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## **THE ENDOWMENT EFFECT: IMPLICATIONS OF RECENT EMPIRICAL DEVELOPMENTS FOR LEGAL THEORY**

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### *ABSTRACT*

*Results from a series of economics experiments suggest that the maximum amount one is willing to pay to obtain a good (“WTP”) is less than the minimum amount one is willing to accept to give up the same good (“WTA”). This observed phenomenon is often referred to as the “endowment effect.” Endowment effect theory, an application of prospect theory, is one of the leading theories invoked to explain observed gaps. In recent years, legal scholars have applied endowment effect theory in both descriptive and normative analyses of law. More recent findings, however, suggest that endowment effect theory does not explain observed gaps. The new evidence supports alternative theories that operate through specific experiment procedures. The purpose of this Article is to describe these recent findings and to consider their implications for legal theory. The results suggest that the focus of legal analyses based on the empirical literature should shift away from assumptions about the shape of individual utility functions. In fact, the most recent findings suggest that gaps observed in the laboratory might have little relevance for policy.*

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## INTRODUCTION

The field of behavioral economics, which focuses on integrating insights from psychology with neoclassical economic theory, has contributed many advances in recent years to improve models of decision-making.<sup>1</sup> Theoretical advances in behavioral economics are often instigated by behavior observed in laboratory experiments that is anomalous to predictions of rational choice theory. One of the longest lines of behavioral economics experimental research challenges a basic tenant of consumer theory: the assumption that individual valuations of goods are independent of entitlement. Results from a series of economics experiments suggest that the minimum amount one is willing to accept to give up a good (“WTA”) is greater than the maximum amount one is willing to pay to obtain the same good (“WTP”).<sup>2</sup> This observed phenomenon is often referred to as the “endowment effect.”<sup>3</sup> Endowment effect theory, an application of prospect theory, is one of the leading explanations.<sup>4</sup> Endowment effect theory posits that entitlements set reference points and individuals perceive the giving up of entitled goods as losses to be averted.<sup>5</sup>

Legal scholars have applied endowment effect theory in both descriptive and normative analyses of behavior in legal environments. For example, Ian Ayres and Frederick Vars use endowment effect theory to explain the court’s mixed response to affirmative action plans.<sup>6</sup> Specifically they posit that judges disfavor layoffs because employees perceive jobs as entitlements and layoffs trigger losses. On the other hand, courts are more supportive of restructured hiring goals because these programs avoid losses. In a more normative vein, Rachlinski and Jourden argue that, because endowment effect theory implies that individuals value rights protected by injunctive remedies more than rights protected by damages remedies, the court should consider this disparity when determining whether to award damages or injunctive relief as a remedy.<sup>7</sup> The authors also discuss broader implications of endowment effect theory for predictions derived from the Coase Theorem.

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<sup>1</sup> For a recent summary see [cite to Camerer, *Advance in Behavioral Economics*]

<sup>2</sup> See *infra* Part I for a summary of economics experiments reporting a gap between WTP and WTA.

<sup>3</sup> See Richard H. Thaler, *Toward a Positive Theory of Consumer Choice*, 1 *Journal of Economic Behavior and Organization* 39, [pin] (1980).

<sup>4</sup> *cites to* Thaler, Jolls, etc.

<sup>5</sup> See *infra* Part I.A.3.

<sup>6</sup> 1998, *Columbia Law Review*

<sup>7</sup> 1998, *Vanderbilt Law Review*

Specifically, if WTA exceeds WTP, outcomes might depend on the legal allocation of rights. Some have argued that the endowment effect is the single most important finding from behavioral economics for legal scholarship to date.<sup>8</sup>

Application of endowment effect theory to law runs far and wide. [**add additional examples of applications here**]

Professor Peter Huang has argued that valuation disparities impact settlement behavior of litigants.<sup>9</sup> [add more here]

Although scholars have applied endowment effect theory to myriad legal fields, their descriptive and normative claims typically rely on the assumption that gaps observed in the laboratory are caused by our reluctance to give up goods to which we are entitled. Recent experimental evidence, however, calls into question the interpretation of observed valuation gaps as evidence of endowment effect theory.<sup>10</sup> The new findings suggest that observed gaps instead are explained by alternative theories that operate through specific experiment procedures. For example, in experiments in which WTA and WTP are elicited using a mechanism specifically designed to encourage individuals to report their actual valuations for goods, unfamiliarity with the mechanism might cause subjects to misconceive how their reported valuations will map into payouts, causing them to revert to their basic market instincts: sell high and buy low. Similarly, in experiments in which subjects are endowed with one good and asked whether they want to trade the endowed good for a good of equal market value, experimenter choice over which good to endow and the public nature of choices might compel subjects to resist trading. Specifically, signaling theories suggest that experimenter involvement might influence choices if subjects interpret the experimenter's choice as a signal of relative quality. Alternatively, theories of other-regarding preferences suggest that subjects might feel obliged to avoid rejecting a good perceived as a gift from the experimenter. Moreover, information aggregation and cascade theories suggest that the public nature of choice revelation—in the conventional experiments subjects are asked to raise their hands if they want to trade—allows for dependence among subject choices.

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<sup>8</sup> See e.g., Russell Korobkin, *The Endowment Effect and Legal Analysis*, 97 *Nw. U. L. Rev.* 1227, 1229 (2003); Samuel Issacharoff, *Can There Be a Behavioral Law and Economics?*, 51 *Vand. L. Rev.* 1729, 1735 (1998).

<sup>9</sup> Peter H. Huang, *Lawsuit Abandonment Options in Possibly Frivolous Litigation Games*, 23 *Rev. Litig.* 47 (2004).

<sup>10</sup> Charles R. Plott and Kathryn Zeiler, *The Willingness to Pay-Willingness to Accept Gap, the "Endowment Effect," Subject Misconceptions, and Experimental Procedures for Eliciting Valuations*, 95 *Am. Econ. Rev.* 530 (2005); Charles R. Plott and Kathryn Zeiler, *Asymmetries in Exchange Behavior Incorrectly Interpreted as Evidence of Endowment Effect Theory and Prospect Theory?*, 97 *Am. Econ. Rev.* 1449 (2007).

The purpose of this paper is two-fold: to describe the recent results and the insights they add to the experimental literature and to consider the implications of these new findings for legal theory. The findings suggest the focus of legal analyses should shift from assumptions about individual perceptions of sales and exchanges as losses to relevant features of legal environments including mechanisms the law uses to encourage individuals to behave optimally and the ways in which legal entitlements are generated. Few, if any, legal environments, however, include features sufficiently similar to those found in laboratory experiments that produce valuation gaps. Therefore, the most recent findings suggest that gaps observed in the laboratory might have little relevance for policy.

The Article is organized as follows. Part I summarizes the empirical findings that seem to reveal a robust WTP-WTA gap in the laboratory. It also provides a review of common interpretations of the results. Finally, it summarizes the most recent findings that suggest observed gaps in the laboratory are explained not by endowment effect theory but rather by alternative theories that find influence through the experiment procedures. Part II attempts to re-conceptualize applications of endowment effect theory in legal scholarship. Part III provides a broader view of the experimental literature, detailing other theories experimentalists are currently testing and how their results might impact legal analysis that applies endowment effect theory. The broader experimental literature leads to a more nuanced understanding of the drivers of observed gaps and asymmetries in the laboratory. The on-going testing of various theories of the drivers of gaps and asymmetries will continue to impact applications of these theories in law.

## I. EMPIRICAL FINDINGS AND INTERPRETATIONS

Experimentalists have been investigating valuation asymmetries in the laboratory since the early 1980s.<sup>11</sup> This Part provides a brief summary of the economics literature. It begins with a snapshot of the conventional results in two separate but related lines of research: WTA-WTP gaps and exchange asymmetries. A common interpretation of the conventional results is then summarized. Finally, recent experimental results are described. The recent results support the conjecture that valuation asymmetries likely should be attributed to procedures used by experimenters rather than to basic features of individual preferences as posited by endowment effect theory.

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<sup>11</sup> Observed gaps were documented well before, however. See e.g., Coombs, Bezembinder and Goode. Testing Expectation Theory of Decision Making without measuring utility or subjective probability. 4 *J of Mathematical Psych* 72 (1967); Hammack and Brown in *Waterfowl and Wetlands*. 1974.

A. Conventional Evidence and Interpretations

1. Evidence: WTP-WTA Gaps

Environmental economists were the first to report observed WTA-WTP gaps. During the 1970s they began to study contingent valuations to help determine appropriate allocations of non-market goods.<sup>12</sup> The findings were striking: many studies reported a much higher WTA relative to WTP.<sup>13</sup> In other words, when consumers were told they were entitled to the good, they placed a (usually) much higher value on it than when they were told they were not entitled to it but could purchase it.

Knetsch and Sinden were among the first to test whether WTA-WTP gaps observed in the field would hold up in the controlled environment of a laboratory.<sup>14</sup> They ran a set of experiments in which half the subjects were endowed with lottery tickets. The remaining subjects were endowed with \$2 in cash. Subjects were told that the lottery winner would choose between two prizes (e.g., a \$70 bookstore gift certificate and \$50 in cash). Ticket owners were then given a choice between keeping the ticket and selling it for \$2. The others were given an opportunity to buy a ticket for \$2. The experimenters hypothesized that once decisions were binding (i.e., subjects actually had to trade rather than merely report hypothetical valuations), the gap would disappear. The data did not support this hypothesis. They found that more ticket owners ended up with tickets than did potential buyers.

Subsequently several experimentalists set out to investigate the nature and robustness of the WTA-WTP gap. Coursey et al. studied whether subject familiarity with the good matters.<sup>15</sup> They also explored whether the nature of

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<sup>12</sup> Contingent valuation studies are designed to measure individual valuation for non-market goods (e.g., wet lands suitable for ducks). See e.g., J. Hammack and G.M. Brown, *Water Fowl and Wet Lands: Toward Bio Economic Analysis*. Baltimore: Johns Hopkins University Press for Resources for the Future (1974). In these studies consumers are asked to value a particular good assuming a market for the good exists or that a tax system could be devised to fund the good's production.

<sup>13</sup> J. Hammack and G.M. Brown, *Water Fowl and Wet Lands: Toward Bio Economic Analysis*. Baltimore: Johns Hopkins University Press for Resources for the Future (1974) (finding that duck hunters would pay \$247 on average to maintain wetlands, but required \$1,044 on average to sell the right to a maintained wetland); Richard C. Bishop, Thomas A. Heberlein and Mary Jo Kealy, *Contingent Valuation of Environmental Assets: Comparisons with a Simulated Market*, 23 *Nat. Resources J.* 619 (1983) (reporting WTA averages between \$21 and \$101 and WTP averages between \$11 and 32 for permits to hunt Canadian geese).

<sup>14</sup> Knetsch and Sinden. *Quarterly J. of Econ.* (1984)

<sup>15</sup> Experimenters conjectured that subjects might have preconceived notions of the value of familiar goods and these notions might confound gap measurements. See e.g., Coursey, Hovis and Schulze, *The Disparity Between Willingness to Accept and Willingness to Pay Measures of Value*, 102 *Quarterly Journal of Economics* 679

the endowed good matters.<sup>16</sup> Ortona and Scacciati investigated how duration of ownership influences one's willingness to trade an endowed good for money<sup>17</sup> and whether results would differ for necessary goods (e.g., required school books) and unnecessary goods (e.g., expensive book on the military).<sup>18</sup> Loewenstein and Issacharoff studied whether individuals place higher values on objects they obtain as a reward for exemplary performance of some task.<sup>19</sup> Shogren et al. investigated whether easily available substitutes for the good affect the magnitude of the gap.<sup>20</sup>

**[I plan to add a broader description of the conventional experimental literature here, organized by inquiry type.]**

Meta-analyses of the WTA-WTP gap literature attempt to draw conclusions from the vast number of individual studies, some of which result in observed gaps and some of which do not.<sup>21</sup> For example, Professors Sayman and Öncüler demonstrate that iterative bidding and within-subjects designs decrease observed gaps, whereas requiring buyers to purchase goods

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(1987) (subjects reported valuations for the right to avoid holding a bitter-tasting liquid in their mouths). See also Dubourg, Jones-Lee and Loomes, Imprecise Preferences and the WTP-WTA Disparity, 9 *J. of Risk and Uncertainty* 115 (1994) (finding that imprecision of preferences over unfamiliar goods (e.g., increase in automobile road safety) explains only a portion of the WTP-WTA disparity).

<sup>16</sup> Coursey, Hovis and Schulze, The Disparity Between Willingness to Accept and Willingness to Pay Measures of Value, 102 *Quarterly Journal of Economics* 679 (1987) (discussing possibility that valuation measurements for lotteries would be confounded by the effects of preference reversals).

<sup>17</sup> Ortona and Scacciati, New Experiments on the Endowment Effect, 13 *Journal of Economic Psychology* 277 (1992) (concluding that endowment possession time does not influence one's valuation of an endowed good). See also Michal A. Strahilevitz and George Loewenstein, The Effect of Ownership History on the Valuation of Objects, 25 *Journal of Consumer Research* 276 (1998) (finding that valuation increases with duration of ownership for goods currently in one's possession and that previous ownership of objects not currently in one's possession increases valuation).

<sup>18</sup> Ortona and Scacciati, New Experiments on the Endowment Effect, 13 *Journal of Economic Psychology* 277 (1992) (finding no gap for necessary and unnecessary goods).

<sup>19</sup> Loewenstein and Issacharoff, *J of Behavioral Decision Making* (?) (1994) (finding that winners of objects value them more highly than those given object after losing).

<sup>20</sup> Shogren, Shin, Hayes and Kliebenstein, *American Economic Review* (1994) (finding mixed results when comparing the effects of goods with easily available substitutes and those without on the gap's magnitude).

<sup>21</sup> J.K. Horowitz and K.E. McConnell, A Review of WTA/WTP Studies, 44 *Journal of Environmental Economics and Management* 426 (2002); Serdar Sayman and Ayşe Öncüler. Effects of study design characteristics on the WTA–WTP disparity: A meta analytical framework, 26 *Journal of Economic Psychology* 289 (2005).

using their own money increases observed gaps.<sup>22</sup> Professors Horowitz and McConnell find that gap size is positively correlated with non-ordinary market goods (e.g., health and safety, the right not to have to experience a bitter-tasting liquid) and the use of incentive compatible elicitation devices.<sup>23</sup>

## 2. Evidence: Exchange Asymmetries

Exchange experiments differ from WTA-WTP gaps experiments in that they do not require subjects to state valuations as sellers and buyers. Rather subjects are endowed with a good and then asked whether they would like to trade the good they own for another good of roughly equal market value.

Professor Jack Knetsch was among the first to report results from exchange experiments.<sup>24</sup> The experiments involved two groups of subjects. Each subject in the first group was given a mug and then asked to complete a questionnaire. Following the questionnaire, the subjects were shown candy bars and told that they could each have one in exchange for the mug. The subjects were instructed to hold up a piece of paper with the word “trade” written on it if the candy bar was preferred to the endowed mug. To reduce transaction costs, the experimenter immediately executed all desired trades by immediately delivering candy bars to the subjects wishing to exchange. Using a second group of subjects, the same experiment was performed except that each subject in the group was endowed with a candy bar and given an option to trade it for a mug. The results were in line with other experiments reporting an exchange asymmetry. Of the 76 subjects endowed with mugs, 89 percent chose to keep the mug. The possibility that subjects simply preferred the mugs to the candy bars was ruled out by the fact that, of the 87 different subjects endowed with candy bars, 90 percent chose to keep the endowed candy bar rather than exchange it for a mug.

Other researchers have obtained similar results using procedures similar to Knetsch’s design. Professor William T. Harbaugh and his co-authors conducted simple exchange experiments using children as subjects to test whether market experience affects reluctance to trade and found that

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<sup>22</sup> Sayman and Öncüler at [pin cite]. Within-subject designs allow subjects to participate in multiple treatments (e.g., report valuations as buyers and sellers). Between-subject designs restrict subjects to participating in just one treatment.

<sup>23</sup> Horowitz and McConnell (2002). Review of WTA-WTP Studies. Incentive compatible devices are designed to provide incentives to encourage subjects to report their true valuations (i.e., the amounts of money that make them indifferent between the money and the good). This result, however, might be driven by the fact that they coded experiments using incentive compatible mechanisms but posing hypothetical choices as incentive compatible. Other experimental studies, however, suggest that asking subjects to engage in real exchanges focuses their attention and is likely to produce responses more likely to correspond to true valuations. [add cites]

<sup>24</sup> This literature review is based on the summary that appears in Plott and Zeiler (2005).

observed exchange asymmetries were independent of market experience levels.<sup>25</sup> In addition, Professor John A. List reported results from exchange experiments also designed to study whether market experience affects exchange asymmetries.<sup>26</sup> He found that subjects with market experience tend not to display exchange asymmetries. For those without market experience, however, he observed a significant asymmetry in choices. Finally, Eric van Dijk and Daan van Knippenberg conducted exchange experiments to test the effects of comparability of consumer goods on the reluctance to trade.<sup>27</sup> Subjects were “rewarded” with a bottle of wine (half one kind and half another) in exchange for participating in the study. Subjects were then allowed to trade with one another. The results suggest that subjects were reluctant to trade in general and were more reluctant to trade when they perceived substantial differences between the endowed good and the alternate good.

### 3. Common Interpretations of Conventional Evidence

Professor Richard Thaler was among the first to posit an explanation for observed WTP-WTA gaps.<sup>28</sup> Thaler argues that observed gaps can be explained by prospect theory—a general theory positing that utility is determined relative to a reference point (“reference-point dependence”) and that individuals are hurt more by losses than they are helped by gains of the same size, causing them to take action to avoid losses (“loss aversion”).<sup>29</sup> In applying prospect theory to explain observed valuation gaps, Thaler suggests that endowment of a particular good establishes an individual’s reference point, and one perceives the sale of the endowed good as a loss.<sup>30</sup> To avoid experiencing a loss from selling, individuals state high amounts when asked

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<sup>25</sup> Harbaugh et al. (2001).

<sup>26</sup> John A. List (2003 and 2004).

<sup>27</sup> van Dijk and van Knippenberg (1998).

<sup>28</sup> Richard Thaler, Towards a Positive Theory of Consumer Choice, 1 *Journal of Economic Behavior & Organization* 39 (1980).

<sup>29</sup> Prospect theory is an alternative to expected utility theory (sometimes called von Neumann-Morgenstern utility), which posits that the utility of an agent facing uncertainty is calculated using a weighed average of utility in each possible state of the world. Von-Neumann and Morgenstern (1944) *Theory of Games and Economic Behavior*. Specifically, prospect theory posits that individual utility functions are characterized by reference point dependence and loss aversion. Unlike expected utility theory, prospect theory suggests that utility depends on one’s reference point or starting point. The theory also assumes individuals experience more disutility from losses than they do utility from gains of the same size. This difference in perception of gains and losses leads to loss aversion, which prompts individuals to take action to avoid losses. See Daniel Kahneman and Amos Tversky, *Prospect Theory: An Analysis of Decisions under Risk*, 47 *Econometrica* 263 (1979).

<sup>30</sup> [add pin cite to either JEBO or JPE]

to reveal the lowest amount of money they would be willing to accept to give up the endowed good. This explanation has been referred to as “endowment effect theory” in the experimental literature.<sup>31</sup> With this theory in mind Thaler coined the term “endowment effect” to refer to the observed phenomenon.<sup>32</sup> Endowment effect theory is thought to be a leading explanation for observed gaps between WTP and WTA.<sup>33</sup>

Endowment effect theory has also been used to explain observed exchange asymmetries. Knetsch concluded from his experimental results that subjects’ choices depended on their endowments.<sup>34</sup> In particular, he suggested that the observed asymmetry resulted from subjects “[weighing] the loss of giving up their initial reference entitlement far more heavily than the foregone gains of not obtaining the alternative entitlement.”<sup>35</sup> In other words, he interpreted the observed behavior as resulting from loss aversion.

Several other theories have been posited to explain observed gaps and exchange asymmetries.<sup>36</sup> First, some have suggested that endowing sellers with a good and leaving buyers’ entitlements unchanged might create wealth effects and that rational choice theory predicts wealth disparities will cause WTA-WTP gaps.<sup>37</sup> Experimenters, however, have tested this theory and found it does not seem to organize the data well.<sup>38</sup> Second, some have

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<sup>31</sup> See Plott and Zeiler (2005) and (2007).

<sup>32</sup> The label “endowment effect” commonly has been used to refer to observed asymmetries. See Thaler (1980). Using this label to refer to the observed phenomenon is problematic because, in addition to acting as a label for the observation, it suggests a particular theory to explain the observation. In particular, use of the label implies that a particular form of preferences causes the asymmetry. Using “endowment effect theory” to refer to the theoretical explanation distinguishes it from the observed phenomenon, which is better referred to as the “WTA-WTP gap” or “exchange asymmetry.”

<sup>33</sup> Raban, Daphne R. and Sheizaf Rafaeli “Subjective Value of Information: The Endowment Effect.” E-Society Proceedings of the 2003 IADIS conference IADIS e-Society 2003, pp. 392-401; List, John A. 2006 “Using Hicksian Surplus Measures to Examine Consistency of Individual Preferences: Evidence from a Field Experiment.” *Scandinavian Journal of Economics*, 108(1):115-34; Christine M. Jolls, *Behavioral Law and Economics*, in Peter Diamond, ed. *Economic Institutions and Behavioral Economics*. Princeton: Princeton University Press (2005).

<sup>34</sup> Knetsch (1989, AER).

<sup>35</sup> Knetsch (1989, AER) [pin cite]

<sup>36</sup> See Korobkin (NW Law Rev 2003) (summarizing posited explanations and emphasizing the importance of discovering which theory best organizes the data before applying the theories in legal analyses).

<sup>37</sup> cite

<sup>38</sup> cite to experimental lit demonstrating that wealth effects do not account for disparity.

suggested that gaps can be explained by regret avoidance.<sup>39</sup> This theory rests on two assumptions: (1) lost utility from regretting a “bad” decision to trade is greater than the lost utility of regretting a “bad” decision not to trade, and (2) lost utility from regretting a “bad” decision is greater than utility gained from reveling in a “good” decision.<sup>40</sup> Third, others have argued that subjects might value endowed goods differently because they experience psychological attachment to endowed goods.<sup>41</sup> This explanation differs from endowment effect theory because it does not adopt loss aversion as the driver behind observed gaps; rather, it posits that entitlement to a good transforms the nature of the good so that the good is more valuable as the holder enjoys entitlement. Although it is important to recognize that these and other alternative theories have been forwarded to explain gaps, legal commentators cite endowment effect theory as the leading theory. Thus, this Article focuses on endowment effect theory and its application to law.

Despite claims to the contrary,<sup>42</sup> there is no consensus in the economics literature about the nature, robustness and cause of observed WTA-WTP gaps and exchange asymmetries. Several experimental studies report significant gaps while others report no gap. This mix of results motivated two new studies that investigate the influence of experimental procedures on whether a gap is observed.

#### B. Recent Evidence and Interpretations

Two recent studies call into question common interpretations of WTA-WTP gaps and exchange asymmetries as support for endowment effect theory. The first study focuses on procedures used in studies that measure gaps by eliciting subjects’ valuations as buyers and sellers. The second study looks more closely at the procedures employed in experiments in which subjects are endowed with one good and asked if they wish to trade the good for an alternate good. The results from both studies support the claim that gaps and exchange asymmetries are artifacts of the experiments’ designs. The predictions of endowment effect theory are not supported by the data.

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<sup>39</sup> See Russell Korobkin, *Inertia and Preference in Contract Negotiation: The Psychological Power of Default Rules and Form Terms*, 51 *Vand. L. Rev.* 1583, 1610-26 (1998).

<sup>40</sup> Korobkin, *NW* 2003 at 1254.

<sup>41</sup> Ortona and Scacciati, *New Experiments on the Endowment Effect*, 13 *Journal of Economic Psychology* 277, [pin] (1992); Cass R. Sunstein, *Legal Interference with Private Preferences*, 53 *Chicago Law Review* 1129, 1151 (1986); Thomas F. Cotter 1997, 62; Jeffrey J. Rachlinski and Cynthia R. Farina, *Cognitive Psychology and Optimal Government Design*.” 87 *Cornell Law Review* 549, 605 (2002); Lee Anne Fennell, *Revealing Options*, 118 *Harvard Law Review* 1399, fn. 107 (2005).

<sup>42</sup> cite

1. Evidence: WTA-WTP Gaps and Subject Misconceptions

At the same time that experimenters were exploring the nature and robustness of WTA-WTP gaps, they also implicitly (and sometimes explicitly) devised methods to control for a variety of possible alternative explanations. We can separate these controls into five categories. First, some studied the influence of using market mechanisms<sup>43</sup> and incentive-compatible mechanisms to elicit valuations.<sup>44</sup> An incentive-compatible mechanism is designed to elicit valuations devoid of strategic considerations and other external influences. To achieve incentive compatibility, experimenters use mechanisms that provide subjects an incentive to reveal valuations devoid of external influences.<sup>45</sup> They also require subjects to make binding (as opposed to hypothetical) decisions that influence how much money they receive at the end of the experiment.<sup>46</sup>

Gordon M. Becker, Morris H. DeGroot, and Jacob Marschak designed one such mechanism in the early 1960s.<sup>47</sup> When subjects are in the role of buyer, the mechanism works as follows.<sup>48</sup> Each potential buyers' bid is compared to a randomly generated number, announced after all bids are

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<sup>43</sup> David S. Brookshire and Don L. Coursey, Measuring the Value of a Public Good: An Empirical Comparison of Elicitation Procedures, 77 *American Economic Review* 554 (1987) (finding that the gap's magnitude is significantly reduced when market mechanisms are used to elicit valuations).

<sup>44</sup> David S. Brookshire, Don L. Coursey and Karen M. Radosevich, Market Methods and the Assessment of Benefits: Some Further Results, in *Amenity Resource Valuation: Integrating Economics with Other Disciplines*, eds. George L. Peterson, B.L. Driver and Robin Gregory. Venture Publishing, Inc. State College, PA (1988) ("Without the addition of a market-like elicitation procedure that induces truthful revelation of value, the gap and associated asymmetry between WTP and WTA measures should not be expected to disappear.")

<sup>45</sup> See e.g., Coursey, Hovis and Schulze, The Disparity Between Willingness to Accept and Willingness to Pay Measures of Value, 102 *Quarterly Journal of Economics* 679 (1987) (employing a Vickrey auction to provide incentive for subjects to announce valuations devoid of external influences); but see Jack L. Knetsch, Fang-Fang Tang and Richard H. Thaler, The Endowment Effect and Repeated Market Trials: Is the Vickrey Auction Demand Revealing?, 4 *Experimental Economics* 257 (2001) (finding that in some contexts Vickrey auctions are not incentive compatible).

<sup>46</sup> See e.g., Jack L. Knetsch and J.A. Sinden, Willingness to Pay and Compensation Demanded: Experimental Evidence of An Unexpected Disparity in Measures of Value, 99 *Quarterly Journal of Economics* 507 (1984) (observing significant gaps even after presenting subjects with binding decisions that resulted in possible cash compensation); Harless, *Journal of Economic Behavior & Organization* (1989) (using binding second-price auctions).

<sup>47</sup> Becker, DeGroot, and Marschak. *AER* 1963.

<sup>48</sup> The mechanism works in a similar fashion when subjects are in the role of seller.

placed. If the bid is higher than (or equal to) the random number, the subject buys the good and pays an amount equal to the random number. If the bid is lower than the random number, the subject does not buy the good and keeps his money. The bidder maximizes his profits by announcing his true value for the good (i.e., the amount of money that makes him indifferent between the money and the good). If he announces some number higher than his true value, and the random number falls between his true value and his announced valuation, then he must buy the good for an amount higher than his true value. Alternatively, if he announces some number lower than his true value, and the random number falls between his true value and his announced valuation, then he passes up the chance to purchase the good for some amount lower than his true value. By utilizing this mechanism to elicit valuations, the experimenter encourages subjects to announce valuations independent of strategic considerations triggered, for example, by competing with other subjects for the opportunity to transact.

Second, some experimenters expressed concern that subjects might be unfamiliar with the market context or incentive-compatible mechanism used to elicit valuations.<sup>49</sup> To control for this, experimenters sometimes provide training on the operation of the mechanism. Some simply announced that it was in the subjects' best interests to report "true valuations."<sup>50</sup> Some explained to subjects the optimal strategy of revealing true valuations.<sup>51</sup> Some went as far as providing subjects with a detailed explanation of the mechanism along with numerical examples of how reported valuations influence payouts.<sup>52</sup> Sometimes explanations were provided and then

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<sup>49</sup> David S. Brookshire, Don L. Coursey and William D. Schulze, Experiments in the Solicitation of Private and Public Values: An Overview, in *Advances in Behavioral Economics*, Vol. 2, ed. Leonard Green and John H. Kagel, Norwood, NJ: Ablex Publishing, at 173-190 ("If respondents treat the contingent valuations as an auction of a good that is not clearly understood...and in a market context that is unfamiliar..., then a logical strategy is to adopt an initial bargaining position with extreme initial bids." quote at 176).

<sup>50</sup> Coombs, Bezermbinder and Goode, *J of Mathematical Psychology* (1967); Kahneman, Knetsch and Thaler, [title], *Journal of Political Economy* (1990); Loewenstein and Issacharoff, [title] *JBDM* (1994); List and Shogren [title] *Amer J Agr Econ* (1999); Shogren, Cho, Koo, List, Park, Polo, Wilhelmi [title] *Resource and Energy Economics* (2001). The use of the term "true valuation" is meant to convey valuations uninfluenced by strategic considerations introduced by the elicitation mechanism.

<sup>51</sup> Harless, *Journal of Economic Behavior & Organization* (1989) (studying the effects of explaining the optimal strategy of the incentive-compatible mechanism to subjects; [report findings; add detail about training]; Knetsch, *American Economic Review* (1989) (providing detailed explanation to subjects and dismissing groups if 25% or more failed a quiz to test for understanding); Ortona and Scacciati, *JEP* (1992).

<sup>52</sup> Brookshire and Coursey, *American Econ. Rev.* (1987)

subjects were tested for understanding.<sup>53</sup> In addition, some experimenters explained to subjects how to determine their true valuations.<sup>54</sup> While the procedures differed in approach, they were all used with one goal in mind: to increase understanding of the elicitation device and therefore the likelihood that subjects report valuations independent of strategic considerations.

Third, some experimenters provide subjects an opportunity to practice using the elicitation mechanism and to ask questions. Practice was often provided in the form of unpaid rounds similar to the subsequent paid rounds used to measure valuation asymmetries.<sup>55</sup> The purpose of practice rounds is to allow subjects to familiarize themselves with the elicitation mechanism so that noise due to error is minimized when experimenters elicit actual valuations used to measure WTA-WTP gaps.

Fourth, experimenters often provide subjects with *paid* practice rounds to provide subjects with experience using the elicitation device before eliciting valuations used to measure the gap.<sup>56</sup> Unlike unpaid practice rounds, paid practice rounds are more likely than unpaid practice rounds to reinforce the behavior of subjects who announce non-strategic valuations and punish those who mistakenly (or purposefully) respond non-optimally. The idea is that paid practice rounds more effectively promote learning so that, by the time subjects participate in the round that produces data used to measure WTA-WTP gaps, they understand that announcing non-strategic valuations will maximize their payouts.

Fifth, some have argued that subjects who believe that their responses will be revealed to other subjects or to the experimenter might use the opportunity to signal something about their personal characteristics to others. For example, Fremling and Posner suggest that subjects might increase the minimum amount of money they would be willing to accept to give up an

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<sup>53</sup> Bateman, Munro, Rhodes, Starmer, Sugden, *Quarterly J of Econ.* (1997); Knetsch, Tang and Thaler, *Experimental Econ* (2002) (instructing "it is in your best interest to indicate your true WTA/WTP in each round"; providing specific instructions on the market mechanism and administering two questions to test for understanding).

<sup>54</sup> Cites.

<sup>55</sup> Coursey, Hovis and Schulze, *The Disparity Between Willingness to Accept and Willingness to Pay Measures of Value*, 102 *Quarterly Journal of Economics* 679, 684 (discussing importance of providing practice rounds and providing four non-binding trial rounds); Knetsch, *American Economic Review* (1989) (providing one hypothetical round prior to actual measurements of valuations); Kahneman, Knetsch and Thaler, *Journal of Political Economy* (1990) (providing hypothetical rounds for practice and to gauge understanding); Boyce, Brown, McClelland, Peterson and Schulze, *American Economic Review* (1992) (providing ten unpaid practice rounds before one binding round). Arlen, Tally and Spitzer, *Journal of Legal Studies* (2002) (providing two practice rounds with a test for understanding).

<sup>56</sup> Franciosi, Kujal, Michelitsch, Smith and Deng, *Journal of Economic Behavior & Organization* (1996) (providing paid induced-value token rounds to train subjects on the elicitation mechanism)

endowment to signal to others that their time is valuable.<sup>57</sup> One might imagine other signals subjects might attempt to send to their fellow subjects, which might move revealed valuations either up or down. For example, if the subjects perceive the endowed good as a gift from the experimenter, they might ask for more than they would otherwise as a way to signal gratitude for or appreciation of the “gift.” Controlling for signaling opportunities in the laboratory is quite simple; double-blind experiments ensure that neither the subjects nor the experimenter will learn the revealed valuations or individual subject payouts.<sup>58</sup>

Table 1 summarizes the controls commonly used in WTA-WTP gap experiments to remove influences that might compel subjects to report something other than the maximum amount they would pay as buyers and the minimum amount they would accept as sellers. Some experimenters use only one of the controls, while others use several to remove confounding factors. The lack of one or more of the controls in previous designs was the impetus for the new studies.

With these controls in mind, Plott and Zeiler designed an experiment to test an alternative theory against endowment effect theory as an explanation for observed gaps.<sup>59</sup> The motivation behind the design is simple. To test endowment effect theory, experimenters must measure the gap devoid of strategic considerations and misconceptions about how revealed valuations map into outcomes. This can be quite difficult. Mechanism designers have toiled to construct truth-revealing mechanisms for this very purpose.<sup>60</sup> While the mechanisms are clever and elegant to an economist’s trained eye, the typical experiment subject might find them unwieldy and mysterious. Moreover, because they are not commonly used in actual markets, most subjects who participate in WTA-WTP gap experiments likely are unfamiliar with them. Given this, it seems reasonable to suspect that subjects’ misconceptions about how their reported valuations affect how much money they will walk away with at the end of the experiment might lead them to revert to their basic market instincts: sell high and buy low. Therefore, the study set out to test the following conjecture: Are gaps the result of subject misconceptions about how their responses map into outcomes?

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<sup>57</sup> Fremling and Posner, Working paper. The authors posited that, by stating a high WTA, a subject could signal that the effort she would have to expend to obtain a replacement good would be very costly because her time is highly valuable. [pin cite]

<sup>58</sup> Knetsch and Sinden (QJE, 1984); Brookshire and Coursey (AER, 1987); Shogren et al. (AER, 1994); Knetsch, Tang and Thaler (Experimental Econ, 2002); Arlen, Spitzer and Talley (JLS, 2002). [add parentheticals]

<sup>59</sup> Charles R. Plott and Kathryn Zeiler (2005)

<sup>60</sup> [cite to mechanism design literature; specifically truth-revealing auctions or refer to section in Mas-Collell on this topic].

Table 1: Summary of experiment controls employed to eliminate confounders when measuring WTP-WTA gaps

<b>Control</b>	<b>Purpose</b>	<b>Examples</b>
Incentive-compatible mechanism	To provide incentives for subjects to report true valuations	Coursey, et al. (QJE, 1987) Knetsch and Sinden (QJE, 1984)
Training	To increase understanding of elicitation device and optimal strategy	Harless (JEBO, 1989) Kahneman et al. (JPE, 1990) Knetsch (AER, 1989)
Practice/coaching	To provide experience with the elicitation mechanism	Boyce et al. (AER, 1992) Arlen et al. (JLS, 2001?)
Paid practice	To provide subjects with paid practice, focus attention and increase understanding	Franciosi et al. (JEBO, 1996)
Anonymity	To eliminate incentives to deviate from true valuations in order to signal personal characteristics to others	Knetsch and Sinden (QJE, 1984) Brookshire and Coursey (AER, 1987) Shogren et al. (AER, 1994)

Note: QJE = Quarterly Journal of Economics; JEBO = Journal of Economic Behavior & Organization; JPE = Journal of Political Economy; AER = American Economic Review; JLS = Journal of Legal Studies

With this conjecture in mind, the study identifies a set of controls experimenters employ to eliminate subject misconceptions that might lead to confounded valuation measurements. The new experiment implements the union of the controls collected from previous studies.<sup>61</sup> First, valuations were elicited using an incentive-compatible mechanism (i.e., the Becker, DeGroot, Marschak mechanism) to encourage subjects to announce their non-strategic valuations. By making subjects' decisions binding—coffee mugs were actually exchanged for money and vice versa—subjects had an incentive to maximize potential earnings. Second, in an attempt to control for misconceptions subjects might have about how the mechanism works, they were trained on how to determine the most they would pay as buyers and the least amount they would accept as sellers. They also received training on exactly how the mechanism maps reported valuations into payoffs. Subjects were walked through examples illustrating why reporting non-strategic valuations was the optimal strategy. Third, subjects participated in two non-binding practice rounds using lotteries with cash outcomes during which they were encouraged to ask questions. Fourth, prior to measurement of the gap, the subjects participated in fourteen paid practice rounds using lotteries to

<sup>61</sup> Plott and Zeiler AER (2005) pp. 537-38.

develop a better understanding for the mechanism and to allow for learning from actual rewards and losses. Fifth, all decisions and payouts were made anonymously. This alleviated concerns that subjects might gravitate away from their true valuations in order to signal some personal characteristic to other subjects.<sup>62</sup>

The procedures were designed to test for whether observed gaps support endowment effect theory or whether gaps are attributable to alternative explanations such as subject misconceptions and classical preference theories that find influence through experimental procedures. Endowment effect theory predicts that sellers will ask for more than buyers will bid. Therefore, the controls should have no effect on the results as long as they leave in tact all necessary conditions for endowment effect theory to apply (e.g., entitlements are present). If, on the other hand, the alternative theory related to procedures drives observed gaps, then controlling for the confounding effects of the procedures should eliminate the gap.

The results strongly support the conjecture that procedures and subject misconceptions drive observed WTP-WTA gaps.<sup>63</sup> When an incentive-compatible mechanism is employed, training on the mechanism is provided, subjects engage in paid practice rounds, and decisions are anonymous, no gap is observed. To test for whether paid practice rounds are necessary to eliminate the gap, in one treatment subjects were trained and participated in two unpaid practice rounds, but not the 14 paid practice rounds. Eliminating these rounds did not change the results: no gap was observed.<sup>64</sup>

## 2. Evidence: Exchange Asymmetries and Classical Preference Theories

In a second set of experiments, we investigated whether procedures might also explain observed asymmetries in simple exchange experiments.<sup>65</sup> As described above, in these experiments subjects are endowed with one good and asked to raise their hands if they wish to trade the good they own for an alternate good. Given the simplicity of the procedures, subject misconceptions most likely are not behind observed asymmetries. Therefore, we designed a set of experiments to determine whether procedures do play a role despite the fact that they likely do not lead to misconceptions about how choices influence outcomes.

In this study, we examined four different features of the conventional exchange experiment design. First, we tested whether the placement of the

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<sup>62</sup> Some have suggested that subjects might state high valuations as sellers to signal their prowess as bargainers. See e.g., Gertrud M. Fremling and Richard A. Posner. *Signaling*. 2004.

<sup>63</sup> Plott and Zeiler *AER* 2005 p. 540.

<sup>64</sup> Plott and Zeiler *AER* 2005 p. 540.

<sup>65</sup> Plott and Zeiler. *AER* 2007.

endowed good at the time of choice influences choices. We conjectured that placement might signal something to the subjects about the relative value of the goods. In other words, we wondered whether subjects might read into the fact that the experimenter placed one good within reach while the other good was merely passed around from one subject to the next for inspection. To test for this possibility subjects made choices with both goods immediately in front of them.<sup>66</sup>

Second, we tested whether the experimenter's involvement in the choice of which good to endow affects subject choices. Our conjecture was that the subjects might view the endowment as a gift from the experimenter. This perception might prompt subjects to favor the endowed good over the alternate good. In addition, subjects might infer something about the relative value of the goods from the experimenter's choice of which good to endow. To test for this we randomly determined which good to endow.

Third, we tested whether collecting choices using raised hands affects subjects' choices. In early pilots, we noticed that subjects seem to be using other subjects' choices as information about whether to trade. In fact, subjects reported to us that they considered others' choices. By allowing subjects to view other subjects' choices, attention might be shifted away from one's own preferences to a determination of the "right" answer or how one will be perceived by the other subjects. To control for these confounders, we gathered choices using forms rather than raised hands.

Fourth, we tested whether the experimenter's purposeful and repeated emphasis on ownership influences choices. Because these experiments focus on the influence of ownership on valuation, the experimenter must be confident that subjects understand they own one of the goods. To do this, experimenters might communicate this fact by repeating the message in a variety of ways (e.g., "The mug is yours. I'm giving it to you. You own it."). While repetition can be an effective method for increasing the transfer of information, using this method in exchange experiments might inadvertently influence choices by signaling relative value. Subjects might infer too much from the experimenter's repeated message. To test for this, we simply eliminated repetition of the message while at the same time taking steps to ensure that subjects understood they owned the endowed good.

By implementing these controls we were able to test for whether endowment effect theory explains observed exchange asymmetries or whether experimental procedures give rise to observed asymmetries. Despite several manipulations to the procedures, one feature of the design remained constant over all treatments: entitlement to one of the goods. Therefore, endowment effect theory predicts we would observe a significant asymmetry

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<sup>66</sup> In a more extreme treatment, subjects made choices while the alternate good was immediately in front of them and the endowed good was placed at the front of the room.

in each treatment. On the other hand if observed asymmetries are attributable to the procedures, when we implement the specified controls we should observe no exchange asymmetry.

Our results support the claim that observed exchange asymmetries are attributable to the experimental procedures. When we incorporated all controls described above, subject choices were not correlated with entitlement.<sup>67</sup> **[add more detail here]**

### 3. Interpretations of Recent Evidence

Despite claims that experimental procedures do not explain observed gaps,<sup>68</sup> the results from these recent experiments support the conjecture that alternative theories that influence reported valuations and choices through experiment procedures better explain gaps and exchange asymmetries than does endowment effect theory.

Some have argued that despite this recent evidence demonstrating that gaps can be made to disappear, the weight of the evidence supports endowment effect theory as an explanation for observed valuation gaps and exchange asymmetries.<sup>69</sup> Specifically, some have argued that many more studies report gaps, and the sheer number of studies finding a gap should give us pause that the most recent studies might be missing something. The theories posited by Plott and Zeiler (2005 and 2007), however, suggest that piling up studies on each side of the scale is not an appropriate way to evaluate the body of evidence. If certain procedures used during the experiments lead to gaps, and these procedures are employed in a large number of experiments, then we would expect that many studies would report gaps. Given the nature of the theoretical explanation related to procedures, counting studies seems an unproductive method of evaluating the strength of the evidence in this case.

**[Add a note to explain that our results do not suggest that prospect theory is wrong on all counts. It might accurately explain behavior in other settings.]**

Some have argued that the laboratory evidence taken as a whole, including recent studies by Plott and Zeiler, demonstrates that the endowment effect is context-dependent.<sup>70</sup> While it is true that in some

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<sup>67</sup> In fact, we found a reverse asymmetry (statistically significant at the 5% level). That is, subjects were somewhat more likely to leave with the alternate good. **[check whether this can be explained by the general preference for mugs and more subjects starting with pens]**

<sup>68</sup> Korobkin, NW article at 1242.

<sup>69</sup> Korobkin, others?

<sup>70</sup> Korobkin (NW 2003 at 1230); check Jolls recent piece.

contexts we observe gaps and in others we do not, this observation does not lead to a clear conclusion about the best explanation for gaps. One option is to introduce context-dependence into endowment effect theory, somehow updating the theory so that it is able to predict gaps and asymmetries conditional on particular contexts. To ensure the theory is falsifiable, one must set out a set of conditions sufficient to produce gaps or asymmetries. This also requires positing plausible connections between the sufficient conditions and features of the theory thought to drive disparities (i.e., reference points and loss aversion). A second option is to examine the contexts for clues about alternate explanations for gaps. The latter option likely is the more fruitful one.

To make this more concrete, consider two examples. First, assume that experimenter involvement in choosing the endowment is shown to influence whether we observe an exchange asymmetry. That is, assume we observe an asymmetry if the experimenter is perceived to choose which good to endow, and that we do not observe an asymmetry if the experimenter is perceived to randomly determine the endowment. The *first option* would prompt us to update endowment effect theory in a way that suggests that experimenter involvement either influences the reference point or increases subjects' sensitivity to loss aversion. The connection does not seem clear. The *second option* suggests using this observation as a clue about alternative explanations for gaps: maybe experimenter involvement changes the nature of the endowment so that subjects are left to compare a good given to them by an authority figure, with whom they might have future dealings, to an alternate good, the choosing of which might offend the giver of the endowment. This conjecture posits that the subjects' choices have nothing to do with reference points and loss aversion but instead are driven by the consequences of rejecting a gift given by an authority figure.

Second, assume that public revelation of choices is shown to influence whether we observe an exchange asymmetry. We observe asymmetries when choices are made publicly, but not when they are made privately. The first option—updating endowment effect theory to account for the effects of contexts—forces us to posit some relationship between the public or private nature of choices, perceived reference points and loss aversion. This entails explaining why, for example, loss aversion is triggered or is more acute when subjects make public choices. Again, the connection seems unclear. The second option seems like less of a stretch. Specifically, it seems more plausible to posit that exchange asymmetries in the presence of public choices are caused by cascades triggered by the signals subjects' raised hands send about the “right choice” or relative value of the goods.

The next question is: what are the implications of the recent findings on legal applications of endowment effect theory? The purpose of the next Part is to revisit legal analyses that apply endowment effect theory to make descriptive or normative claims.

## II. APPLICATION TO LEGAL THEORY

In 1995, legal commentators started importing theoretical explanations for WTA-WTP gaps and exchange asymmetries into positive and normative legal analyses.<sup>71</sup> To date, over 680 law review articles refer to the endowment effect.<sup>72</sup> Endowment effect theory has been applied both to explain observed phenomenon and to make normative claims about how the law should account for the impact of reference points and loss aversion on behavior. The purpose of this Part is to revisit these applications to exam how they might be impacted by the recent empirical results suggesting observed gaps and asymmetries are not explained by endowment effect theory but rather by alternative theories that find influence through experiment procedures used to endow subjects with goods and to elicit valuations and choices. Before revisiting some of these applications, however, this Part begins by clearing up some misapplications of endowment effect theory in legal scholarship.

### A. Misapplications of Endowment Effect Theory

#### 1. Endowment effect theory does *not* support legal protection of the status quo

One of the most popular normative applications of endowment effect theory in legal scholarship suggests that policymakers should give special weight to the status quo.<sup>73</sup> These applications posit that when the status quo is upset (e.g., the law requires the giving up of some entitlement), loss aversion leads to disutility separate from that suffered by the loss of the value of the entitlement. So, in addition to the loss of the entitlement's value, policymakers should consider the extra disutility entitlement losers experience as a result of loss aversion. This consideration leads to the conclusion that law should give substantial weight to the status quo.

In a recent concurring opinion published by the 10<sup>th</sup> circuit Court of Appeals,<sup>74</sup> the court made such an argument. The case involved members of a religious organization who brought an action against the U.S. seeking a

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<sup>71</sup> Stake, Jeffrey E. 1995. "Loss Aversion and Involuntary Transfers of Title," in Robin Paul Malloy and Christopher K. Braun, eds., *Law and Economics: New and Critical Perspectives. Critic of Institutions*, Vol. 4. Peter Lang Publishing.

<sup>72</sup> A Westlaw search in the "journals and law reviews" database conducted on December 20, 2007 using the search term "endowment effect" produced over 680 hits.

<sup>73</sup> Cites.

<sup>74</sup> *Uniao Do Vegetal v. Ashcroft*. To date, I have discovered only one other opinion that mentions "endowment effect." This suggests the theory has not permeated judicial opinions as deeply as it has legal scholarship.

preliminary injunction to enjoin the government from enforcement of the Controlled Substances Act as it pertained to importation, possession, and distribution of hoasca for religious ceremonies. Hoasca is a liquid tea-like mixture made from certain plants indigenous to Brazil. One of the plants contains a substance listed on Schedule I of the Act.

A federal district court granted the preliminary injunction, and the government appealed. The Tenth Circuit affirmed the granting of the injunction, but a majority of the court also held that a party seeking a preliminary injunction that alters the status quo must satisfy a heightened burden. In a concurring opinion, Judge McConnell agreed with the heightened burden, arguing in part that the court should protect the status quo because we now know from social science research that individuals value already-possessed goods more than prospective acquisitions. In the court's words:

“Notwithstanding the tendency of those trained in economics to view opportunity costs as equivalent to actual expenditures, modern social science research has confirmed the reality of 'loss aversion' (the tendency to attach greater value to losses than to foregone gains of equal amount) and the closely related 'endowment effect' (the tendency to value already possessed goods more than prospective acquisitions).”<sup>75</sup>

This argument rests on a faulty assumption. To argue that endowment effect theory suggests the law should take steps to protect the status quo, one must assume that, absent loss aversion, the parties value the right the same. In other words, the claim that the law should protect the status quo assumes that the disutility experienced from losing an entitlement leads to a high valuation relative to the other party. This assumption, however, fails to recognize that endowment effect theory makes predictions about *intrapersonal* differences in valuation conditional on entitlement. The impact of loss aversion on the minimum amount one would be willing to accept to give up an entitlement does not suggest that valuations of owners always exceed valuations of non-owners (just as the phenomenon of diminishing marginal utility of wealth does not suggest that wealth redistribution would

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<sup>75</sup> citing Daniel Kahneman, Jack L. Knetsch & Richard H. Thaler, The Endowment Effect, Loss Aversion, and Status Quo Bias, 5 J. Econ. Persp. 193 (1991); Amos Tversky & Daniel Kahneman, Loss Aversion in Riskless Choice: A Reference-Dependent Model, 106 Q.J. Econ. 1039 (1991); Daniel Kahneman et al., Experimental Tests of the Endowment Effect and the Coase Theorem, 98 J. Pol. Econ. 1352 (1990); Jack L. Knetsch & J.A. Sinden, Willingness to Pay and Compensation Demanded: Experimental Evidence of an Unexpected Disparity in Measures of Value, 99 Q.J. Econ. 507, 512-13 (1984).

increase total social utility<sup>76</sup>). At most, the presence of loss aversion should compel us to account directly for any disutility stemming from losses of entitlements.

The (incorrect) assumption that we can make interpersonal comparisons might stem from the fact that many of the experimental studies reporting gaps and asymmetries are between-subject designs as opposed to within-subject designs. Between-subject designs ask subjects to value a good only in one role (i.e., as buyer or as seller). Gaps are identified by measuring the difference between reported WTA responses from one subject group and reported WTP responses from another subject group. If subjects are randomly assigned to the groups, other potential explanations for differences in valuations are controlled.<sup>77</sup> Within-subject designs, on the other hand, ask subjects to value a good twice, once as a seller and once as a buyer. Gaps and asymmetries are then measured by averaging the differences between each subject's valuation as seller and buyer. This design eliminates the possibility that some other variable explains gaps (e.g., even when experimenters randomly distribute subjects into groups, distributions of relevant characteristics might not end up being similar across groups). Despite this disadvantage, between-subject designs often are used so that the role subjects play as buyers does not influence the role they place as sellers. Other research suggests that subjects strive to act consistently during experiments,<sup>78</sup> and this might swamp the impact of loss aversion on reported valuations. The use of between-subject designs, however, might give the impression that applications of endowment effect theory can employ interpersonal comparisons.

For obvious reasons, however, this is not the case. In the field, individuals are not randomly distributed into groups with and without entitlement. In fact, owners likely select themselves into ownership status because, on average, they value the good more than non-owners on average.<sup>79</sup> In cases in which entitlements are granted by law, interests are developed around these entitlements. Investments made conditional on the structure of legal entitlements create value for entitlement-holders. For these reasons, absent the ability to randomly distribute individuals into groups, testing endowment effect theory in the field requires measuring an individual's value as an owner, and then somehow eliminating ownership and measuring the same individual's valuation of the same good at the same

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<sup>76</sup> Cite.

<sup>77</sup> For example, some subjects might value mugs more than pens. By randomly distributing subjects into groups, each group is likely to be comprised of similar distributions of mug-lovers and mug-haters, assuming the sample sizes are large enough.

<sup>78</sup> cites

<sup>79</sup> This, of course, assumes non-binding budget constraints.

time as a potential buyer.<sup>80</sup> Obvious difficulties that make this test virtually impossible account for the fact that gaps and asymmetries have been observed only in the laboratory (or in the field, but under controlled lab-like conditions<sup>81</sup>).

2. Offer-asking gaps are not evidence of endowment effect theory in the field

In a similar vein, some have argued that endowment effect theory explains “sticky” markets, including real estate markets in which few transactions have occurred.<sup>82</sup> More specifically, the claim is that home ownership sets the owner’s reference point, and the owner perceives selling his home as a loss relative to his reference point, which he tries to avoid by asking for more than his true value for the home. This increase in asking prices, the argument goes, explains why a gap between offers and asks exists.

This application is flawed for reasons similar to those discussed in Section 1. As before, the argument fails to recognize that WTA-WTP gaps are defined as *intrapersonal* differences between valuations of one individual in the role of seller and buyer. That buyers seem to have lower valuations than sellers is not evidence of endowment effect theory because this difference is an *interpersonal* difference in valuation.

Of course, if individuals were randomly distributed into two groups—those who own homes and those considering purchasing the homes—then we might be able to claim that offer-asking gaps are attributable to endowment effect theory (assuming owners have not developed some sort of psychological attachment to the home<sup>83</sup>). Random distribution of individuals into houses would control for alternative explanations that might account for

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<sup>80</sup> This is referred to in the field of statistics as the “fundamental problem of causal inference.” Cites.

<sup>81</sup> See John List (baseball card experiment; this is a quasi-field experiment in that it employs controlled experimental techniques in the field to measure valuations of a particular subject group (i.e., experienced baseball card traders and inexperienced traders attending a trade show)). See also hunter permit experiments.

<sup>82</sup> cites

<sup>83</sup> Attachment theory is another alternative explanation for observed gaps and asymmetries. Attachment theory is unrelated to reference points and loss aversion. Rather, it posits that ownership changes the perceived nature of the good in the eyes of the owner. For e.g., one might develop an attachment to a home in which one’s children were raised. The changed nature of the good is what accounts for valuation disparities. See e.g., Cass R. Sunstein, *Legal Interference with Private Preferences*, 53 *University of Chicago Law Review* 1129, 1151 (1986); Thomas F. Cotter, *Pragmatism, Economics, and the Droit Moral*, 76 *North Carolina Law Review* 1, 62 (1997); Jeffery J. Rachlinski and Cynthia R. Farina, *Cognitive Psychology and Optimal Government Design*, 87 *Cornell Law Review* 549, 605 (2002); and Fennell, Lee Anne, *Revealing Options*, 118 *Harvard Law Review*, 1399, fn.107 (2005).

differences in valuation between owners and non-owners. That individuals are *not* randomly distributed into potential seller and potential buyer groups opens the door for a potential alternative explanation for sticky markets (e.g., higher interest rates, tighter credit markets, etc.).

Again, to determine whether endowment effects exist in real estate markets, we would somehow have to measure valuations of owners given they no longer owned the house but had the same wealth. Our inability to rule out alternative explanations given confounding selection effects precludes us from concluding that endowment effect theory explains sticky markets. In addition, endowment effect theory cannot explain why real estate markets are sometimes sticky and sometimes active.

### 3. Others?

[insert others]

Putting these misapplications to one side, we can consider next how the recent experimental results impact more robust legal applications of endowment effect theory. In general, the new results suggest that we should worry less about possible disutility created by losses of entitlements.

#### B. Revisiting endowment effect theory applications

**[In this section, I plan to categorize the myriad legal applications of endowment effect theory. I will then pick two or three representative applications to demonstrate how endowment effect theory has been applied in both normative and descriptive analyses. The following subsections lay out some possible examples. Generally, I will argue the new results suggest we need not concern ourselves with the impact of reference point dependence and loss aversion.]**

#### 1. Normative Claims: When should the court apply property rules as opposed to liability rules?

Jeffrey J. Rachlinski and Forest Jourden were among the first to apply endowment effect theory to make normative claims about whether courts should employ property rules (e.g., injunctive remedies) or liability rules (e.g., damages remedies).<sup>84</sup> In their article, the authors describe a nuisance suit in which plaintiff-homeowners win monetary damages, but then appeal the remedy, arguing that they were entitled to injunctive relief, which would preclude the defendant-polluter from causing further damage to the

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<sup>84</sup> Vanderbilt LR 1998. [add pin cites throughout this section].

plaintiffs' homes. The purpose of the article is to explore why the plaintiffs would expend resources to return to court to seek a different type of remedy.

They begin by ruling out two rational choice theoretic explanations for the observed behavior of the plaintiffs. First, rational choice theory might predict that the plaintiffs preferred the court to apply a property rule so that they could bargain with the defendant-polluter to obtain a settlement in excess of the damages award. The authors dismiss this theory, arguing that the plaintiffs unlikely were trying to obtain the upper hand in negotiations because they did not appeal the size of the damages award. Second, rational choice theory predicts that the plaintiffs would appeal if awarded damages, calculated using market prices, were less than the diminished home values caused by the pollution. The authors also dismiss this theory, suggesting that the court, at least, did not believe the plaintiffs were trying to extract a large settlement; rather it seemed more concerned that the homeowners' pursuit of injunctive relief was an attempt to shut down an important employer in the community.

After dismissing these rational choice theory explanations, the authors argue that endowment effect theory better explains the plaintiffs' behavior. Specifically, they posit that individuals perceive that ownership comes with the ability to stop polluters from diminishing the value of their homes. By refusing to grant injunctive relief, the court threatened to take away the plaintiffs' ability to sell this right to the polluter, undermining their status as owners. Therefore, endowment effect theory predicts that the plaintiffs will pursue an appeal if the value of the entitlement plus the expected disutility avoided by the court's extraction of the entitlement exceeds the value of the damages remedy.<sup>85</sup>

More generally, they argue that courts should consider the fact that injunctive remedies create endowment effects. Specifically, they argue that "a right that is protected by a damages remedy might convey less of a sense of ownership than does a right that is protected by an injunctive remedy." This implies that the Coase Theorem fails because it assumes that WTP is equivalent to WTA. If an injunctive remedy sets the owner's reference point and makes possible a loss of the entitlement, to which owners are averse, then the outcome might depend on the legal rule. And so, if property rules increase home owners' WTA due to loss aversion, courts must determine the parties' levels of loss aversion so it can get the right into the hands of the party that values it the most.

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<sup>85</sup> Note that Rachlinski and Jourden also report the results from an experiment they ran to test their hypotheses. [**describe experiment design here and summarize results....they observe a gap.**] The design, however, suffers from the same control issues investigated by Plott and Zeiler (2005). Therefore, it is difficult to know what to make of the results.

Now, how do we bring the new empirical developments into the picture? If loss aversion does not explain observed gaps in the laboratory or controlled field, the only environments in which we observe gaps, then we may not have to concern ourselves so much with loss aversion when determining whether to use a liability rule or a property rule. The new results suggest courts need not be concerned with the impact of reference point dependence and loss aversion when choosing between property rules and damages rules. Rather we should focus on other considerations that have been mentioned by Rachlinski and Jourden and in the larger literature (e.g., hold out problems, etc.).

To satisfy those who argue that the new results suggest endowment effect theory is context-dependent, we should compare the legal context of remedy determinations to the laboratory contexts in which gaps are observed. A claim that this legal context includes sufficient conditions to trigger endowment effects would require drawing parallels from the experiment environments to contexts in which judges make remedy determinations. More specifically, the claim would require arguing that the legal context is more similar to experiment designs that produce gaps. The comparison, however, produces few similarities—for example, physical proximity, public choices and methods of entitlement and third-party involvement in the choice of which good to endow do not play a role.

## 2. Descriptive Claims: What explains the court's behavior in affirmative action cases?

In addition to using endowment effect theory to support normative claims about how the law should be structured, the theory has been used to explain observed behavior by legal actors. **[list a few examples here]**

Ian Ayres and Frederick Vars use endowment effect theory to explain courts' mixed responses to affirmative action plans.<sup>86</sup> They begin by citing cases to demonstrate that courts seem more likely to uphold restructured hiring goals as a method to implement affirmative action plans than they are to uphold layoffs as a way to create diversity in the workplace.<sup>87</sup> Applying endowment effect theory, they posit that courts object to layoffs because employees perceive their jobs as entitlements; therefore, the loss of one's job creates disutility in addition to the actual loss of employment.<sup>88</sup> Courts are more supportive of restructured hiring goals, the argument goes, because they do not involve loss of entitlements.<sup>89</sup>

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<sup>86</sup> 1998 Columbia LR

<sup>87</sup> cite

<sup>88</sup> cite

<sup>89</sup> cite

The sole evidence Ayres and Vars invoke to support their claim is behavior observed in laboratory experiments.<sup>90</sup> The recent experimental results, however, call this evidence into question and suggest endowment effect theory is not driving judges' actions in these cases. If endowment effect theory does not work to explain the observed phenomenon, however, what might explain it?

At first blush, it could be argued that courts' preferences are driven by the same phenomenon that might drive sticky markets—namely, those currently holding jobs value them the most because they selected themselves into their particular positions. If we believe, however, that discrimination plays a role in the matching of employees to jobs, we can no longer assume the market has placed the highest-value “owners” into each position. Therefore, courts likely are not driven by the assumption that total social welfare will decrease when layoffs are used to implement affirmative action programs, moving those valuing jobs less into higher-value holders' positions.

Given the dissimilarities between laboratory environments and legal contexts in which courts rule on affirmative action programs, the recent experiments seem to have little to offer in terms of potential direct explanations for courts' preferences over affirmative action projects except to suggest that we should consider other theories to explain the observed phenomenon. A number of theories might explain the preference. First, perhaps restructured hiring goals are more attractive to judges than layoffs because they create relatively low transaction costs. Second, courts might prefer restructured hiring goals to layoffs because the former reduce the probability of increased racial tension. Members of the majority who are fired to allow the employer to increase minority representation are likely to discover the impetus for the loss of their jobs. On the other hand, majority members who apply for jobs but lose out to minority members are less likely to connect their lack of success to the employer's affirmative action program.<sup>91</sup>

### III. WHERE DO WE GO FROM HERE?

**[under construction]**

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<sup>90</sup> Ayres and Vars (citing ... as evidence of endowment effect theory).

<sup>91</sup> **[search literature to determine whether commentators have made these arguments or others]**

CONCLUSION

**[under construction]**

**[include word of caution about drawing unsubstantiated conclusions from the new results; we need more replication/investigation before firm conclusions can be drawn]**