent)	23/25 (92 percent)
Dealers	Bidding data	
IS ($n = 35$)	\$3.20 (0.44)	—
SS ($n = 35$)	—	\$2.70 (0.41)
J ($n = 28$)	\$3.09 (0.47)	\$3.45 (0.50)
	Choices	
C ($n = 13$)	0/13 (0 percent)	13/13 (100 percent)

Notes: Figures below bids (choices) are mean bids (the number of subjects choosing that bundle). Figures in parentheses under bids (choices) are standard errors (percentage of subjects making that choice). For example, the mean bid in the nondealer IS treatment was \$4.86 (with a 0.65 standard error) and the number of dealers choosing the 13-card bundle was 13 (100 percent).

have observed that experienced and inexperienced consumers behave much differently over other types of riskless decisions (List, 2001). In this regard, the more is less preference reversal may merely be a mistake, and might disappear if subjects gain marketlike experience.

The bottom panel of Table 2 contains a summary of the dealer data. Even in this subject pool, which could reasonably be considered "super-experienced" consumers, I find evidence in favor of a more is less phenomenon. The mean dealer bid in the 10-card auction is \$3.20, whereas the mean bid decreases to \$2.70 for the 13-card bundle. While I find that these bidding distributions are not statistically different from one another at conventional levels via a Mann-Whitney rank-sum test ($z = 0.84$) and a large-sample t-test ($t = 0.84$), the observed difference of more than 15 percent is noteworthy.

Yet, when the bundles are juxtaposed, statistically significant differences are found. In treatment J, I observe mean bids of \$3.09 and \$3.45 for the 10- and 13-card bundles. Using both a matched-pairs t-test and a Wilcoxon signed-rank test for matched pairs, I can reject the null hypothesis that bids in the 10-card auction are derived from the same parental population as bids in the 13-card auction at the $p < 0.01$ level ($t = 3.73$). This result also holds when I examine data from treatment C: although the sample is small, it is readily apparent that dealers opted for the 13-card bundle significantly more than they chose the 10-card bundle.[5]

As previously mentioned, while these data are the first to document the more is less preference reversal in an actual market with real transactions, they are entirely consistent with the work of Bazerman, Hsee, Loewenstein, and associates, who were the first to document the more is less result in an environment where undergraduate or graduate students stated their maximum willingness-to-pay across hypothetical valuation exercises. The psychology literature cites several competing theoretical explanations for the anomaly (see Bazerman et al., 1999, and Hsee et al., 1999, for nice reviews). While several theories exist, those that have gained the most attention include the evaluability hypothesis (e.g., Hsee, 1996, 1998; Hsee et al., 1999), norm theory (e.g., Kahneman and D. T. Miller, 1986), and the want/should proposition (Bazerman et al., 1998).

Briefly, the first of these theories conjectures that easy to evaluate characteristics, not necessarily the most important, are used when an individual values the good in isolation. These characteristics may have little correlation with the actual value of the good. Yet, when the good is juxtaposed with another, the reference attributes are better defined, allowing the subject to focus attention on the critical characteristics. Norm theory suggests that in one's attempt to evaluate a good in isolation, the evaluator evokes a set of available internal referents for comparison and evaluates the good in this context. When goods are juxtaposed, the alternatives themselves become the comparison set for evaluation. Finally, the want/should proposition offered by Bazerman et al. (1998) envisions a tension between what an individual wants and what the individual believes that he or she should do. Under separate evaluation, the agent tends to engage in behavior along the lines of "wants," and in joint evaluation the individual chooses along the "should" dimension.[6]

III. Conclusions

The theory of riskless choice assumes that economic agents have consistent and well-

[5] Although analysis of the raw data provides consistent evidence in support of preference reversals, there has been no attempt to control for other factors that may affect the individual bidding level. These other subject-specific factors, which include years of trading experience, gender, income, education, and age, can be adequately accounted for in a well-specified econometric model. To condition on these factors, I estimated the following bid regression model: $bid = g(\alpha + \beta X)$; where X includes subject-specific variables that may affect the bidding level. Variables in X include years of trading experience, yearly income, age, gender, education, and dichotomous variables indicating treatment type (separate or joint evaluation) and bidder type (dealer or nondealer). Empirical results from this simple exercise provide results consonant with the implications of the raw data: coefficient signs and magnitudes are consistent with preference reversals, but they are attenuated for dealers.

[6] A companion explanation for the data observed in this study is one of imperfect observation. In this case, an agent uncertain about the value of the goods produces a range rather than a point estimate of value when evaluating the goods in isolation. When presented with the 10-card bundle the range is smaller than that of the 13-card bundle. Under certain assumptions, this theory, which was graciously offered by the editor, can organize many of the findings herein.

defined preferences. While preferences have been shown to be quite labile in risky settings, little experimental work examining real choices in actual markets has been done to formally test the stability of preferences in riskless decision-making. If preferences are ill defined and constructed during the elicitation process, then a reevaluation of the fundamental building blocks of utility theory is necessary. In this study, I examine whether preferences in a competitive marketplace are stable and well defined. Comparing behavior from more than 240 subjects across joint and separate evaluation of two private commodity bundles, I find a surprising preference reversal: while juxtaposed, the superior bundle is consistently valued more highly, yet in isolation the inferior bundle is preferred—a "more is less" result. The reversal is robust across choice and price elicitations, as well as experienced and inexperienced consumers, although the magnitude of the reversal is significantly attenuated for super-experienced consumers.

Overall, these empirical results should have practical significance for economic theorists, empirical researchers, policy makers, and the growing body of scientific research that uses experimental methods. For example, these findings should lend new insights into nonexpected utility resolutions to paradoxes of choice. And, in light of the empirical evidence herein, rather than accepting that dichotomous choice questions are the preferred method to value nonmarket goods and services (as proposed by the National Oceanic and Atmospheric Administration's blue-ribbon panel, which included Kenneth Arrow and Robert Solow), a closer examination of the various nonmarket valuation methodologies seems apropos. Besides this perhaps narrowly focused policy-based example, these results may have sharp implications for a broad array of issues—e.g., potential resolutions of disputes, sorting of employees into respective jobs, the structuring of optimal welfare benefit plans, social security reform, and several other governmental spending and revenue-raising programs.

Appendix A: Subject Instructions for Random *n*th-Price Auction

Welcome to Lister's Auctions. You have the opportunity to bid in an auction for the goods on the table. The number of auction participants, denoted "*n*" below, will be determined by how many subjects choose to participate in the auction during this sportscard show.

Auction Rules:

You are asked to submit one bid. Since there are $n - 1$ other bidders, there will be a total of n bids submitted. The monitor will rank these n bids from highest to lowest and the winning bidder(s) will be determined in a random fashion. Here is how it works: if the monitor randomly selected the bid ranked #20 (the 20th highest bid), then each of the 19 bidders who bid more than this bid would win in the auction and receive the goods after they sent me the value of the 20th highest bid. There is an equal chance that the selected bid will be the 2nd, 3rd, 4th, 5th, 6th, ... or *n*th highest bid. Lets go through a few examples so you understand the auction rules.

Assume that the randomly determined bid is the 8th highest. I will rank the bids from highest to lowest to determine the winners.

Example 1: The 10 highest bids are ranked highest to lowest as follows:

\$C	High bidder
\$D	2nd highest bidder
\$A	3
\$B	4
\$F	5
\$G	6
\$L	7
\$K	8
\$V	9
\$Z	10th highest bidder

Since the 8th highest bid was chosen, the top 7 bidders win and pay the value of the 8th highest bid. In this case, that is \$K.

Would you like to go through some more examples?

As you can see, in this type of auction you should bid your true value for the goods (e.g., what they are worth to you). If you bid too much, then you stand a risk of winning but paying more than what they are worth to you. If you bid below your true value, then you stand a risk of not winning the goods when you could have won and paid less than your true value.

This is true because your bid never affects the price that you pay in the auction, just whether you win or lose.

Would you like to go through some more examples that illustrate why bidding your true value makes sense?

Final Transaction

At 6 P.M. Sunday night I will determine the winners of the auction. After the winners pay me (cash or check) for the goods, the goods will be awarded to the winners. Note, regardless of price, the goods will be awarded to the winners. In case you cannot attend the "determination of winners" session at 6 P.M., please provide your name, mailing address, and phone number below:

Name ______________

Address _________________________

Phone# ____________

If you are unable to attend at 6 P.M., I will contact you by phone. Upon receipt of your check or cash, I will send you the goods that you have won. All postage will be paid by Lister's Auctions for goods mailed to winners.

Note that I guarantee to sell the goods to the winners no matter what the final auction prices turn out to be. Your bid represents a binding commitment to buy the goods you win at the prices specified by the auction outcomes.

Good luck—please write your bids on the sheets provided.

Thanks for participating.

Appendix B: Confidential Bidding and Survey Sheet

BID:$ ____________
Signature: _________________________

I verify that if I am determined a winner I will be liable for paying the determined amount in exchange for the bundle of cards.
Please complete the information below. THIS INFORMATION WILL BE KEPT STRICTLY CONFIDENTIAL.

1. How long have you been active in the sportscard and memorabilia market? _____ yrs
2. Are you a sportscard or sports memorabilia professional dealer? _____
3. Gender: 1) Male 2) Female
4. Age _____ Date of Birth _____
5. What is the highest grade of education that you have completed? (Circle one)
   1) Eighth Grade
   2) High School
   3) 2-Year College
   4) Other Post-High School
   5) 4-Year College
   6) Graduate School Education
6. What is your approximate yearly income from all sources, before taxes?
   1) Less than $10,000
   2) $10,000 to $19,999
   3) $20,000 to $29,999
   4) $30,000 to $39,999
   5) $40,000 to $49,999
   6) $50,000 to $74,999
   7) $75,000 to $99,999
   8) $100,000 or over
7. Have you ever seen these goods before this show? ____________

REFERENCES

Bazerman, Max H.; Loewenstein, George F. and Blount White, Sally. "Reversals of Preference in Allocation Decisions: Judging an Alternative Versus Choosing Among Alternatives." *Administrative Science Quarterly*, 1992, *37*, pp. 220–40.

Bazerman, Max H.; Moore, Don A.; Tenbrunsel, Ann E.; Wade-Benzoni, Kimberly A. and Blount, Sally. "Explaining How Preferences Change across Joint versus Separate Evaluation." *Journal of Economic Behavior and Organization*, May 1999, *39*(1), pp. 41–58.

Bazerman, Max H.; Tenbrunsel, Ann E. and Wade-Benzoni, Kimberly A. "Negotiating with Yourself and Losing: Understanding and Managing Competing Internal Preferences." *Academy of Management Review*, 1998, *23*, pp. 225–41.

Chu, Yun-Peng and Chu, Ruey-Ling. "The Subsidence of Preference Reversals in Simplified and Marketlike Experimental Settings: A

Note." *American Economic Review*, September 1990, *80*(4), pp. 902–11.

Cox, James C. and Grether, David M. "The Preference Reversal Phenomenon: Response Mode, Markets and Incentives." *Economic Theory*, April 1996, *7*(3), pp. 381–405.

Grether, David M. and Plott, Charles. "Economic Theory of Choice and the Preference Reversal Phenomenon." *American Economic Review*, September 1979, *69*(4), pp. 623–38.

Hsee, Christopher K. "The Evaluability Hypothesis: An Explanation for Preference Reversals Between Joint and Separate Evaluations of Alternatives." *Organizational Behavior and Human Decision Processes*, 1996, *67*, pp. 247–57.

______ **.** "Less Is Better: When Low-Value Options Are Valued More Highly than High-Valued Options." *Journal of Behavioral Decision Making*, 1998, *11*, pp. 107–21.

Hsee, Christopher K.; Loewenstein, George F.; Blount, Sally and Bazerman, Max H. "Preference Reversals Between Joint and Separate Evaluations of Options: A Review and Theoretical Analysis." *Psychological Bulletin*, 1999, *125*, pp. 576–90.

Irwin, Julie R.; Slovic, Paul; Lichtenstein, Sarah and McClelland, Gary H. "Preference Reversals and the Measurement of Environmental Values. *Journal of Risk and Uncertainty*, January 1993, *6*(1), pp. 5–18.

Kahneman, Daniel; Knetsch, Jack L. and Thaler, Richard H. "Experimental Tests of the Endowment Effect and the Coase Theorem." *Journal of Political Economy*, December 1990, *98*(6), pp. 1325–48.

Kahneman, Daniel and Miller, D. T. "Norm Theory: Comparing Reality to its Alternatives." *Psychological Review*, 1986, *93*, pp. 136–53.

Knetsch, Jack L. "The Endowment Effect and Evidence of Nonreversible Indifference Curves." *American Economic Review*, December 1989, *79*(5), pp. 1277–84.

List, John A. "Do Explicit Warnings Eliminate the Hypothetical Bias in Elicitation Procedures? Evidence from Field Auctions for Sportscards." *American Economic Review*, December 2001, *91*(5), pp. 1498–507.

List, John A. and Lucking-Reiley, David. "Demand Reduction in Multiunit Auctions: Evidence from a Sportscard Field Experiment." *American Economic Review*, September 2000, *90*(4), pp. 961–72.

List, John A. and Shogren, Jason F. "The Deadweight Loss of Christmas: Comment." *American Economic Review*, December 1998, *88*(5), pp. 1350–55.

Slovic, Paul and Lichtenstein, Sarah. "Relative Importance of Probabilities and Payoffs in Risk-Taking." *Journal of Experimental Psychology Monographs*, 1968, *78*, pp. 1–18.

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3. Jiao ZhangJoint versus Separate Modes of Evaluation 211-238. [CrossRef]
4. Wen Mao. 2015. Sometimes "Fee" Is Better Than "Free": Token Promotional Pricing and Consumer Reactions to Price Promotion Offering Product Upgrades. *Journal of Retailing* . [CrossRef]
5. Milan Zafirovski. 2015. Toward Economic Sociology/Socio-Economics? Sociological Components in Contemporary Economics and Implications for Sociology. *The American Sociologist* . [CrossRef]
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7. Éric Montpetit, Erick Lachapelle. 2015. Information, values and expert decision-making: the case of soil decontamination. *Policy Sciences* . [CrossRef]
8. Martin D. Vestergaard, Wolfram Schultz. 2015. Choice mechanisms for past, temporally extended outcomes. *Proceedings of the Royal Society B: Biological Sciences* **282**, 20141766. [CrossRef]
9. Jonathan E. Alevy, Craig E. Landry, John A. List. 2015. FIELD EXPERIMENTS ON THE ANCHORING OF ECONOMIC VALUATIONS. *Economic Inquiry* **53**:10.1111/ecin.2015.53.issue-3, 1522-1538. [CrossRef]
10. Sandra Laporte, Gilles Laurent. 2015. More prizes are not always more attractive: factors increasing prospective sweepstakes participants' sensitivity to the number of prizes. *Journal of the Academy of Marketing Science* **43**, 395-410. [CrossRef]
11. S. M. Hartzmark. 2015. The Worst, the Best, Ignoring All the Rest: The Rank Effect and Trading Behavior. *Review of Financial Studies* **28**, 1024-1059. [CrossRef]
12. Thomas R. Zentall. 2015. When animals misbehave: Analogs of human biases and suboptimal choice. *Behavioural Processes* **112**, 3-13. [CrossRef]
13. Milan Zafirovski. 2014. Rational Choice Requiem: The Decline of an Economic Paradigm and its Implications for Sociology. *The American Sociologist* **45**, 432-452. [CrossRef]
14. Thomas R. Zentall, Jennifer R. Laude, Jacob P. Case, Carter W. Daniels. 2014. Less means more for pigeons but not always. *Psychonomic Bulletin & Review* **21**, 1623-1628. [CrossRef]
15. Hans De Steur, Dieter Blancquaert, Willy Lambert, Dominique Van Der Straeten, Xavier Gellynck. 2014. Conceptual framework for ex-ante evaluation at the micro/macro level of GM crops with health benefits. *Trends in Food Science & Technology* **39**, 116-134. [CrossRef]
16. Hans De Steur, Filiep Vanhonacker, Shuyi Feng, Xiaoping Shi, Wim Verbeke, Xavier Gellynck. 2014. Cognitive biases and design effects in experimental auctions. *China Agricultural Economic Review* **6**, 413-432. [CrossRef]
17. Claudia Aravena, Peter Martinsson, Riccardo Scarpa. 2014. Does money talk? — The effect of a monetary attribute on the marginal values in a choice experiment. *Energy Economics* **44**, 483-491. [CrossRef]
18. Peter J. Hammond, Horst ZankRationality and Dynamic Consistency Under Risk and Uncertainty 41-97. [CrossRef]

19. Dengfeng Yan, A.V. Muthukrishnan. 2013. Killing Hope with Good Intentions: The Effects of Consolation Prizes on Preference for Lottery Promotions. *Journal of Marketing Research* 140225132926000. [CrossRef]

20. Alistair Munro, Danail Popov. 2013. A portmanteau experiment on the relevance of individual decision anomalies for households. *Experimental Economics* **16**, 335-348. [CrossRef]

21. Lijia Shi, Lisa A. House, Zhifeng Gao. 2013. Impact of Purchase Intentions on Full and Partial Bids in BDM Auctions: Willingness-to-pay for Organic and Local Blueberries. *Journal of Agricultural Economics* **64**:10.1111/jage.2013.64.issue-3, 707-718. [CrossRef]

22. H.K. Bett, K.J. Peters, U.M. Nwankwo, W. Bokelmann. 2013. Estimating consumer preferences and willingness to pay for the underutilised indigenous chicken products. *Food Policy* **41**, 218-225. [CrossRef]

23. Carola Grebitus, Jayson L. Lusk, Rodolfo M. Nayga. 2013. Explaining differences in real and hypothetical experimental auctions and choice experiments with personality. *Journal of Economic Psychology* **36**, 11-26. [CrossRef]

24. Christopher K. Hsee, Jiao Zhang, Liangyan Wang, Shirley Zhang. 2013. Magnitude, Time, and Risk Differ Similarly between Joint and Single Evaluations. *Journal of Consumer Research* **40**, 172-184. [CrossRef]

25. Maria L. Loureiro, Azucena Gracia, Rodolfo M. Nayga. 2013. Do experimental auction estimates pass the scope test?. *Journal of Economic Psychology* . [CrossRef]

26. S. Stachtiaris, A. C. Drichoutis, S. Klonaris. 2013. Preference reversals in Contingent and Inferred valuation methods. *European Review of Agricultural Economics* **40**, 379-404. [CrossRef]

27. CATHERINE L. KLING, JOHN A. LIST, JINHUA ZHAO. 2013. A DYNAMIC EXPLANATION OF THE WILLINGNESS TO PAY AND WILLINGNESS TO ACCEPT DISPARITY. *Economic Inquiry* **51**:10.1111/ecin.2013.51.issue-1, 909-921. [CrossRef]

28. Holger Müller, Eike B. Kroll, Bodo Vogt. 2012. Violations of procedure invariance—The case of preference reversals in monadic and competitive product evaluations. *Journal of Retailing and Consumer Services* . [CrossRef]

29. Eric R. Xu, Emily J. Knight, Jerald D. Kralik. 2011. Rhesus monkeys lack a consistent peak-end effect. *The Quarterly Journal of Experimental Psychology* **64**, 2301-2315. [CrossRef]

30. Adelle X. Yang, Christopher K. Hsee, Yi Liu, Li Zhang. 2011. The supremacy of singular subjectivity: Improving decision quality by removing objective specifications and direct comparisons. *Journal of Consumer Psychology* . [CrossRef]

31. Holger Müller, Eike Benjamin Kroll, Bodo Vogt. 2011. Do real payments really matter? A re-examination of the compromise effect in hypothetical and binding choice settings. *Marketing Letters* . [CrossRef]

32. Devin G. Pope,, Maurice E. Schweitzer. 2011. Is Tiger Woods Loss Averse? Persistent Bias in the Face of Experience, Competition, and High Stakes. *American Economic Review* **101**:1, 129-157. [Abstract] [View PDF article] [PDF with links]

33. John A. List, Imran RasulField Experiments in Labor Economics 103-228. [CrossRef]

34. H. Levy, D. R. Weir. 2010. Take-up of Medicare Part D: Results From the Health and Retirement Study. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences* **65B**, 492-501. [CrossRef]

35. Kristoffer W. Eriksen, Ola Kvaløy. 2010. Do financial advisors exhibit myopic loss aversion?. *Financial Markets and Portfolio Management* **24**, 159-170. [CrossRef]

36. Chi-Ok Oh. 2010. Assessing Recreationists' Economic Benefits and Their Transferability to Other Sites. *Leisure Sciences* **32**, 125-142. [CrossRef]

37. GINGER ZHE JIN, ANDREW KATO, JOHN A. LIST. 2010. THAT'S NEWS TO ME! INFORMATION REVELATION IN PROFESSIONAL CERTIFICATION MARKETS. *Economic Inquiry* **48**:10.1111/ecin.2010.48.issue-1, 104-122. [CrossRef]
38. Uri Simonsohn. 2009. Direct Risk Aversion: Evidence From Risky Prospects Valued Below Their Worst Outcome. *Psychological Science* **20**:10.1111/psci.2009.20.issue-6, 686-692. [CrossRef]
39. Glenn W. Harrison, E. Elisabet Rutström. 2009. Expected utility theory and prospect theory: one wedding and a decent funeral. *Experimental Economics* **12**, 133-158. [CrossRef]
40. J CLARK, L FRIESEN. 2008. The causes of order effects in contingent valuation surveys: An experimental investigation. *Journal of Environmental Economics and Management* **56**, 195-206. [CrossRef]
41. P POPKOWSKILESZCZYC, J PRACEJUS, Y SHEN. 2008. Why more can be less: An inference-based explanation for hyper-subadditivity in bundle valuation#. *Organizational Behavior and Human Decision Processes* **105**, 233-246. [CrossRef]
42. J LADENBURG. 2008. Attitudes towards on-land and offshore wind power development in Denmark; choice of development strategy. *Renewable Energy* **33**, 111-118. [CrossRef]
43. Heribert Gierl, Christina Eleftheriadou. 2006. Simultane oder isolier isolierte te Präsentation von Wahlmöglichkeiten. *der markt* **45**, 55-76. [CrossRef]
44. John A. List. 2005. Scientific Numerology, Preference Anomalies, and Environmental Policymaking. *Environmental and Resource Economics* **32**, 35-53. [CrossRef]
45. MICHAEL S. HAIGH, JOHN A. LIST. 2005. Do Professional Traders Exhibit Myopic Loss Aversion? An Experimental Analysis. *The Journal of Finance* **60**:10.1111/jofi.2005.60.issue-1, 523-534. [CrossRef]
46. J. A. List, M. S. Haigh. 2005. A simple test of expected utility theory using professional traders. *Proceedings of the National Academy of Sciences* **102**, 945-948. [CrossRef]
47. J LIST. 2004. Effects of environmental regulation on foreign and domestic plant births: is there a home field advantage?. *Journal of Urban Economics* **56**, 303-326. [CrossRef]
48. Jayson L. Lusk, Ty Feldkamp, Ted C. Schroeder. 2004. Experimental Auction Procedure: Impact on Valuation of Quality Differentiated Goods. *American Journal of Agricultural Economics* **86**:10.1111/ajae.2004.86.issue-2, 389-405. [CrossRef]
49. JACK L. KNETSCH. 2004. ECONOMICS, ECONOMISTS, AND BEHAVIOURAL ECONOMICS: SOME ISSUES OF CHOICE. *The Singapore Economic Review* **49**, 19-35. [CrossRef]
50. Daniel Kahneman. 2003. Maps of Bounded Rationality: Psychology for Behavioral Economics. *American Economic Review* **93**:5, 1449-1475. [Citation] [View PDF article] [PDF with links]
51. Daniel Kahneman. 2003. A perspective on judgment and choice: Mapping bounded rationality. *American Psychologist* **58**, 697-720. [CrossRef]
52. Glenn W. Harrison, Morten Igel Lau, Elisabet E. Rutström, Melonie B. SullivanELICITING RISK AND TIME PREFERENCES USING FIELD EXPERIMENTS: SOME METHODOLOGICAL ISSUES 125-218. [CrossRef]