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# How Deep Is Your Love? Loss Aversion in Dating Markets

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Every day, millions of people open their computers, unlock their phones and launch dating apps with the hope of finding a perfect match. The thought that one swipe could lead to a lifetime of love entices millions of Americans, more each day, into regularly using dating applications (Finkel, et al. 2). With the number of users rapidly growing, how are these online platforms changing the way people behave in the dating market? In order to better understand the way people value dating opportunities, I examine the “endowment effect” in the dating market. Generally applied to traditional market goods, the endowment effect describes the human tendency to value goods more highly just because they own them. It is generally thought to be a manifestation of “loss aversion,” the human tendency to prefer avoiding losses to acquiring equivalent gains (e.g., it is better to not lose \$10 than to find \$10.)

In any market, the endowment effect reduces transactions, creates inefficiency and prevents the optimal allocation of resources. For example, Genesove and Mayer (2001) studied the housing market by exploring the correlation between the original purchase price of condos and subsequent listing prices when they are resold. Economic theory suggests that original purchase prices should be viewed as a sunk cost, not playing a role in determining future listing prices. Instead, Genesove and Mayer found that there is a strong positive correlation between original purchase price and listing price, driving a wedge between the high prices sellers are willing to accept and the low prices buyers are willing to pay in these markets. This leads to “sticky prices,” which prevent the market from clearing and surplus from being realized.

In the dating market, the endowment effect has the potential to reduce the efficiency of the matching process if people fail to break up with sub-optimal significant others because the looming feeling of loss overwhelms the potential gains from continued search. As far as I can determine, theoretical models on matching markets have not

considered the implications of loss aversion and the endowment effect for efficient matching. However, given strong evidence that these preference asymmetries exist for many different goods it is reasonable to expect that they might be present in dating markets. In fact, recent work by Nataf and Wallsten (2013) provide experimental evidence that the endowment effect exists in the dating market. The objective of this thesis is to build on their work in several different ways.

First, I examine whether the endowment effect exists for dating opportunities by running an online experiment where subjects who are randomly assigned to two different treatments where they are asked for (a) their willingness to accept for parting with a dating opportunity they have been endowed with, or (b) their willingness to pay for the date opportunity if they are in the non-endowment treatment. Next, I examine a key feature of online dating: access to an abundance of available and easily comparable dating opportunities. I hypothesize that when the number of dating alternatives increases, people will value each individual dating opportunity less. I expect the alternatives to help people overcome loss aversion, resulting in a weaker endowment effect in the online dating market. Due to previous research, I also expect women to be more loss averse than men in the dating market. In addition, I expect people who are interested in more casual or short-term relationships to display less loss aversion compared to people interested in more serious or long-term relationships, and for people with less dating experience to display more loss aversion than those with more experience.

If online dating changes how people value individual dating opportunities, it may lead to positive behavioral changes in dating. If online dating reduces the endowment effect, it may enable people to move in and out of relationships more freely, with less friction. People may date more temporarily and have relationships with more people before marriage. Online dating reduces search costs, making it easier to learn a little bit

about a greater number of people. This information may help people find significant others with whom they are more compatible, creating better matches. In addition, if online dating platforms limit friction in the dating market, they may empower more people to leave sub-optimal or even abusive relationships. On the other hand, when the endowment effect diminishes, people may be less willing to sacrifice time and effort to build and retain relationships. The reduced time and effort put into relationships may restrict the enjoyment derived from them, stunting the quality of emotional connections. In addition, the increasing frequency of breakups may create negative externalities in social groups in the form of greater strain on friendships and family relationships. For example, weaker endowment effects could lead to more divorce, negatively affecting the environment in which children are raised.

This study finds that simultaneous access to many dating options does indeed reduce the endowment effect in the dating market. This paper begins with a review of the literature on online dating, loss aversion, and the endowment effect, focusing first on key differences between online dating and traditional dating, followed by the potential psychological causes of the endowment effect. I then synthesize the economic and psychological theories that generate my hypothesis and outline the experimental method used to test it. After discussing the results of the experiment and the potential sources and directions of bias, I close with an analysis of the possible implications of the findings.

## **I. Background**

### *A. Online Dating vs. Traditional Dating*

The emergence of online dating has fundamentally changed the traditional dating market. This change is largely the result of three features of the online dating market that

do not occur naturally in the traditional dating environment: (1) access to many potential romantic partners; (2) the ability to communicate with potential partners before meeting face-to-face; and (3) algorithmic matching of users with potential partners (Finkel, et al. 1). These features contribute to large, well-functioning marketplaces, or online dating sites (e.g. Match.com, OkCupid, Tinder, etc.), where users have access to many other singles with whom they have things in common.

This paper focuses specifically on the first of these three features: access to many dating opportunities. This results from the large number of users who join a particular online dating platform, a key element of any online platform's value proposition. It is argued that access to a large number of opportunities has the potential to influence loss aversion in the dating market. Loss aversion is defined as the widespread human tendency to weigh losses more heavily than equivalent gains. In the context of the dating market, this implies that breakups or the loss of existing dating opportunities is more painful (generates greater dis-utility) than the opportunity for a new relationship is exciting (increases utility). To effectively examine the impact of access on loss aversion in the dating market, it is important to consider the psychological implications of having a multitude of simultaneous, comparable dating alternatives at one's fingertips. These psychological implications are the basis for the theoretical framework of this paper.

### *B. The Psychology of Access*

People evaluate different key traits and prioritize different attributes using distinct cognitive decision processes (Finkel, et al. 32). One of these processes, separate evaluation, occurs when isolated options are presented and evaluated independently, while joint evaluation, occurs when more than one option is presented and users evaluate by comparison (Bazerman, et al. 576). Differences in cognitive decision processes can

drive both differences in preferences and differences in how highly people value dating opportunities. Simultaneous access to many potential dating opportunities, for example, transforms each user's decision process from separate evaluation mode to joint evaluation mode (Finkel, et al. 32). The traits that people prioritize in joint evaluation mode may not be the same traits that create utility when a person experiences a choice outside the context of alternatives (Bazerman, et al. 588). For example, when potential matches are presented simultaneously, one might compare heights, eliminating shorter people from the realm of possibility (Ansari 96). This serves as a natural heuristic for narrowing the pool of options, since comparing height across people is easy. When one option is presented in isolation, however, people give less weight to observable physical characteristics. When considering one option who might be shorter than desired, for example, the evaluator may also discover that the option before them is also friendly and a good listener. Rather than focusing on height alone, a person might focus more on how contact with a potential match makes them feel. The latter attributes are arguably better predictors for longer term happiness in a relationship. Given multiple options, a person might narrow their choices using the height criteria alone, eliminating the possibility of discovering other characteristics that create utility (e.g. friendliness, listening skills, etc.) Therefore, having more options can, in theory, result in lower experienced utility<sup>1</sup> when a face-to-face relationship actually begins (Finkel et al. 32).

It is also possible that considering many profiles is more cognitively difficult and can decrease one's level of interest in any one given profile (Finkel et al. 32). As users browse through many options, for example, engaging in joint evaluation with a comparison-oriented mindset, they may tend to objectify potential partners, seeing them more as commodities, or options in a marketplace, than as unique individuals (Heino, et

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<sup>1</sup> Kahneman (1999) distinguishes between decision utility, which is based on wants and desires at the time of a decision, and experienced utility, which is defined as genuine enjoyment.

al. 444). This objectification diminishes a user's willingness to commit to a single option (Finkel, et al. 29). Carmon, et al. (2003) suggest that a reduced willingness to commit to one option results from the unwillingness to lose alternative options due to developing small attachments to each option through the process of considering them. People are aware that choosing a single person and giving up other alternatives can result in buyer's remorse, or a sense of regret stemming from making the wrong choice, especially when the chosen individual turns out to be disappointing compared to his or her online profile (Heino, et al. 444).

Access to many alternatives may also reframe how users think about fostering relationships. Users focus primarily on sorting through alternatives to *find* the perfect relationship, rather than focusing on ways to *build* the perfect relationship (Heino, et al. 443). Through interviews with a diverse group of online daters, Heino, et al. (2010) discover that many people naturally speak about online dating using metaphors that relate their dating interactions to economic transactions. All subjects are asked these two questions during their interviews: (1) "Has the knowledge that there are thousands of profiles available online changed the way you go about dating? If yes, how?" and (2) "Has it changed the way you view those you might potentially date? If yes, how? (Heino, et al. 433)." They find that people relate online dating to shopping, comparing online platforms to supermarkets and catalogs. They argue that this perception fosters a "search" mentality, as opposed to a "build" mentality, deemphasizing emotional connections and discouraging the development of attachment to a potential partner (Heino, et al 443).

## **II. The Existence of the Endowment Effect**

The endowment effect, or the tendency to overvalue goods purely based on ownership, has been confirmed repeatedly through experimental methods. Variations of



one main experimental approach dominates the large body of literature on the endowment effect. Pioneering this approach, Kahneman, Knetsch, and Thaler (1990) observe the effect through valuation gaps between buyers and sellers. To observe valuation gaps, they randomly split subjects into two groups: sellers and buyers. They give each seller a coffee mug, and ask them to state the lowest price they would be willing to accept (WTA) in order to sell the mug. They leave the buyers empty-handed, and then ask them to state the highest price they would each be willing to pay (WTP) to acquire a mug. The endowment effect exists in the discrepancy between average WTA and WTP, where Kahneman, et. al., found the seller's willingness to accept is, in general, more than twice as high as the buyers' willingness to pay (Kahneman 296). These results are replicated across several other traditional goods, such as binoculars, pens, and chocolate bars (Kahneman, Knetsch, Thaler 1335). Although this method provides robust and replicable results, it relies on people's judgements about their willingness to make exchanges, without actually observing their true behavior. For example, someone might state that \$5 is the lowest price they would be willing to accept for a coffee mug, but then might actually end up selling it for \$4.50. Even so, measuring valuation gaps does effectively quantify the endowment effect, allowing us to compare the effect's magnitude across goods, demographics, and situations.

Valuation gap experiments have also been successfully applied to the dating market, showing that results from experiments administered in traditional markets can be replicated in non-traditional markets. Nataf and Wallsten (2013) study the valuation gap between "buyers" and "sellers" in the dating market using contact information associated with different dating profiles as the good in question. To motivate their experimental design, they cite experiments showing that loss aversion is not limited to traditional markets, such as the market for coffee mugs. Experiments involving the buying and

selling of carbon emissions, wildlife reserves and hunting licenses all demonstrate endowment effects that are larger than those exhibited in traditional market experiments (Nataf and Wallsten 3). Some suggest that the larger WTA/WTP ratios stem from non-traditional markets having more ambiguous pricing than their non-traditional counterparts. These large endowment effects are also explained by variation in the evolutionary salience of the goods. Brosnan and Jones (2008) argue that the endowment effect should be stronger in markets for goods that are more necessary from an evolutionary perspective (Brosnan and Jones 1968). This might not explain the high endowment effect in the markets for carbon emissions and wildlife reserves, but hunting rights and mating choices would seemingly trump all traditional consumer goods markets in terms of evolutionary relevance. Given this line of reasoning, it makes sense that Nataf and Wallsten (2013) observe a large endowment effect in the market for dating opportunities. As this paper builds largely on the work of Nataf and Wallsten, I expect to find a similar result.

Nataf and Wallsten find that the endowment effect does exist in the dating market, but that there are considerable differences in the magnitude of the effect between men and women. Men display similar levels of loss aversion in the dating market as they do in markets for traditional goods (i.e.  $WTA/WTP \approx 2$ ), whereas women display levels of loss aversion around four times higher in the dating market (Nataf and Wallsten 9). Overall, Nataf and Wallsten (2013), provide strong evidence that the endowment effect exists in the dating market. Following their basic design, I created an experiment to test whether the endowment effect differs between people who are presented with many dating opportunities and those who are presented with only one.

### **III. Theories of the Endowment Effect**

Much of the literature surrounding the psychology of online dating suggests that a plethora of options causes people to attribute less value to individual dating opportunities. This effect alone, however, does not imply anything about the magnitude of the endowment effect. If, due to an increase in dating opportunities, both single and matched people devalue dating opportunities to the same degree, the endowment effect would stay the same across traditional and online dating scenarios. This paper examines how a dating market with many options systematically affects both single people, who have a chance to obtain a date, differently from matched people, who have the chance of losing a date. If the presence of many alternatives affects people with different perspectives (single or matched) on the dating market differently, it will affect the magnitude of the endowment effect in the dating market.

The most common and widely accepted explanation for the endowment effect, the hypothesis that people ascribe more value to things merely because they own them, is the idea that people are inherently loss-averse, meaning people weigh the disutility brought about by a loss more heavily than they weigh the utility brought about by an equivalent gain. Chapman, et al. (2017), however, emphasize the importance of other cognitive, emotional, attentional, and social processes involved in both buying and selling in understanding the endowment effect. Their evidence suggests that modeling transactions as gains and losses and attributing the endowment effect to general loss aversion falls unacceptably short of explaining the phenomenon (Chapman, et al. 3). This section synthesizes the economic and psychological theories that explain loss aversion and describes other factors that might contribute to the magnitude of the observed endowment effect. Based on an understanding of these factors, I predict the number of

alternatives will alter psychological processes, resulting in people with many dating alternatives displaying less loss aversion than people with no dating alternatives.

#### *A. Economic Theory*

##### (1) Prospect Theory

Prospect theory, developed by Kahneman and Tversky (1979), aims to describe human decision making under risk. Because prospect theory encompasses several widespread psychological phenomena, including the endowment effect, the theory is consistent with many experimental findings that its predecessor, expected utility theory, fails to explain (Kahneman, Tversky 1041). Two key elements of prospect theory, reference dependence and loss aversion, explain the existence of the endowment effect.

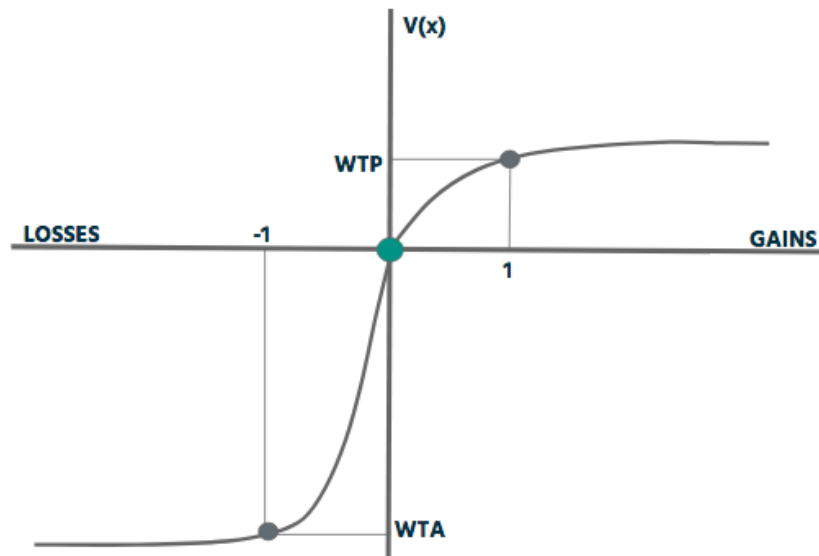
##### *i. Reference Dependence*

Prospect theory (Kahneman 278) claims that people actually judge value based on gains and losses from a reference point, not simply as a function of final states (i.e. total wealth). This reference point usually represents one's "current asset position" (Kahneman, Tversky 274). Illustrated at the origin on the graph below, the reference point reflects the status quo, a person's expectations, and the outcome to which a person feels entitled. A person assesses value, or utility, based not on his/her/their final state, but on how the person's asset position deviates, either positively (gain) or negatively (loss) from his/her/their reference point.

##### *ii. Loss Aversion*

The value curve is kinked at the reference point and is steeper over losses than over gains. This represents the conjecture that people weigh losses more heavily than equivalent gains. The endowment effect is portrayed below by the discrepancy between one's willingness to pay (WTP), defined as the highest price they are willing to pay to

acquire a good, and their willingness to accept (WTA), defined as the lowest price they are willing to accept to sell it. As portrayed in *Figure 1*, WTA, the absolute value of  $V(-1)$  is greater than WTP, the absolute value of  $V(1)$ . This contradicts the neoclassical assumption that mere ownership has no effect on the value of goods or wealth (List 1).



*Figure 1. A diagram of the Value Function, showing reference-dependence and loss aversion.*

While prospect theory has more explanatory power than its predecessor, expected utility theory, it offers no direct prediction for how access to many alternatives or substitutes in a market affects the slope of the value curve. To better understand the nature of loss aversion, it is necessary to explore deeper psychological explanations for the endowment effect.

### *B. Psychological Theory*

Ericson and Fuster (2013) argue that a variety of psychological mechanisms contribute to the endowment effect, including three theories which are instrumental in developing this paper's hypothesis: (1) motivated taste change; (2) attachment; and (3) cognitive perspective. In order to analyze what happens to the magnitude of the

endowment effect when the number of dating options increases, it is important to consider how the number of alternatives affects people on the buying (date acquisition) side and selling (date retention) side differently.

#### (1) Motivated Taste Change<sup>2</sup>

The theory of motivated taste change suggests that people genuinely value objects they own more highly than objects they are not associated with, which makes it more painful to lose an object than it was beneficial to gain it in the first place (Ericson, Fuster 23). One explanation for this effect is that people see possessions as an extension of self, and therefore see their own possessions in a better light due to self-serving biases<sup>3</sup> (Beggan 234). This is potentially relevant in the dating market because evidence suggests the theory of motivated taste change applies not only to objects in a person's possession, but also to people in a person's social circle. For example, Beggan (1992) shows that even being slightly acquainted with another person will inflate one's opinion of that person (Beggan 235). In the online dating market, learning about many alternatives at once may limit the effect of motivated taste change by deflating the extent to which a user values each individual match. This force applies to the selling (date retention) side. It drives WTA valuations down, shrinking the WTA-WTP gap. For this reason, I expect the endowment effect to be weaker in an online dating scenario with many alternatives than it would be in a traditional dating scenario with no alternatives.

#### (2) Attachment

Connolly and Reb (2007), Carmon, Wertenbroch and Zeelenberg (2003), and Ericson and Fuster (2013) all argue that the development of some sort of connection or attachment to an object affects its value. Like motivated taste change, the attachment

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<sup>2</sup> Ericson and Fuster (2013) use the term "motivated taste change" to refer to the tendency for people to value possessed items more highly because they associate these objects with themselves.

<sup>3</sup> Self-serving bias refers to the human tendency to view oneself and one's own actions and associations favorably.

theory of loss aversion provides a possible explanation for why losses can feel so painful (Ericson, Fuster 25). Connolly and Reb (2007) compare the effects of *subjective ownership* against those of *factual ownership*. They find that physical possession of an object, or subjective ownership, leads to stronger feelings of ownership and triggers a stronger endowment effect. Factual ownership, on the other hand, when subjects are simply told they have ownership, results in a weaker endowment effect (Connolly, Reb 107). When applied to the dating market, it follows that relationships characterized by actual face-to-face interactions are likely to foster more feelings of attachment than relationships built online. The process of online dating may restrict, or at least delay, emotional attachment.

This lack of attachment is not solely due to the online interface and messaging systems associated with dating platforms; the access to many potential dates brought about by online dating also limits attachment. As discussed above, the objectification of people resulting from seeing each person in the context of many alternatives can reduce feelings of attachment to a single option. The “search” mentality, stimulated by a large number of options, also deemphasizes emotional connections with a potential partner, therefore limiting feelings of attachment. When there are more alternatives, this force should drive valuations down on both the buying (date acquisition) side and the selling (date retention) side. I expect, however, the lack of attachment formed in markets with many alternatives to affect WTA valuations more. Thus, having many alternatives should shrink the WTA-WTP gap. Again, I expect the endowment effect to be weaker in an online dating scenario (many alternatives) than in a traditional dating scenario (no alternatives).

### (3) Cognitive Perspective

The endowment effect may also be attributed to differences in cognitive perspective between buyers and sellers (Ariely and Carmon 360). Buyers focus on the money they are giving up to gain an item, while sellers focus on the item they are giving up to gain money. This fundamental discrepancy in perspective could account for differences in valuations between buyers and sellers<sup>4</sup> (Ariely and Carmon 361). Hanemann (1991) suggests that goods that are more substitutable have a weaker endowment effect.<sup>5</sup> Ariely and Carmon (2000) explain this finding by characterizing substitutability as a trait of the good in question, which is more salient to the seller (Ariely and Carmon 369). If someone sees their possession as irreplaceable, they will be less willing to give it up. In the dating market, online dating increases the apparent substitutability of potential partners. Therefore, the endowment effect should be weaker in an online dating scenario.

In summary, the existing literature provides strong evidence that viewing options in the context of alternatives fundamentally changes the way people perceive their value, and there is no reason to believe that these effects are not operative in the dating market. These psychological factors affect the value placed on opportunities by people trying to retain dating opportunities more than the value placed on opportunities by people trying to acquire dating opportunities. The visibility of alternatives reduces the value of individual dating opportunities, but more so for people on the “selling” side (WTA).

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<sup>4</sup> Ariely and Carmon (2000) provide experimental evidence for this claim using college basketball tickets. They run a series of valuation gap experiments, manipulating the focus of both buyers and sellers (from the opportunity cost of the expenditure to the benefits of attending the game and vice versa), tracking the effect on valuation.

<sup>5</sup> Hanemann (1991) cites Yosemite National Park as an example of a public good with no private good substitutes. He analyzes that, without substitutes, there is nothing to bind the WTA-WTP gap.



### *C. When the Endowment Effect Grows Stronger*

The level of observed loss aversion differs depending on the situation. For example, Nataf and Wallsten (2013) find that the value curve is steeper in the loss domain in the dating market than in more traditional markets (e.g., the market for coffee mugs, candy bars, etc.). They attribute this to two factors: type of good and evolution.

With evidence from markets for public, non-market, ordinary, and private goods, Horowitz and McConnell (2002) find that as a good gets further from being a traditional private good, the endowment effect grows stronger<sup>6</sup>. This supports the possibility that the lack of a clear, known price in the market for dating opportunities may result in a higher observed endowment effect. People may see dating opportunities as difficult to put a price on, resulting in a large gap between low WTP valuations and high WTA valuations. To illustrate, consider the extreme case where no endowment effect arises: when the good in question is a \$10 bill. Since everyone knows that the “market value” of a \$10 bill is \$10, the willingness to accept and willingness to pay are both \$10 in the case. That is, there is no endowment effect. When a good is not traded in markets, the market value is much more ambiguous and, as a result, the difference between WTA and WTP are more likely to emerge.

Brosnan and Jones (2008) observe the endowment effect in chimpanzees, finding support for the notion that the relative overvaluing of possessions is a biological trait. They also find that the magnitude of the effect varies across goods, not randomly, but systematically. Objects with more evolutionary relevance<sup>7</sup>, in general, stimulate a stronger endowment effect (Brosnan and Jones 1968). The dating market is of high evolutionary significance, which might explain why Nataf and Wallsten (2013) find that

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<sup>6</sup> Horowitz, McConnell cite chocolates and movie tickets as traditional private goods and ocean piers and home postal delivery as public/non-market goods.

<sup>7</sup> Objects of greater evolutionary relevance include food, shelter, mating opportunities. Objects of lesser evolutionary relevance include consumer goods, such as coffee mugs.

the value curve is steeper in the loss domain in the dating market than in more traditional markets.

Nataf and Wallsten (2013) also observe significant gender differences in loss aversion in the dating market, noting that females are more loss averse than males. They attribute this to the possibility that men view the dating market as more competitive than women, possibly due to evolved mating mentalities. From an evolutionary perspective, men who developed too strong of an attachment to mates reduced their opportunity to have more children. This is not the case for women, who can only give birth once every nine months and who benefit from stable partners who can help raise children (Nataf, Wallsten 14). In addition to this evolutionary perspective predicting observed gender differences, it also leads me to expect a weaker endowment effect in a situation with many alternatives. The situation with no alternatives more closely resembles our evolutionary past where mating/dating opportunities were relatively scarce (i.e., hundreds of dating opportunities were not available at the click of button). The access to many alternatives leads us away from the setting in which our ancestors evolved.

#### *D. When the Endowment Effect Disappears*

The endowment effect is prevalent in many markets, across many goods, but there are also situations when the effect is not observed. The most obvious case of this, originally cited by Kahneman and Tversky (1991), is with currency itself as discussed above. Loss aversion is not present in the trade of a \$100 bill for \$100 in another liquid form because the market value is so known and so accepted that people value the options the same regardless of their perspective. For this reason, Kahneman and Tversky (1991) argue that loss aversion should not be present in “routine commercial transactions” (Kahneman, Tversky 1055).

In addition, List (2003) finds that the endowment effect in collectible card trading markets disappears for experienced traders. There are two reasons why this result may occur. First, as Kahneman, et al. (1990) point out, the endowment effect does not exist when a good is purchased temporarily, or for resale (Kahneman, et al. 1328). A consumer's intention to buy a product for an indefinite period of time differs from a "trader's" intention to buy a product for the purpose of resale, just as people's intentions differ in the dating market. Some people actively look for temporary arrangements, such as one-night stands, whereas others search for dating opportunities that may turn into lasting, committed relationships. Second, List (2003) demonstrates that those with market experience learn to overcome loss aversion, parting with possessions easily. Somewhat surprisingly, market experience in card trading also limits loss aversion in markets for consumer goods such as coffee mugs (List 25). Given these findings, I expect that experience in the dating market or in the online dating market may also affect levels of loss aversion for dating opportunities. This study tests for these effects, by collecting information on subjects' dating intentions and market experience.

#### *E. Expectations and Hypotheses*

In this study, I manipulate the number of number of potential dating opportunities available to each subject. People either see several profiles or just one profile. Presenting a subject with many simultaneous opportunities imitates an online dating scenario. Simultaneous access to many alternatives is a key feature of any online dating platform that rarely, if ever, occurs in a natural offline environment. The abundance of alternatives signifies a thicker market, allowing the subject to compare many choices simultaneously. Alternatively, presenting a subject with only one

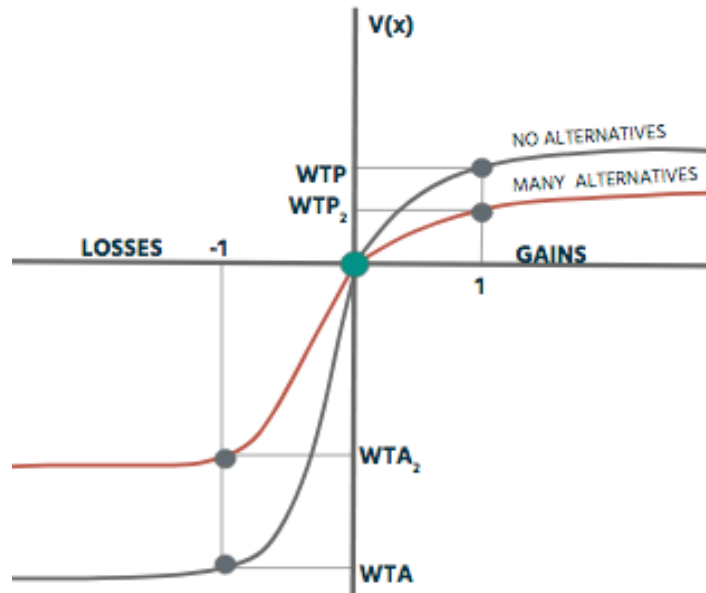
opportunity simulates a more traditional dating scenario. In this environment, potential dating opportunities arise randomly and less frequently, and are evaluated individually, without reference to alternatives.

<b>Theory/Explanation</b>	<b>When the Number of Options ↑, the Endowment Effect...</b>	<b>Systematic Differences in Loss Aversion</b>
Prospect Theory	-	-
Motivated Taste Change	↓	-
Attachment	↓	-
Cognitive Perspective	↓	-
Evolution	↓	Male → Endowment Effect ↓
Dating Intentions	-	Prefers Casual/Short-Term Relationships → Endowment Effect ↓
Dating Experience	-	More experienced with dating and online dating → Endowment Effect ↓

*Table 1. Summary of expected results predicted by each theoretical explanation.*

I expect that the number of alternatives will alter people’s psychological processes, causing people with many alternatives to display less loss aversion than people with no alternatives. Being presented with many options, signifying a more liquid dating market, should put a subject into joint evaluation mode, evaluating his/her/their options against one another. This is more cognitively difficult than separate, individual evaluations and can lead to the objectification and commodification of options in the dating market (Finkel et al. 32). It also limits how highly people value each individual option. In addition, access to many options can put people in “search” mode (Heino, et al. 443), where they are focused on finding the perfect relationship through comparing

options, rather than building an emotional connection with a single option. This limits attachment to any single person, therefore limiting loss aversion. This result is illustrated in Figure 2 by the flatter slope of the curve corresponding to a situation with many alternatives.



**Figure 2.** The hypothesized difference in the endowment effect between a market with many dating alternatives and a market with no dating alternatives, following from the implications of several theoretical explanations.

Displaying a multitude of options makes the alternatives salient to subjects. The cognitive perspective theory suggests this could affect how all people value dating opportunities. People on the buying/date acquisition side, who are focused more on what they must give up to pursue a dating opportunity, may value each single dating opportunity less when it is presented as one of many alternatives (Ariely and Carmon 360). People on the selling/date retention side, who are focused more on the traits of their match, will see their match as more substitutable when they are aware of alternatives. This will lead people on the date retention side to value each dating opportunity less.

Cognitive perspective theory suggests that the latter force, affecting the selling side, is stronger than that on the buying side, predicting a weaker endowment effect in a thicker market.

Again, this result is illustrated in *Figure 2* by a slight decrease in willingness to pay (WTP), corresponding to how people on the date acquisition side value dating opportunities, and a more extreme decrease in willingness to accept (WTA), corresponding to how people on the date retention side value dating opportunities. If having many alternatives limits the effects of motivated taste change and attachment and/or changes the perceived thickness of the dating market, I would expect to see a weaker endowment effect in the market with more alternatives. I would not expect to see this result if subjects do not experience any motivated taste change or attachment during the duration of the experiment and if the number of alternatives does not fundamentally affect the way people evaluate (i.e. joint versus separate evaluation) their options and view the market.

I would also expect people who are interested in more casual or short-term relationships to display less loss aversion compared to people interested in more serious or long-term relationships, and for people with less dating experience to display more loss aversion than those with more experience.

#### **IV. Experimental Design**

Based largely on the work of Nataf and Wallsten (2013), and in collaboration with my colleague, Joe Trier, I developed an original experiment designed to answer the following question: how does access to many simultaneous and comparable dating opportunities brought about by online dating affect loss-aversion in the dating market?

To collect data, I sent an online survey (see appendix for more detailed information) to college students in my social network between the ages of 18-23. I chose this demographic because nearly all young adults are familiar with the concept and language of online dating. In addition, previous research supports the finding of an endowment effect in the dating market for young adults (Nataf and Wallsten).

I created the survey using Qualtrics and distributed it to college students across the country through Facebook and email. A significant portion of the data comes from Macalester College. Pictures of hypothetical dates are taken legally from *Pexels*, a website that offers a wide variety of portraits representative of those included in dating profiles. I chose five male and five female pictures, selected only for their age similarity. Pulling inspiration and content from the popular dating platforms, Tinder and Bumble, my colleague and I built hypothetical dating profiles for each of the photos, including name, age, college major, and a short biography, mimicking the style of online dating profiles.

At the end of the online survey, participants were asked for basic demographic information, including age, gender, and sexuality. Apart from this information, participants were anonymous.

I used a between-subject design for the experiment, separating subjects and comparing average results between different treatments. Participants ( $n = 199$ ) were randomly assigned into four distinct groups. First, they were separated into two conditions: (1) date acquisition or (2) date retention. Participants assigned to the date acquisition condition, which parallels the buying condition from standard endowment effect experiments, represent single people in search of some sort of relationship. Participants in the date retention condition parallel the selling condition from standard

endowment effect experiments, representing people who already have a dating opportunity and are considering giving it up.

Participants from each condition were then randomly assigned to one of two treatment groups: the *many alternatives group* (five potential dates) or the *no alternatives group* (one potential date). The *many alternatives* treatment is meant to mimic an online dating situation. The *no alternatives* treatment represents a traditional dating situation, where prospects are evaluated separately.

After separating subjects by gender of interest, condition, and treatment, there are eight divisions of subjects:

	Date Acquisition / Buy Side	Date Retention / Sell Side
For people attracted to cisgender <b>males</b> ( <b>Many Alternatives</b> )	<b>Survey Version 1</b>	<b>Survey Version 3</b>
For people attracted to cisgender <b>males</b> ( <b>No Alternatives</b> )	<b>Survey Version 2</b>	<b>Survey Version 4</b>
For people attracted to cisgender <b>females</b> ( <b>Many Alternatives</b> )	<b>Survey Version 5</b>	<b>Survey Version 6</b>
For people attracted to cisgender <b>females</b> ( <b>No Alternatives</b> )	<b>Survey Version 7</b>	<b>Survey Version 8</b>

**Table 2.** Description of subject groupings and survey assignments. Cisgender refers to subjects whose sense of identity corresponds to their sex at birth.

#### A. Procedure

Regardless of treatment or condition, every participant was asked to place a dollar value on a specific dating opportunity. Modeling this aspect of the methodology after Nataf and Wallsten’s (2013) experiment, the only restriction on the dollar amount



that participants can enter is that it must be greater than zero. While potentially creating large outliers, this approach avoids the risk of bias created by anchoring subjects' valuations. Nevertheless, I do filter the data for some outliers which I discuss below.

People assigned to the date acquisition condition were shown a gender appropriate profile, either by itself or in the context of other alternatives. They were told that each of the people in the profiles had shown interest in them, but that they had no way to contact any of the "matches." They were asked, "How much are you willing to pay for the ability to contact the person in question?" All people who are attracted to cisgender males in both the many alternatives treatment and the no alternatives treatment evaluated the same profile(s). All people who are attracted to cisgender females in both the many alternatives treatment and the no alternatives treatment evaluated the same profile(s).

People assigned to the date retention condition were shown a gender appropriate profile and told that they could contact the person in question. They see the profile either by itself, or in the context of other alternatives. They were asked, "What's the lowest amount of money you are willing to accept in order to give up the ability to contact this person?" All people who are attracted to cisgender males in both the many alternatives treatment and the no alternatives treatment evaluated the same profile(s). All people who are attracted to cisgender females in both the many alternatives treatment and the no alternatives treatment evaluated the same profile(s).

At the end of the survey, people are asked to answer a series of questions. They provide information on their gender, race, college major, relationship status, sexuality, dating experience, online dating experience, other market experience, and relationship preferences (i.e. casual/temporary or serious/longer term). They are also asked about how well they were able to put themselves in the mindset of being single and searching for a

date. People who said they were not able to get into this mindset, due to being in a committed relationship or other reasons, were excluded from the results.

### *B. Limiting Bias*

Since I did not present subjects with real dating opportunities, nothing is truly at stake using this experimental design, thus introducing hypothetical bias, or bias which occurs when people are not spending and receiving actual money. However, there is no reason to believe that hypothetical bias would affect each treatment group differently. To make the experiment as realistic as possible, I begin the experiment by providing subjects with some context to put them in the necessary state of mind (i.e., “For the purposes of this survey you are single and in search of a date”). I attempt to make the situation as realistic as possible by using language and profile formats that mimic the design of popular online dating platforms for the subject age group. I present all profiles as “matches,” implying that the people in these profiles have all shown some level of interest in the subject.

While administering our experiment as an online survey allowed us to reach many more subjects, I was not able to control the environment as well as I would have been able to in a lab experiment. I combatted this limitation by measuring the time people took to answer questions, ensuring that people took the survey in one sitting with no major breaks.

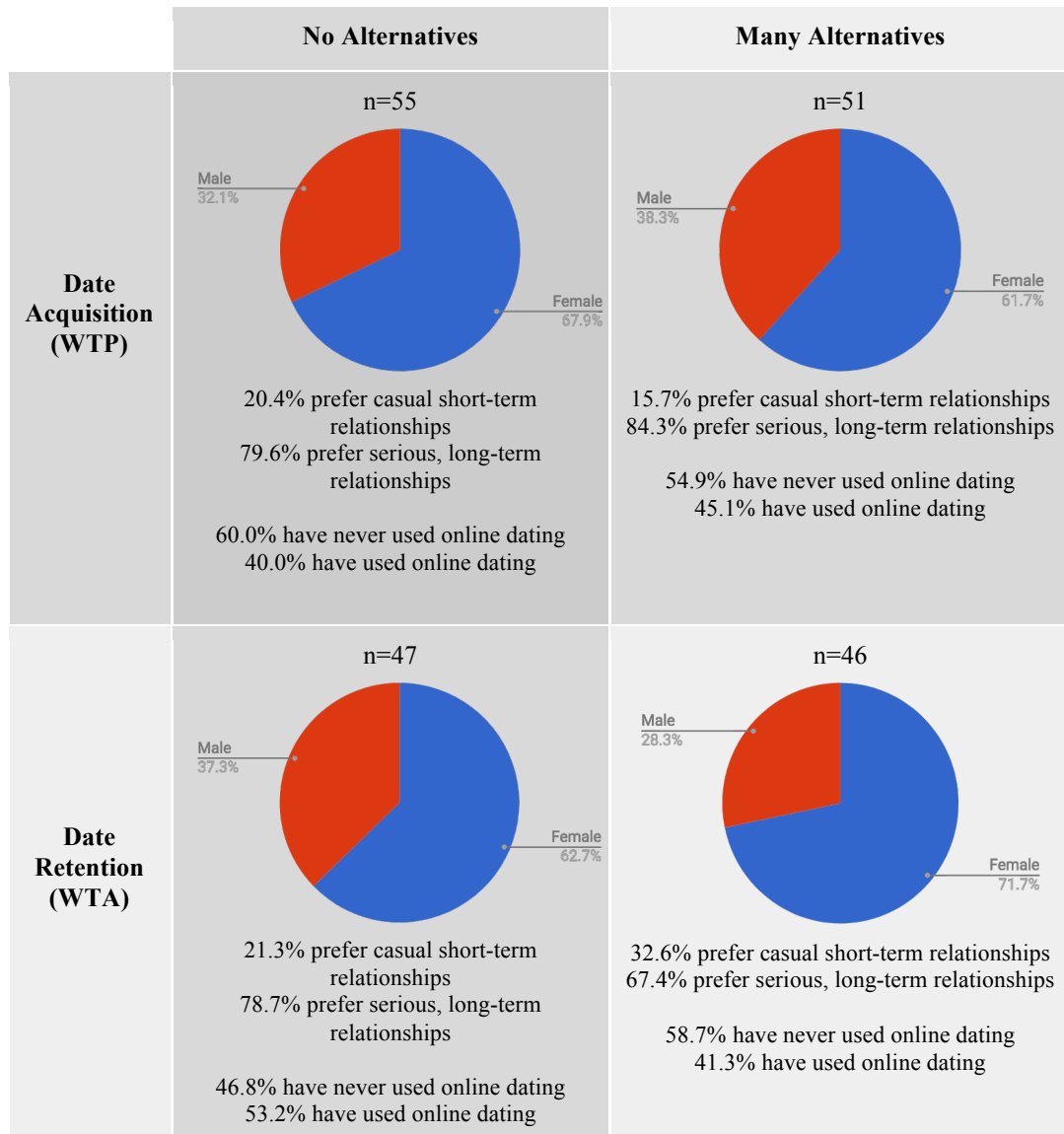
This experimental design also created the potential for non-response bias. Since no one was forced to participate in the study, there is a risk that our self-selected sample does not accurately reflect the population. I attempted to mitigate this risk by making the survey as short as possible.

## V. Results

### A. Summary Statistics

The sample (n=199) consists of young adults (age 18-23) drawn mainly from Macalester College. The sample is 65% female and 35% male. The charts in *Figure 3* show the gender breakdown for each treatment group. Looking at relationship preference, 22% of people in the sample prefer casual short-term relationships compared to 78% who prefer serious-long term relationships. In addition, 55% of people in the sample reported having no experience with online dating while 45% of people reported having at least some online dating experience. I found that 68% of men and 82% of women in the sample, respectively, prefer serious, long-term relationships to short-term casual relationships. Around 44% of men and 46% of women reported having experience with online dating.

Subjects were randomly assigned to each of the four treatment groups. With a large enough sample size, I would expect the breakdown of the sample by each control variable to converge to the true population statistics, therefore becoming consistent across each treatment group. As shown in *Figure 3* below, the treatment groups are statistically similar.



**Figure 3.** Breakdown of each treatment group by key control variables ( i.e. gender, relationship preference, and online dating experience).

### B. Outliers

I was not able to complete any analysis without removing outliers, as some high outliers exceeded \$1,000,000, skewing the data immensely. I chose to eliminate outliers by separating the valuations from each treatment group and using the standard rule for identifying outliers. That is, I calculated the interquartile range of each group, and

eliminated any data point more than 1.5 times the interquartile range above the third quartile. I also tried using different cutoff points and applying them across all treatment groups. The results stayed the same, but lost some significance. This method also caused an issue. Using a cutoff of \$80 as the maximum valuation, 10 outliers would be removed from the WTA / No Alternatives group, four outliers from the WTA / Many Alternatives group, and only one from both WTP groups combined. Eliminating 10 outliers from one treatment group means eliminating one fifth of the data from that group.

### C. Main Results

The results shown in *Table 3* suggest that willingness to pay (WTP) does not differ significantly between the no alternatives treatment and the many alternatives treatment, but willingness to accept (WTA) does, resulting in a stronger endowment effect in the dating market with less alternatives.

n = 199	No Alternatives	95% Confidence Interval	Many Alternatives	95% Confidence Interval
<b>WTP</b>	<b>\$2.63</b>	[\$1.73, \$3.53]	<b>\$2.49</b>	[\$1.45, \$3.53]
<b>WTA</b>	<b>\$23.85</b>	[\$15.27, \$32.43]	<b>\$10.28</b>	[\$6.75, \$13.83]
<b>WTA/WTP</b>	<b>9.6</b>		<b>3.9</b>	

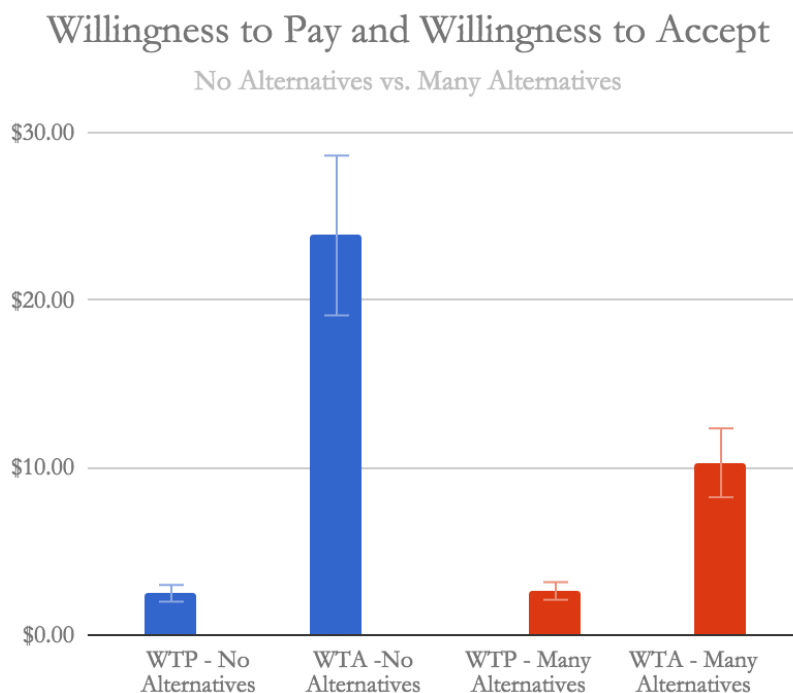
*Table 3.* Average WTP and average WTA for the ‘no alternatives’ and ‘many alternatives’ groups.

When shown just one potential date, willingness to pay for the ability to contact one match averaged \$2.49, with a standard error of \$0.45. Willingness to accept averaged \$23.85, with a standard error of \$4.38. The observed endowment effect in this market was high, with average willingness to accept being 9.6 times higher than the average willingness to pay.

When shown several potential dates, average willingness to pay for the ability to contact one match averages just under \$2.63, with a standard error of \$0.52. This WTP

valuation does not differ significantly from the WTP valuation in the situation with only one option. Willingness to accept, however, averages \$10.28 with a standard error of \$1.81. The observed endowment effect when provided with many alternative options was significantly lower than in the case with fewer options, with average willingness to accept being just 3.9 times higher than the average willingness to pay. Even in this situation, the observed endowment effect is around twice as large as usual observed endowment effects in more traditional markets, such as the market for coffee mugs.

*Figure 3* shows the main result visually.

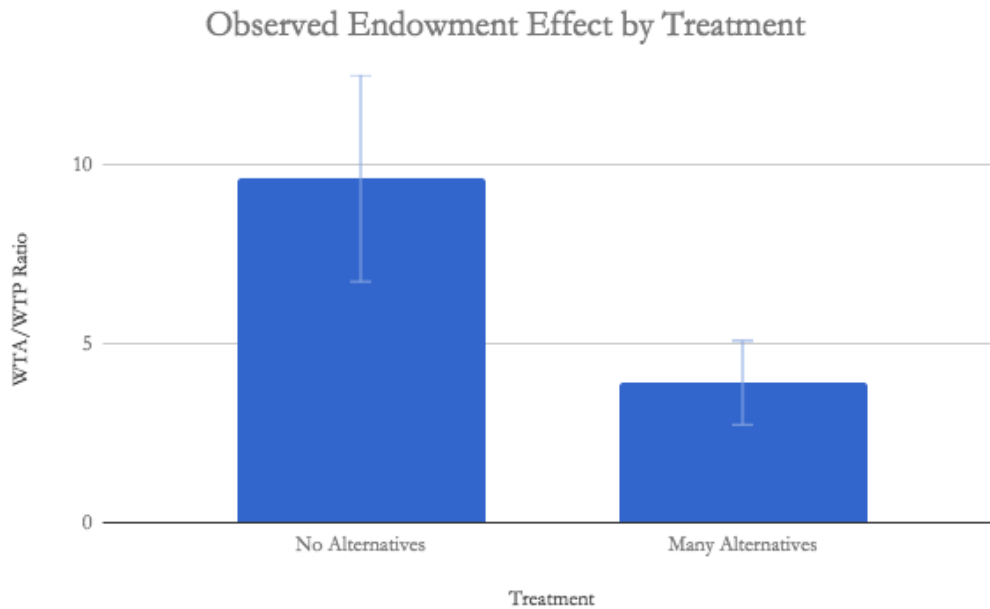


**Figure 3.** Difference in the WTA and WTP between treatment groups. Whisker bars show one standard error.

Not only are the WTA valuations higher than the WTP valuations in each group, they are also more varied. Bounded below by a zero value, the data from each treatment group is right-skewed. The WTA valuations are more skewed because there are more occurrences of high valuations. Even after removing high outliers, WTA valuations were

more varied. This may be explained by individual variation in the experience of the psychological phenomena in play. Some subjects may be more prone to loss aversion than others.

*D. Differences in the Endowment Effect*



**Figure 4.** Magnitude of the endowment effect (measured by the WTA/WTP ratio) in a market with many dating alternatives contrasted with the magnitude of the endowment effect in a market with no alternatives.

Figure 4 shows the magnitude of the endowment effect in the market with no alternatives and the market with many alternatives. In each situation, it is relatively high when compared to the generally accepted WTA/WTP ratio in markets for more traditional goods, which is around 2.2. The endowment effect in the situation with no alternatives (WTA/WTP = 9.6) is larger than the endowment effect in the situation with many alternatives (WTA/WTP = 3.9).

To test if this difference in the endowment effect is significant, I use a hypothesis test for the difference in means between treatment groups where the variables of interest are:

$WTA_{One}$  = average WTA valuation of people who saw a single profile  
 $WTP_{One}$  = average WTP valuation of people who saw a single profile  
 $WTA_{Many}$  = average WTA valuation of people who saw many profiles  
 $WTP_{Many}$  = average WTP valuation of people who saw many profiles

If the number options does not influence the endowment effect, then the difference between the willingness to accept and willingness to pay should be the same no matter how many profiles the subjects saw. More formally, I test the following hypothesis:

**Null Hypothesis:** There is no difference between the endowment effect in a market with many options and a market with few options.

$$H_o: (WTA_{One} - WTP_{One}) - (WTA_{Many} - WTP_{Many}) = 0$$

**Alternative Hypothesis:** The endowment effect in the market with few options is stronger than the endowment effect in the market with many options.

$$H_A: (WTA_{One} - WTP_{One}) - (WTA_{Many} - WTP_{Many}) > 0$$

To test this hypothesis, I ran the following regression:

$$(1) \textit{Valuation} = \beta_0 + \beta_1 * \textit{ValuationType} + \beta_2 * \textit{NumberOfOptions} + \beta_3 * \textit{ValuationType} * \textit{NumberOfOptions}$$

where *Valuation* is the dollar amount subjects reported and *ValuationType* distinguishes whether the valuation is WTA or WTP. The latter is coded as 0 if WTP and 1 if WTA. Therefore, I expect  $\beta_1$  to be positive, (WTA valuations are higher) if there is an endowment effect. *NumberOfOptions* distinguishes whether the valuation was made in the face of many options or one option. It is coded as 0 if many options and 1 if one



option. I expect  $\beta_2$  to be positive, as valuations made when given only one option are higher. The interaction term allows us to distinguish between valuations in the WTA/No Alternatives group and valuations in other groups. I expect  $\beta_3$  to be positive if the WTA/No Alternatives group has the highest valuations. This is what I expect if my theory is correct and providing subjects with more dating profiles lowers the endowment effect.

**Dependent Variable: Valuation (\$) (n=199)**

Variable	Coefficient	Std. Err.
Valuation Type (0 if WTP, 1 if WTA)	7.65**	3.25
Number of Options (0 if many, 1 if one)	0.23	3.11
Valuation Type * Number of Options (Interaction)	13.34***	4.54
* if p < 0.10, ** if p < 0.05, *** if p < 0.01		

**Table 4.** Results from testing the difference between WTA and WTP valuations across treatment groups.

Table 4 provides the regression results for the equation (1). The coefficient on valuation type dummy is positive and significantly different from zero at the five percent level. This indicates, as expected and seen in Figures 3 and 4 above, that the willingness to accept was higher than willingness to pay. That is,  $\beta_1$  is positive providing evidence of the endowment effect. The second line of Table 4 shows that  $\beta_2$  is also positive, but insignificantly different from zero. This indicates, somewhat surprisingly, that the valuations were not significantly different across the no versus five alternative profile treatments. Finally, the third row shows that  $\beta_3$  is positive and significantly different from

zero at the five percent level. This indicates that the subjects provided the highest valuation when they saw one profile and were asked to provide their willingness to pay. In other words, the willingness to accept was significantly lower when the subjects saw many alternatives. This finding is consistent with the theory put forth in this paper.

#### *D. Effect of Control Variables On Valuations*

As discussed above, theory and previous work suggests that willingness to pay and accept might also be influenced by dating experience, preferences for short- versus long-term relationships and gender. To examine systematic differences between groups of people, I ran Ordinary Least Squares (OLS) regressions to examine the relationships between WTA and WTP valuations and the number of dating options presented (one or five), the participant's sex (male or female), the participant's relationship preference (short-term, casual or long-term, serious), and the participant's online dating experience (none or some).

*Table 5* shows several interesting results for willing to accept. It displays that as the number of dating options goes from five to one, the average willingness to accept rises by \$13.57. This result is significant at the 0.05 level and consistent with what we saw in *Table 4*. What is important to note is that this result remains significant when controls are used, with a coefficient of \$12.28, affirming that the treatment groups are statistically similar.

**Dependent Variable: Willingness to Accept (\$) (n=93)**

Variable	Reg 1	Std. Err.	Reg 2	Std. Err.	Reg 3	Std. Err.
Number of Options (0 if many, 1 if one)	13.57**	4.77	12.85**	4.80	12.28**	4.90
Sex (0 if female, 1 if male)	-	-	-	-	.61	5.18
Relationship Preference (0 if serious, 1 if casual)	-	-	-6.38	5.41	-6.78	5.52
Online Dating Experience (0 if none, 1 if some)	-	-	-	-	3.29	3.84
* if $p < 0.10$ , ** if $p < 0.05$ , *** if $p < 0.01$						

**Table 5.** *The relationship between number of options, sex, relationship preference, online dating experience, and WTA valuations.*

Second, the results do not show the gender difference in willingness to accept valuations observed by Nataf and Wallsten’s (2013). Nataf and Wallsten find that females are more loss-averse than males when it comes to dating opportunities, reporting significantly higher willingness to accept (WTA) valuations on average. My failure to replicate this result could be due to bias in the sample, drawing most subjects from a very progressive liberal arts institution. In contrast, Nataf and Wallsten ran their experiment at a large state school, University of Maryland. My result could also reflect increasing normalization of female independence in society since Nataf and Wallsten’s results were published in 2013. In modern society, especially among a progressive, college-educated population, females have become less reliant on romantic relationships to move out of the house and transition to adulthood (Ansari 123). This cultural shift could counteract the evolutionary explanation for gender difference provided by Nataf and Wallsten. Recall, they argue that the gender differences could be due to females having a larger role in

birthing and raising children. In contrast, males, because they are wired with the evolutionary instinct to pass on their genes, optimize by having many partners and fewer attachments. As the cultural focus of young adults is directed away from having children at younger ages, and more toward independent career development, we would expect these gender differences to dissolve.

Third, I found that relationship preference had a negative coefficient as expected. People who prefer casual, short term relationships have, on average, WTA valuations \$6.78 lower than their long-term relationship-seeking counterparts (see Reg 3). While this result is not significant at the 0.05 level. It supports the supposition that people who think about ownership as temporary display less loss aversion than those who think about ownership as potentially permanent (Kahneman, et al. 1328; List, 5). A larger sample size, including more subjects with a preference for short-term, casual relationships may strengthen this finding.

I did not find a significant relationship between the amount of online dating experience and WTA valuations. However, only 11 of the 199 included participants claimed to be regular users of online dating platforms, so I would not rule out the possibility of finding a correlation in a larger, more balanced sample.

*Table 6* contains the results of similar regressions using WTP valuations as the response variable, instead of WTA. As seen in Figure 3, WTP valuations did not vary based on the number of options presented to the participant. WTP valuations, on average, hovered between \$2 and \$3 for both experimental treatment groups: many alternatives and no alternatives.

**Dependent Variable: Willingness to Pay (\$) (n=106)**

Variable	Reg 1	Std. Err.	Reg 2	Std. Err.	Reg 3	Std. Err.
Number of Options (0 if many, 1 if new)	0.22	0.76	0.17	0.78	0.13	0.81
Sex (0 if female, 1 if male)	-	-	-	-	0.22	0.87
Relationship Preference (0 if serious, 1 if casual)	-	-	0.27	1.06	0.42	1.12
Online Dating Experience (Scale from 0-2)	-	-	-	-	-0.04	0.73
* if p < 0.10, ** if p < 0.05, *** if p < 0.01						

**Table 6.** *The relationship between number of options, sex, relationship preference, online dating experience, and WTP valuations.*

As seen in *Table 6*, WTP does not change when the number of options changes regardless of which controls are used, confirming that the treatment groups are statistically similar. This speaks to the psychological impact of salient alternatives, suggesting that the presence of alternatives affects people faced with the opportunity for loss more than the people faced with the opportunity for equivalent gain.

I did not observe any gender differences in WTP valuations. In addition, I did not observe differences in WTP valuations across people with different relationship preferences or across people with different amounts of online dating experience.

**VI. Discussion**

Although this experimental study supports a causal relationship between the number of available dating alternatives and the level of loss aversion people display in the dating market, one key question looms: how generalizable are these results to real world scenarios?

The most important consideration in evaluating this generalizability is the hypothetical nature of the experiment. I expect the hypothetical nature of the experiment to push both WTP and WTA valuations upwards from their true values. Willingness to pay should be higher in the experiment due to the lack of a real budget constraint. While subjects were asked to pay for the ability to contact a match, it is easier to part with hypothetical currency than actual cash. Exaggerated WTA valuations stem from the participant's perception of a money-making opportunity. When subjects were asked to state the lowest amount of money they would be willing to accept to give up the opportunity to contact one of their matches, they may have overstated their WTA for the chance to make more money from the opportunity. When confronted with an actual situation to sell contact information, given an offer from another party, WTA may fall.

Given that WTP and WTA are both expected to be higher in the experiment than in real life, with no clear indication of the difference in the magnitude of these differences, the gap observed between WTP and WTA may actually be an accurate indicator of loss aversion in the real world. There is also no reason to believe the hypothetical bias would differ in magnitude between treatment groups. Even if the WTA and WTP values are skewed, the differences in loss aversion between treatment groups should not be biased.

The nature of this randomized experiment also eliminates the possibility of examining how people value dating opportunities after the initial stages of finding and contacting a potential date. As people progress from evaluating potential dates to actually going on dates, the psychological theories considered predict that people will value their dating opportunities more and more highly as they develop a stronger association and attachment to any given opportunity. Therefore, the nature of this study may limit WTA valuations, as people experience only a short tenure with the matches, lacking face-to-

face interaction and the opportunity to build an emotional connection. As a result, this study may understate the level of loss aversion in the dating market.

Finally, both the sample size and distribution of subjects in this study are possible sources of bias. A sample size of 200 college students most likely does not represent the entire dating market. Additionally, Macalester College students make up the majority of the sample, and while they are in the target demographic, the potential bias created by mainly using data from one campus environment could be eliminated by including a larger sample from a wide variety of colleges.

## **VII. Conclusion**

This study provides evidence that access to an abundance of easily comparable available dating opportunities limits loss aversion in the dating market. It follows that an online dating environment can moderate the endowment effect in the dating market. This finding has both market and behavioral implications.

Just as loss aversion can limit optimal trading in a competitive market, the existence of the endowment effect can create inefficiency in matching markets, such as the dating market. Consider the Gale-Shapley algorithm, a theoretical model which maps the process of reaching an equilibrium set of matches in a matching market. This model consists of two disjoint sets of agents. Each agent has preferences over the other set. In the heterosexual dating market, men make up one set and women make up the other. Men have preferences over women and women have preferences over men. In this model, it is assumed that agents' ordinal preferences stay consistent throughout the entire matching process. Men and women enter in and out of matches until no one can leave their match to become better off (Dubins, Freedman 486). The endowment effect changes this result because people value others more highly once they enter a match with them. If this effect

is strong enough to shift agents' ordinal preferences as they move into matches, the algorithm does not play out as anticipated. Matches are sticky, and this may prevent the market from reaching its same core set of matches.

The endowment effect does not account for all of the stickiness we observe in the dating market. Some of this results from societal factors, such as the institution of marriage, the stigma surrounding divorce, etc.. However, if the existence of online dating limits loss aversion in the dating market, it allows the market to function closer to the predictions of the Gale-Shapley algorithm. If experiencing happiness in a relationship depends heavily upon finding the perfect person to have a relationship with, access to dating opportunities brought about by online dating is beneficial: it gives everyone better odds for finding the perfect match. However, if experiencing happiness in a relationship depends more upon building the perfect relationship with a person, access to many opportunities may actually inhibit the achievement of utility-maximizing matches.

From a behavioral standpoint, if a dating market is saturated with easily comparable alternatives, and willingness to accept (WTA) valuations fall, it follows that people do not value their endowed dating opportunities as highly. As a result, people may not be willing to make as many sacrifices to maintain and retain relationships.

Behaviorally, I would expect to see people allocate less effort to facilitating cooperation and compromise with their partners. Thicker dating markets may also lead to higher rates of breakups and even divorces, which may place added strain on friends and families. On the bright side, however, online dating platforms' successful thickening of the dating market may play a role in empowering people to leave sub-optimal and even abusive relationships.



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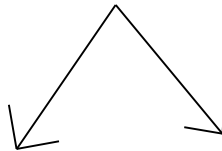
## VIII. Appendix






### A. Survey

For the purposes of this survey, you are single and in search of a date. Are you more interested in matching with male partners or female partners?


Males

Females





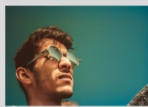


 <p><b>Carter, 21 - Studying Business</b> Hiking, biking, kayaking. Game of Thrones is the best TV of all time. Breweries and brunch. Always looking forward to the next adventure.</p>	 <p><b>Matt, 21 - Studying Chemistry</b> Aspiring Doctor, part time adult. Full time hooligan. I've never lost in Mario Kart, so don't get any ideas.</p>	 <p><b>Jordan, 21 - Studying Film</b> Have you ever wondered why we're on this planet? Me neither.</p>
 <p><b>Liam, 21 - Studying Economics</b> Proud owner of a snowboard, a cat, and a lot of old comics. I will gladly help you with your Math homework. Don't have math homework? You can help me with mine (seriously I'm drowning).</p>	 <p><b>Manny, 21 - Studying Philosophy</b> Californians do it better! Come find me on the nearest beach, soaking up the sun like my name was Sheryl Crow.</p>	




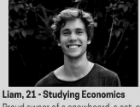

You matched with five people! These people are each interested in going on a date with you, but you do not currently have the means to contact any of them.

 <p><b>Liam, 21 - Studying Economics</b> Proud owner of a snowboard, a cat, and a lot of old comics. I will gladly help you with your Math homework. Don't have math homework? You can help me with mine (seriously I'm drowning).</p>
--


You matched with one person! This person is interested in going on a date with you, but you do not currently have the means to contact him.

 <p><b>Carter, 21 - Studying Business</b> Hiking, biking, kayaking. Game of Thrones is the best TV of all time. Breweries and brunch. Always looking forward to the next adventure.</p>	 <p><b>Matt, 21 - Studying Chemistry</b> Aspiring Doctor, part time adult, full time hooligan. I've never lost in Mario Kart, so don't get any ideas.</p>	 <p><b>Jordan, 21 - Studying Film</b> Have you ever wondered why we're on this planet? Me neither.</p>
 <p><b>Liam, 21 - Studying Economics</b> Proud owner of a snowboard, a cat, and a lot of old comics. I will gladly help you with your Math homework. Don't have math homework? You can help me with mine (seriously I'm drowning).</p>	 <p><b>Manny, 21 - Studying Philosophy</b> Californians do it better! Come find me on the nearest beach, soaking up the sun like my name was Sheryl Crow.</p>	

How much money (In US Dollars) are you willing to pay to get Liam's contact information?


 <p><b>Carter, 21 - Studying Business</b> Hiking, biking, kayaking. Game of Thrones is the best TV of all time. Breweries and brunch. Always looking forward to the next adventure.</p>	 <p><b>Matt, 21 - Studying Chemistry</b> Aspiring Doctor, part time adult, full time hooligan. I've never lost in Mario Kart, so don't get any ideas.</p>	 <p><b>Jordan, 21 - Studying Film</b> Have you ever wondered why we're on this planet? Me neither.</p>
 <p><b>Liam, 21 - Studying Economics</b> Proud owner of a snowboard, a cat, and a lot of old comics. I will gladly help you with your Math homework. Don't have math homework? You can help me with mine (seriously I'm drowning).</p>	 <p><b>Manny, 21 - Studying Philosophy</b> Californians do it better! Come find me on the nearest beach, soaking up the sun like my name was Sheryl Crow.</p>	

You now have Liam's contact information. What is the lowest amount of money (In US Dollars) you would be willing to accept in order to give up Liam's contact information?



**Liam, 21 - Studying Economics**  
Proud owner of a snowboard, a cat, and a lot of old comics. I will gladly help you with your Math homework. Don't have math homework? You can help me with mine (seriously I'm drowning).

How much money are you willing to pay (In US Dollars) to acquire Liam's contact information?



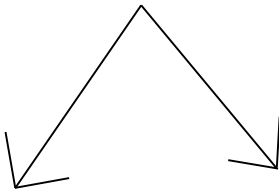
**Liam, 21 - Studying Economics**  
Proud owner of a snowboard, a cat, and a lot of old comics. I will gladly help you with your Math homework. Don't have math homework? You can help me with mine (seriously I'm drowning).

You now have Liam's contact information. What is the lowest amount of money (In US Dollars) you would be willing to accept in order to give up Liam's contact information?

For the purposes of this survey, you are single and in search of a date. Are you more interested in matching with male partners or female partners?


Males

Females




**Anna, 21 - Studying Film**  
Comedian and writer with big dreams of being a featured contestant on season 36 of Survivor.


You matched with one person! This person is interested in going on a date with you, but you do not currently have the means to contact her.




**Liz, 21 - Studying Psychology**  
Fitness, snows, travel, college soccer player, golf, working out, boating, skiing.




**Anna, 21 - Studying Film**  
Comedian and writer with big dreams of being a featured contestant on season 36 of Survivor.



**Ella, 21 - Studying Marketing**  
If you know how to doogie, can you PLEASE teach me? I will gladly bake you cookies, for a small loan of \$1 Million.








**Giano, 21 - Studying Computer Science**  
A girl with a knack for data. I love all things chocolate. Go Steelers!








**Margaret, 21 - Studying Biology**  
Future doctor with a firm belief that you can never have too many dogs.

You matched with five people! These people are each interested in going on a date with you, but you do not currently have the means to contact any of them.

 <p><b>Liz, 21 - Studying Psychology</b> Fitness, shoes, travel, college soccer player, golf, working out, boating, skiing.</p>	 <p><b>Ella, 21 - Studying Marketing</b> If you know how to dougie, can you PLEASE teach me? I will gladly bake you cookies, for a small loan of \$1 Million.</p>	 <p><b>Margaret, 21 - Studying Biology</b> Future doctor with a firm belief that you can never have too many dogs.</p>
 <p><b>Anna, 21 - Studying Film</b> Comedian and writer with big dreams of being a featured contestant on season 36 of Survivor.</p>	 <p><b>Giana, 21 - Studying Computer Science</b> A girl with a knack for data. I love all things chocolate. Go Steelers!!</p>	

How much money (in US Dollars) are you willing to pay to acquire Anna's contact information?

 <p><b>Liz, 21 - Studying Psychology</b> Fitness, shoes, travel, college soccer player, golf, working out, boating, skiing.</p>	 <p><b>Ella, 21 - Studying Marketing</b> If you know how to dougie, can you PLEASE teach me? I will gladly bake you cookies, for a small loan of \$1 Million.</p>	 <p><b>Margaret, 21 - Studying Biology</b> Future doctor with a firm belief that you can never have too many dogs.</p>
 <p><b>Anna, 21 - Studying Film</b> Comedian and writer with big dreams of being a featured contestant on season 36 of Survivor.</p>	 <p><b>Giana, 21 - Studying Computer Science</b> A girl with a knack for data. I love all things chocolate. Go Steelers!!</p>	

You now have Anna's contact information. What is the lowest amount of money (in US Dollars) you would be willing to accept to give up Anna's contact information?



**Anna, 21 - Studying Film**  
Comedian and writer with big dreams of being a featured contestant on season 36 of Survivor.

How much money (in US Dollars) are you willing to pay to acquire Anna's contact information?



**Anna, 21 - Studying Film**  
Comedian and writer with big dreams of being a featured contestant on season 36 of Survivor.

You now have Anna's contact information. What is the lowest amount of money (in US Dollars) you would be willing to accept in order to give up Anna's contact information?



*B. Statistical Analysis*

**Stata Do File:**

```

/*wta regressions*/
reg wta dnopnew
reg wta dnopnew dprefrelationship
reg wta dnopnew dsex dprefrelationship donlinedatingexperience

/*wtp regressions*/
reg wtp dnopnew
reg wtp dnopnew dprefrelationship
reg wtp dnopnew dsex dprefrelationship donlinedatingexperience

/*difference in differences (significance of the difference in endowment effect)*/
gen interact=dval*dnopnew
reg val dval dnopnew interact

```

**Difference in Difference of Means Regression.**

I determine the results are significant from this regression because the p-value on the interaction term is less than 0.05.

```
. reg val dval dnopnew interact
```

Source	SS	df	MS	Number of obs	=	199
Model	14545.1596	3	4848.38655	F(3, 195)	=	19.00
Residual	49755.3042	195	255.155406	Prob > F	=	0.0000
				R-squared	=	0.2262
				Adj R-squared	=	0.2143
Total	64300.4639	198	324.749818	Root MSE	=	15.974

val	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
dval	7.654177	3.248062	2.36	0.019	1.248337 14.06002
dnopnew	.2261141	3.105195	0.07	0.942	-5.897964 6.350192
interact	13.34255	4.540697	2.94	0.004	4.387372 22.29774
_cons	2.628431	2.236749	1.18	0.241	-1.782895 7.039757