The Effect of Comparison Target and Resource Stability on Delay Strategies in Decision Making

by

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A Thesis Presented in Partial Fulfillment of the Requirements
for the Degree of Master of Arts in Psychology

Pending Approval April 2015 by
the Graduate Supervisory Committee:

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ARIZONA STATE UNIVERSITY

April 2015

ABSTRACT

People commonly make decisions and choices that could be delayed until a later time. This investigation examines two factors that may be especially important in these types of decisions: resource stability and comparison target. I propose that these two factors interact to affect whether individuals tend to adopt a delay strategy or whether they engage in more present-oriented strategy. Specifically, this thesis study tested whether picturing one's ideal led to the adoption of a delay strategy to a greater extent when resources were stable and to a lesser extent when resources were unstable. Participants read a house-hunting scenario in which the market was stable or unstable, and either pictured their ideal house at the beginning of the task or did not. As expected, participants in the stable housing market were more willing to delay choosing a house, though the predicted interaction between resource stability and comparison target did not emerge. Contrary to the predictions, however, participants who pictured their ideal house were more willing to choose a house immediately and were more satisfied with the house they chose. Overall, these findings did not lend support to the main argument of this investigation that picturing one's ideal would promote a delay strategy under stable resource conditions. The finding that participants preferred immediate choice after picturing their ideal may have interesting implications for persuasion and advertising.

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In everyday life, individuals face endless choices and decisions–where to live, whom to date, what car to buy, and so on. Many of these decisions involve evaluating and choosing among various prospective options. This thesis study aims to examine how different comparison targets affect the decision process when individuals have the ability to delay their decision until a later time. Recently, researchers in judgment and decision making have criticized the dominant methodologies in use and have called for a more ecologically-valid approach (e.g., Todd & Gigerenzer, 2003; Goldstein & Gigerenzer, 2002). This investigation argues that one limitation with much of the past literature is that it focuses on decisions that are restricted to a particular point in time, such as choosing immediately between two options. One way to take a more ecologically-valid approach would be to examine decision-making contexts that include dimensions of time and delay, where individuals can decide whether to choose something immediately or choose to wait. This investigation proposes and tests two factors–comparison target and resource stability–that may influence these types of decisions and whether individuals elect to delay. This is most applicable to settings where resources turnover with time, where new prospects become available as old ones go off the market. Potential mates find partners, and others become available. Job openings are filled, and others become open. As houses are sold, others come on the market when people die or move away.

One factor that will influence this process and whether individuals choose to delay is how stable or unstable those resources are. With the types of resources that turnover, it may be advantageous for decision makers to delay their decision until a better house, better mate, or better job comes along. When resources are stable, adopting a delay strategy may be more beneficial because it allows the decision maker to acquire more resources and because better options may become available. Then again, better prospects may not come along, and deferring the decision runs the risk of losing out on those good opportunities for good. When resources are unstable, it may be less beneficial to adopt a delay strategy because of the possibility that there will be no resources, or no desirable resources, left later on. Individuals may be attuned to this logic and may respond accordingly to cues of resource stability or resource instability by becoming more willing to delay or less willing to delay, respectively.

Another factor that will tend to influence the decision process is the reference point, also referred to as comparison target, against which decision makers compare potential options. One reference point that should be especially salient and relevant in these decision settings is an individual's ideal or goal. Using an ideal or goal as the primary reference point in the evaluation and selection among a set of prospective options may promote a future-focused, long-term decision strategy when the available options are clearly not as desirable as the ideal.

The consideration of reference points is especially important in the American cultural context because pervasive advertising provides people with idealized comparison

targets to use in their everyday decisions. For example, when a house hunter has her ideal home, or "dream home," in mind when she assesses potential domiciles, she tends to focus on the features those houses have in common with her ideal and on the features her ideal home has that are absent in those houses. The salience of her dream home may lead to this house hunter showing greater persistence, focusing on the future, and being more willing to delay making an offer on a house when the available options are less than ideal.

Holding a salient ideal also has potential consequences for attention. When an ideal is salient, the decision maker looks to see if the available options are similar to that ideal and have the same features. When an option lacks the same features as the ideal, it becomes a glaring omission. It is a common saying among realtors that "kitchens sell houses." Let's say that this decision maker's ideal house has a modern kitchen with stainless steel appliances, dark granite countertops, and a floor plan that incorporates the kitchen into the living space. When she looks at a house with a kitchen that has an open floor plan, stainless steel appliances, white tile countertops, and a wood floor, she tends to focus on the layout and appliances as important positives, tends to focus on the countertops as a notable negative, and directs less attention to the flooring. She also notices things about this house that cue longevity, such as the quality of building materials, and things about this house that may not be pertinent until many years later, such as the quality of the school district or resale value of houses in that neighborhood. In general, she remains willing to wait to make an offer until she finds the house that she really wants. In contrast, another house hunter may simply look at the available houses in

his price range. Instead of comparing houses to his ideal, he may compare each available option to one another in order to figure out which one is "best." Compared to the house hunter picturing her ideal, this house hunter adopts a more present-oriented strategy, focuses on what is immediately available to him, and is less willing to wait to see what becomes available later.

This thesis examines two factors–resource conditions and comparison target–and their role in the decision-making process. First, I review past research on known decision strategies and their underlying comparison processes, contrasting them with using ideals as reference points and with adopting a delay strategy. Second, I consider how comparison processes direct attention and may impact the decision process. Third, I review the literature on how environmental factors impact decision making and consider, specifically, how analogous resource conditions may also impact the decision process. Fourth, I integrate the two factors of interest and contend that comparison target and resource conditions interact to influence decision making and whether or not individuals adopt a delay strategy. I propose that individuals who use their ideal or goal as their primary comparison point tend to adopt a more future-oriented, delay strategy than those who do not, and that stable environments tend to allow, if not promote, delay strategies, whereas scarce, unstable environments tend to constrain decision makers to use present-oriented strategies. In addition, these two factors may interact to affect decision strategies, such that picturing one's ideal when resources are stable promotes the use of a delay strategy, but picturing one's ideal when resources are unstable does not promote a

delay strategy. This investigation tests these predictions by using an experimental methodology that manipulates resource conditions and comparison target.

Known Decision Strategies Versus Prototype Matching and Delay Strategy

Considering two well-known, well-researched decision strategies–*maximizing* and *satisficing*–illustrates how decision strategies are often conceptualized, the importance of comparison processes, and also a gap in the literature that this thesis aims to address. Simon (1955, 1956, 1957) proposed the distinction between maximizing and satisficing as two different decision strategies that individuals may use when making choices. A decision maker using a maximizing strategy (a *maximizer*) seeks the best available outcome, often by comparing all available options to one another (Mills, Meltzer, & Clark, 1977) or by conducting an exhaustive search of all possibilities (Iyengar, Wells, & Schwartz, 2006). In contrast, an individual adopting a satisficing strategy (a *satisficer*) evaluates options until finding one that passes his or her minimum threshold of "good enough." Another way of conceptualizing the difference between these two strategies is by the question that guides decision makers: When confronted with choices and evaluating options, maximizers are described as asking themselves "is this the best option?" whereas satisficers are described as asking themselves "is this a good option?" (Schwartz, Ward, Monsterosso, Lyubomirsky, White, & Lehman, 2002). The current investigation examines how the decision process is affected by individuals comparing options to their ideal and asking themselves "how close is this to what I want?" This thesis will herein refer to this comparison process as *prototype matching*.

The distinction between these two decision strategies demonstrates the role of comparison processes in decision-making strategies; instead of comparing all possible options to each other as maximizers do, satisficers compare each option to the threshold of what they consider acceptable. This thesis considers how the use of a different comparison target in prototype matching–the decision maker's ideal–influences the decision process. Unlike maximizing and similar to satisficing, the prototype-matching decision maker compares options to a single target. In contrast to satisficing, this comparison target is much more desirable and would tend to promote downward comparisons to choice options if, as is often the case in real life, the available options fall short of one's ideal. Satisficing, in contrast, would promote either upward or downward comparisons to options, depending on which side of the "good enough" threshold they fall, and would promote, by definition, an upward comparison to a chosen option that falls above that threshold.

One dominant methodology for researching maximizing and satisficing decision strategies has been the development of individual-difference instruments to assess which decision strategy individuals predominantly use (e.g., Schwartz, Ward, Monsterosso, Lyubomirsky, White, & Lehman, 2002; Turner, Rim, Betz, & Nygren, 2012; Diab, Gillespie, & Highhouse, 2008). Of the paradigms that include actual decisions or choices, participants most often must choose immediately. In many ways this is not inappropriate; because maximizing focuses decision makers on what is currently available and directs them to the relatively best option, it could be considered a present-oriented decision

strategy. A more ecologically-valid approach, however, would take into account the dimension of time and ability of decision makers to delay. As Gigerenzer and colleagues emphasize in their model of ecological rationality, the ability of particular heuristics and decision strategies to enable good decision making depends on their fit with the particular environment (e.g., Todd & Gigerenzer, 2003; Goldstein & Gigerenzer, 2002). In this case, there seems to be a fundamental mismatch between a maximizing strategy and environments in which a long-term strategy is advantageous. In contrast, prototype matching leads decision makers to focus on their ideals, which are often beyond what is currently available to them and only available sometime in the future. Because of this and because of an increased focus on future utility, prototype matching may promote a long-term, delay strategy that would be better suited to these types of decisions that can be delayed or environments that benefit long-term strategies.

Though relatively few studies in the decision-making literature explicitly give participants the option to defer their decision until a later time, the findings of one study that did allow participants the option to delay illustrate the importance, and feasibility, of considering the temporal dimension of decision making and the ability of decision makers to delay. This study demonstrated that high conflict among available options increases the preference to delay making a choice (Tversky & Shafir, 1992). Consider two goods that vary on two attributes, A and B. When one good is better on attribute A and the other good is better on attribute B, these goods are considered to be in conflict; one option is not clearly better than the other one. When one good is better on both A and

B than the other good, it is said that the better good is dominant. This is a simple but straightforward way to conceptualize conflict among sets of options. This research examined patterns of decision making across three different sets of options: (1) a good Sony CD player on sale and the option to delay and learn more about the products; (2) two options that were in conflict–a good Sony CD player on sale versus a more expensive, top-of-the-line Aiwa CD player on sale–and the option to delay; or (3) two options in which one was dominant–a good Sony CD player on sale versus a less attractive CD player–and the option to delay. Participants preferred to delay more frequently when there were multiple options in conflict (46%) than when there was one good option (34%) and when there were multiple options with one dominant option (24%). These findings illustrate the impact of being able to delay on decision making and support the call for a more ecologically-valid approach that takes into account individuals' ability to delay making decisions, even for fairly mundane goods.

Comparison Processes Direct Attention

Understanding how individuals make comparisons provides insight into how decision strategies influence what information individuals attend to and what information is influential in the decision process. This would implicate a mechanism through which prototype matching may influence the decision process. Models of comparison processes are especially relevant to these types of decisions and, importantly, lead to specific predictions about how particular decision strategies impact which features individuals tend to focus on and remember. The most relevant model of comparison, Tversky's

feature matching model (1977), would predict that individuals who prototype match, who compare options to their ideal, tend to focus on shared features and on negative features of those options, especially features that exist in their ideal but not in the options.

The feature-matching model provides insight into comparison processes and can be used to make predictions about which features will be most impactful in decision processes. This model represents objects as collections of features and describes similarity between two objects as an increasing function of common features and a decreasing function of features that are not shared. In addition, the feature-matching model focuses on the direction of comparison and makes predictions about which features are going to be most salient when making similarity judgments. Individuals start with one comparison target, the *subject*, and look for the features of the subject in a second comparison target, the *referent*. When individuals see many of the features of the subject in the referent, it leads to judgments of high similarity. When individuals see few features of the subject in the referent, it leads to judgments of low similarity. Importantly, this perspective makes predictions about which features are going to be most salient: common features between subject and referent, and features present in the subject but absent in the referent. In addition, subsequent research indicates that the relatively more accessible, salient stimulus tends to be the subject of comparison (e.g., Agostinelli, Sherman, Fazio, & Hearst, 1986). When the feature-matching model of similarity judgments is applied to the current investigation, I would expect individuals' ideals and goals to be the subject of comparison because of the high salience and great personal

importance of ideals. Individuals who focus on a particular ideal look for the features of the ideal in prospective options and may especially notice the features the options have in common with the ideal and the features present in the ideal but absent in the options.

In summary, when individuals use prototype matching, I predict the features that tend to become salient are (1) those shared by the ideal and the options, and (2) the features present in the ideal but absent in the options. Knowing which features are likely to be salient and impactful in the decision process enables predictions concerning which options individuals are likely to choose when using prototype matching–those options that have the most features in common with the ideal. This may be important because it suggests that features that are important and useful may not be given appropriate weight in the decision process if they are absent from the ideals that decision makers envision.

Environmental Factors and Resource Stability

Environmental factors influence intertemporal decision making and may also influence decision strategies. Research from a life history perspective, for example, has shown that individuals from harsh, unstable environments during their childhoods tend to develop behavioral strategies indicative of a fast life history strategy, such as sexual activity at an earlier age and other present-oriented tendencies (e.g., Belsky, Schlomer, & Ellis, 2012; Daly & Wilson, 2005; Krueger, Reischl, & Zimmerman, 2008). Recent empirical research indicates that such present-oriented strategies, which include steep temporal discounting and preference for risk, emerge when those individuals are faced with mortality cues (Griskevicius, Tybur, Delton, & Robertson, 2011). Researchers from

this perspective, however, emphasize that in such environments these behavioral strategies may be adaptive, or may have been adaptive in ancestral environments. That is, these decision strategies should not be framed as irrational or maladaptive, as behavior indicative of steep temporal discounting often is in the literature. This thesis examines a proximate factor that may influence decision strategies in a way that is analogous to the influence of early childhood environments on life history strategies–resource instability and scarcity. In this context of this investigation, *resources* refer to the particular type of options or alternatives a decision maker can opt to pursue or choose, such as houses or romantic partners.

In general, resource instability likely promotes present-oriented decision strategies, whereas resource stability likely promotes the adoption of a delay strategy. In environments where resources are unstable, however, decision strategies may likely be constrained because of the real possibility of ending up with nothing. Though future-oriented strategies that promote delay of decisions are often lauded and shown to be associated with positive outcomes, they may actually be less useful under conditions of resource instability and increase the likelihood of a decision maker coming up empty handed. In environments where resources are stable or plentiful, however, a wider range of decision strategies are feasible because these environments often do not pose the danger of ending up with nothing. When resources are stable, individuals have more latitude to adopt either a present-oriented strategy or a future-oriented strategy. In addition, individuals' decision strategies may be more variable and more malleable in

these types of environments because a wider range of decision strategies can feasibly lead to an acceptable outcome.

Following that line of reasoning, this thesis proposes that comparison target and resource conditions interact to affect the decision process. Though prototype matching may generally lead to the adoption of a delay strategy, resource conditions may qualify this effect such that the magnitude of the effect is greater when resources are stable and that the magnitude of the effect is diminished when resources are unstable. That is, resource instability may constrain the emergence of delay strategies and promote short-term strategies such that when individuals picture their ideal, delay strategies may not emerge to the same extent that they would under resource stability. This predicted interactive effect stands in contrast to the possibility of additive effects of the two factors. If we were expecting additive effects, the difference between control and prototype matching would be the same in both resource conditions, though we would expect them both to be lower under resource instability. In contrast, this investigation asserts that the difference between control and prototype matching in the willingness to adopt a delay strategy will be greater under resource instability because individuals are sensitive to the greater risk associated with delay in unstable environments.

Outcomes and Predictions

This thesis contends that comparison targets and resource conditions influence the decision process and whether individuals adopt a delay strategy or a more present-oriented strategy. Up to this point, terms like short-term, present-oriented strategy and

future-oriented, delay strategy have been used broadly to encompass several conceptually-related but distinct tendencies. I conceptualize a presented-oriented strategy as consisting of a increased preference for immediate choice, decreased preference for delayed choice, a general present-focus, and steeper temporal discounting. Conversely, I conceptualize a delay strategy as consisting a decreased preference for immediate choice, increased preference for delayed choice, a general future focus, and less steep temporal discounting. Because the measures of future orientation, present orientation, and decision timing were all situated within the context of the study and conceptually similar, I discuss my predictions for these measures together. Because this study employed a domain-general temporal discounting measure, I discuss my predictions for this measure separately.

Temporal Orientation and Decision Timing. I predict that prototype matching tends to engender a broad future focus, increased preference for delayed choice, and decreased preference for immediate choice. When individuals consider their ideals and goals, they are most often considering their future, what they are striving for, or what they hope to achieve. Prototype matching may also highlight better potential options that could be available at a later time. Even if they do not already have a clear goal or ideal in mind, thinking about what their goals or ideals might be is likely to shift their temporal focus to their future, as they dwell on what could be better than it is right now. Characteristics that connote future utility–durability, longevity of usefulness, and future monetary value–may become especially salient and impactful in decision making in this

future-oriented mindset. In contrast, I expect that resource instability leads to focusing on the present, increased preference for immediate choice, and decreased preference for delayed choice because of the uncertainty concerning what will actually be available in the future. These present-focused individuals, on the other hand, should place additional importance on features that signal immediate usefulness, fulfill short-term goals, or satisfy current needs. Further, I predict these two factors interact such that picturing one's ideal may lead to a delay strategy to a greater extent when resources are stable than when they are unstable.

Temporal Discounting. I predict that use of ideals or goals as the primary comparison target may have domain-general effects, in addition to impacting aspects of the immediate decision process. Specifically, having a salient, vivid goal or ideal may function in the same way as holding a vivid mental representation of one's future self, which is associated with less steep of temporal discounting. A recent perspective, the *future self-continuity* model, proposes that perceptions of the future self in relation to the current self is a strong predictor of intertemporal decision making, such that perceiving the future self as similar and connected to the current self, picturing the future self vividly, and holding a positive view of the future self reduce temporal discounting (Hershfield, 2011; Ersner-Hershfield, Garton, Ballard, Samanez-Larkin, & Knutson, 2009). Experimental procedures that increased vividness of the future self, either through an immersive virtual reality environment or by morphing participants' photos to appear as their older self, exhibited greater monetary saving behavior (Hershfield, Goldstein,

Sharpe, Fox, Yeykelis, Carstensen, & Bailenson, 2011). People's ideals and goals are often part of their mental representation of the future. Important ideals and goals may also be key, if not fundamental, aspects of how individuals see themselves. Thus, it is reasonable to predict that having a vivid mental representation of one's ideals or goals may have similar consequences as having a vivid mental representation of one's future self, especially when those ideals or goals are important parts of the self concept. Following this line of reasoning, prototype matching may likely result in less steep temporal discounting, in placing greater weight on the future. Resource instability, on the other hand, may lead to steeper discounting because it makes salient present utility and casts a veil of uncertainty around possible future utility. These two factors may interact in a similar way as I predict the other outcomes will; prototype matching may only lead to less steep discounting under stable resource conditions, whereas it may not have as much of an effect on discounting when resources are unstable.

Choice. I predict that comparison target influences the salient features in the options, which in turn impacts choice. Specifically, I expect that prototype matching would lead individuals to prefer options that have many shared features with their ideal, especially concrete features that are easy to compare. This may seem very intuitive, but it suggests that useful, important features may not be sufficiently attended to if they are not contained in the decision maker's ideal.

Post-Choice Satisfaction. I would expect, reasonably, that most available options fall short of individuals' ideals. Because of this, I predict that prototype matching

typically involves a downward comparison from the ideal to the options, which would tend to lead to diminished satisfaction with the chosen option.

Current Investigation

Overview

This study examined how comparison target and environmental factors may interact to affect decision processes. Participants imagined that they were house hunting. House hunting is a domain in which delay (how long you spend looking at houses) and resource stability (how often new houses are coming on the market) are crucial to consider when making a decision. New houses may come on the market, and these new houses may be better than what is already on the market, so there are times when it is highly advantageous for house hunters to delay making an offer.

Method

Participants

Participants were current undergraduate students at a large Southwestern university who were recruited via the undergraduate psychology participant pool. The study included a *catch* question that prompted participants to provide a specific answer (*If you are reading this question, answer 'Not at all like me.'*). The final sample included the 259 participants (84.9% of total, 65.9% female, M_{age} = 19.39) who provided the correct answer to the catch question.

Study Design

This study employed a 2x2 between-subjects design. The two independent variables were Market Information, which manipulated cues of resource stability, and Comparison Target, which manipulated the reference point against which participants would evaluate their options. Participants completed a decision-making scenario in which they were house hunting. To manipulate resource stability, participants read either that the housing market was stable (n = 132) or that it was a seller's market (n = 127). To manipulate the salient reference point participants would use when evaluating prospective houses, they were told to picture and describe their ideal house (n = 132) or were given no special instructions (n = 127). Of the four possible conditions, seller's market and control comparison target had 61 participants, and the three other conditions had 66 participants.

Power Analysis

I conducted a prospective power analysis using G*Power 3.1 to determine the minimum sample size required for this study. To detect a medium effect (f = .25) with this study design at .8 power and α = .05, the minimum total sample size would be 128. Based on this, we would conclude that this study has sufficient power to detect medium-sized, or larger, effects. I conducted a retrospective sensitivity analysis to determine the effect size this study had the power to detect. According to G*Power 3.1, at .8 power, this study could detect an effect size of f = .18.

Procedure

Participants completed the study online. After reading the cover letter, they were given an overview of the house hunting task and some instructions. The Market Information manipulation was embedded in the instructions, and participants were randomly assigned to one of the two conditions. Next, participants were randomly assigned one of two Comparison Target conditions. After the two manipulations, participants began house hunting by stating their general housing preferences concerning size and number of bedrooms, which were used to match them to a set of relatively small, medium, or large houses. Each of the three sets of two houses was identical with the exception of square footage and number of bedrooms. One house was slightly larger than the other house, and the other house had a slightly better kitchen. Participants were told they had been allocated $215,000, the current median house price in the United States (http://realestate.msn.com/2014-housing-outlook-home-prices-head-higher; http://www.kiplinger.com/article/real-estate/T010-C000-S002-housing-outlook-2014.html), with which they could make an offer on one of the two houses.

Participants viewed and rated the two houses, indicated how willing they were to delay making an offer, indicted how willing they were to make an offer immediately, and then reported whether they wanted to make an offer immediately or to delay. Regardless of what they wanted to do, they were told that the two houses they saw were representative of the houses on the market and to choose one of them. After choosing a house, participants filled out post-choice satisfaction questions, evaluated potential

renovations that were either present-oriented or future-oriented, and completed a time preference measure. They also filled out ancillary measures, including self-reported use of various decision strategies and various demographic questions.

Measures

Decision Timing. Three measures assessed when participants wanted to make their decision. On a 7-point scale, participants reported how willing they were to delay making an offer on a house and how willing they were to choose a house immediately. As expected, these two measures were negatively correlated, r (258) = -.36, $p < .001$. Although one could make an argument to combine these two items into a single measure, I drew on recent psychometric work that recommends separating consideration of the future and consideration of the present; despite being negatively related, these two constructs appear to have independent predictive qualities (Joireman, Balliet, Sprott, Spangenberg, & Schultz, 2008). In addition, research has distinguished among choice and non-choice as unique but not necessarily opposite psychological factors (Botti & Iyengar, 2004). Conceptually, higher willingness to delay and lower willingness to choose immediately represent a long-term strategy, whereas the converse represents a short-term strategy. The third measure was a binary-choice measure–whether participants indicated that they wanted to delay making an offer or wanted to choose one of the two houses immediately.

Preference for Immediate or Delayed Utility. To assess preference for immediate versus delayed utility, this study included both domain-relevant measures,

which asked participants to rate potential renovations, and a domain-general time preference measure, which was adapted from an existing measure used in contemporary temporal discounting research (e.g., Weber, Johnson, Milch, Chang, Brodscholl, & Goldstein, 2007). We altered the certainty of the larger delayed reward from 100% to 95% to limit the possibility of demand characteristics of the measure. Participants may have seen that we were testing whether the preferred a smaller amount now versus a larger amount later and, in turn, selected all the delayed choices.

Participants were asked to rate eight potential renovation options. Half of the options were *future-oriented*–they had cues of longevity and were less extensive renovations that used higher-quality materials–and the other half of the options were *present-oriented*–they lacked cues of longevity and were more extensive renovations that used mid-grade materials. The reliabilities of both the future-oriented items, Cronbach's $\alpha = .58$, $N_{items} = 4$, and the present-oriented items, Cronbach's $\alpha = .53$, $N_{items} = 4$, were acceptable, given the small number of items. I formed a composite of each of these two a priori groupings of items.

Participants completed a domain-general time preference measure adapted from a validated, existing measure (e.g., Weber, Johnson, Milch, Chang, Brodscholl, & Goldstein, 2007). Participants were told to imagine that they were going to be given a $50 Amazon.com gift card. They were given choices between accepting the gift card immediately or a 95% chance of receiving a larger gift card in three months, ranging from $50 to $100 in $5 increments, presented in a randomized order. That is, for each $5

increment between $50 and $100, participants choose whether they want to take the $50 gift card now or have a 95% chance for a gift card of that amount, which would be received three months later. Participant responses were recoded to be on an 11-point scale, representing how many times they chose to take the gift card immediately. Conceptually, the more often participants take the $50 gift card immediately, the steeper the discounting and the greater the preference for immediate rewards. If participants indicated that they would take a 95% chance of a $50 gift card in three months over a $50 gift card immediately, the response was omitted. If participants had more than one *equivalence point*–switching from immediate to delayed or from delayed to immediate–the response was omitted because it was not codeable. That is, if a participant selected to received the $65 gift card immediately, the $70 gift card in three months, and the $75 gift card immediately, the response was not included.

Post-Choice Satisfaction. Participants answered five questions concerning how positively or negatively they viewed the house they chose and their satisfaction. These included three questions modeled after those that have been used in previous research (Iyengar, Wells, & Schwartz, 2006): "*How satisfied are you with the offer you have made?*" "*How much do you like the house you made an offer on?*" and "*How confident are you that you made the right choice about which house to make an offer on?*" The two other questions were "*How strong is your preference for this house?*" and "*How similar is this house to your ideal house?*" All items were answered on a 7-point scale. These five items were combined into a single measure of post-choice satisfaction, $\alpha = .87$, $N_{items} = 5$.

Socioeconomic Status. To assess subjective socioeconomic status (SES), we used eight items, adapted from past research (Griskevicius, Tybur, Delton, & Robertson, 2011), that addressed past, present, and future SES: "*My family usually had enough money for things when I was growing up*," "*I grew up in a relatively wealthy neighborhood*," "*I felt relatively wealthy compared to the other kids in my school*," "*My family struggled financially when I was growing up* (reverse-coded)," "*I have enough money to buy things I want*," "*I don't need to worry too much about paying my bills*," "*I don't have to worry about money too much in the future*," and "*I will be able to buy the things I need and want later in life*," $N_{items} = 8$, Cronbach's $\alpha = .83$. Participants responded on a 7-point scale that ranged from "*Strongly Disagree*" to "*Strongly Agree*." For our measure of *overall SES*, we took the mean of these eight items. Across all eight items, there was only one participant who did not respond, leaving 258 participants for whom we calculated this measure. It should be noted that four of these items were explicitly about childhood and that the four other items addressed current and future monetary concerns. Internal reliability was also high for both the childhood SES items, $N_{items} = 4$, Cronbach's $\alpha = .80$, and the combination of the three present-SES items and one future-SES item, $N_{items} = 4$, Cronbach's $\alpha = .79$.

Results

Decision Timing

Willingness to Delay (see Figure 1). Market Condition and Comparison Target did not interact to affect willingness to delay, $F(1, 255) = .79$, $p = .38$, $\eta^2_p = .003$, and

there was no main effect of Comparison Target, $F(1, 255) = .22$, $p = .64$, $\eta^2_p = .001$. There was, however, a main effect of Market Condition, $F(1, 255) = 8.23$, $p = .004$, $\eta^2_p = .031$, such that participants in the stable market ($M = 4.92$, $SD = 1.11$) were more willing to delay than participants in the seller's market ($M = 4.51$, $SD = 1.22$).

Willingness to Choose Immediately (see Figure 2). The two manipulated factors did not interact to affect willingness to choose a house immediately, $F(1, 255) = 1.69$, $p = .20$, $\eta^2_p = .007$, and there was no main effect of Market Condition, $F(1, 255) = .06$, $p = .80$, $\eta^2_p < .001$. Relative to participants in the control condition ($M = 4.64$, $SD = 1.25$), participants who pictured their ideal were more willing to choose immediately ($M = 5.08$, $SD = 1.18$), $F(1, 255) = 9.01$, $p = .003$, $\eta^2_p = .034$.

Immediate Offer or Delay (see Figures 7-8). The market and target factors did not interact to affect whether participants chose to delay or make an offer immediately, $\beta = -.60$, $SE = .55$, Wald = 1.19, $OR = .55$, $df = 1$, $p = .28$. There were, however, main effects of both Market Condition, $\chi^2(1, N = 259) = 6.64$, $p = .01$, and Comparison Target, $\chi^2(1, N = 259) = 8.44$, $p = .004$. A greater proportion of participants chose the delayed option in the stable market (72.7%) than did participants in the seller's market (57.5%; see Figure 7). The Comparison Target factor influenced decision making contrary to my prediction such that a greater proportion of participants in the control condition preferred the delayed option (74.0%) compared to those who pictured their ideal house (56.8%; see Figure 8).

Preference for Immediate or Delayed Utility (see Figures 3-5)

The two factors did not interact to affect ratings of future-oriented renovation options, ratings of present-oriented renovation options, or responses on the time preference measure (see Table 2). Similarly, there were no main effects of Market Condition or Comparison Target on these three measures.

House Choice (See Figures 9-10)

I predicted that a greater proportion of participants who had pictured their ideal would prefer the house with the better kitchen (The Bishop House) to the bigger house (The Rose House). The two factors did not interact to affect house choice, $\beta = .05$, $SE = .51$, Wald = .009, $df = 1$, $OR = 1.05$, $p = .93$, and there was no effect of Market Condition, $\chi^2(1, N = 259) = .80$, $p = .37$ (see Figure 9). There was, as predicted, a marginally significant main effect of Comparison Target, $\chi^2(1, N = 259) = 3.52$, $p = .06$, such that a greater proportion of participants who pictured their ideal house preferred the house with the better kitchen (63.5%) compared to participants in the control comparison condition (52.0%; see Figure 10).

Post-Choice Satisfaction (see Figure 6)

I predicted a main effect of Comparison Target, such that participants who pictured their ideal would report lower post-choice satisfaction than participants in the control condition. Consistent with this, the two manipulated factors did not interact, $F(1, 255) = .38$, $p = .54$, $\eta^2_p = .001$, and there was no main effect of Market Condition, $F(1, 255) = .20$, $p = .65$, $\eta^2_p = .001$. There was, in the opposite of the predicted direction, a

main effect of Comparison Target, $F(1, 255) = 9.58$, $p = .002$, $\eta^2_p = .036$, such that participants who pictured their ideal house reported greater post-choice satisfaction ($M = 5.36$, $SD = .81$) than did participants in the control condition ($M = 5.02$, $SD = .93$).

Summary of Primary Analyses

Overall, the results provided mixed support for the primary predictions. The prediction that resource conditions and reference point would interact to affect decision making was not supported, for any measure in this study.

The prediction that resource stability would lead to more of a future-oriented delay strategy relative to resource instability received some support. For instance, participants were more willing to delay when the market was stable, and a greater proportion of participants chose to delay making an offer when the market was stable. This manipulation, however, did not affect the other measures in this study, as had been expected.

The prediction that prototype matching would promote a delay strategy did not receive support. Participants in the ideal condition did not differ from those in the control condition in terms of willingness to delay, future orientation, present orientation, or time preference. Contrary to my prediction, participants who pictured their ideal were more willing to make an offer immediately and a greater proportion of them chose to do so.

The ancillary predictions received mixed support, as well. Consistent with my prediction concerning which features prototype matching would make salient and the corresponding influence on choice, participants who pictured their ideal preferred a house

with a better kitchen to a bigger house. This may be because the single bad kitchen feature in the bigger house was more salient when participants pictured their ideal. Of particular surprise, however, was the finding that participants who pictured their ideal were more satisfied relative to control. In contrast, we had predicted that prototype matching would lead individuals to rate the house they chose more negatively due to upward comparison.

Exploratory Analyses

From a life history perspective, childhood environment should have a profound effect on temporal psychological factors, such as temporal discounting, so it makes sense that it would impact the measures of interest in this study, as well. Past research has suggested that childhood SES is predictive of how participants respond to measures of risk preference and time preference after morality cues (Griskevicius, Tybur, Delton, & Robertson, 2011). As such, our exploratory analyses incorporated childhood SES into our measure of *overall SES*, which used items that focused on resources. These analyses examined the relation of overall SES to the primary dependent measures of interest and whether overall SES interacted with the experimental manipulations.

Overall SES and Willingness to Choose Immediately (see Figure 12 and Table 5). Our analyses revealed a three-way interaction among overall SES, Target, and Market that affected willingness to choose immediately, $\beta = -.55$, $t(250) = -2.02$, $p = .04$. To examine this interaction more closely, we analyzed the two-way interaction of Market by Target and the main effects of Target and Market one standard deviation below the mean,

at the mean, and one standard deviation above the mean. Coefficients and significance tests for each effect at each level of SES are given in detail in Table 5. In addition, there was a significant two-way interaction between Market and SES, β = .43, $t(250) = 2.25$, $p = .03$, and interaction between Target and SES was nonsignificant, β = .23, $t(250) = 1.20$, $p = .23$.

One standard deviation below the mean, there was a significant interaction between Market and Target, β = .96, $t(250) = 2.34$, $p = .02$, and a main effect of Market, β = -.65, $t(250) = -2.34$, $p = .02$. The relation between overall SES and willingness to choose immediately was strongest for participants in the Stable Market and Control Target conditions. Of participants who were in the Control Target condition, lower SES participants were more willing to choose immediately in the Stable Market and less willing to choose immediately in the Seller's Market. Of participants who were in the Ideal Target, lower SES participants showed the opposite pattern and were more willing to choose immediately in the Stable Market and less willing to choose immediately in the Seller's Condition. This interaction qualified the main effect of condition, whereby lower SES participants were generally more willing to choose immediately in the Seller's Market than in the Stable Market. The was not a significant main effect of Target, β = -.08, $t(250) = -.61$, $p = .54$

At the mean, there was no interaction between Market and Target, β = .37, $t(250) = 1.27$, $p = .21$, no main effect of Target, β = .23, $t(250) = 1.11$, $p = .27$, and no main effect of Market, β = -.19, $t(250) = -.92$, $p = .36$. One standard deviation above the mean,

there was a marginally significant main effect of Target, β = .48, $t(250) = 1.66$, $p = .099$, such that higher SES participants showed a stronger preference to choose immediately in the Ideal Target condition compared to the Control Target condition. The main effect of Market was nonsignificant, β = .27, $t(250) = .90$, $p = .37$, as was the interaction between Market and Target, β = -.22, $t(250) = -.54$, $p = .59$.

Taken together, these findings suggest that the effects of comparison target and resource conditions differ by socioeconomic status. The differences are most pronounced for lower SES participants, who are the least willing to choose immediately when in a stable environment and not picturing their ideal. When they are in a seller's market, picture their ideal, or both, they become more willing to choose immediately, a result which mirrors previous findings from Griskevicius and colleagues (2011). It could be the case that lower SES participants are less willing to act immediately, perhaps because scarce resources make salient the need to be cautious and deliberate, though they respond to cues in the environment by becoming more present oriented.

Overall SES and Time Preference (see Figure 11). Overall SES and Target interacted to affect time preference, β = -.59, $t(216) = -1.88$, $p = .06$. The effect of the comparison target manipulation on time preference differed by participants' overall SES. Lower SES individuals exhibited steeper discounting when primed to think about their ideal than did individuals from a more affluent environment. Simple slope analyses indicated that Target was a significant predictor one standard deviation below the mean of overall SES, β = 1.02, $t(216) = 2.14$, $p = .03$, but not at the mean, β = .39, $t(216) = 1.15$, p

= .25, or one standard deviation above the mean, β = -.24, $t(216) = -.51$, $p = .61$. These analyses indicated that the effect of the Target condition differed by overall SES, such that lower SES participants discounted more after picturing their ideal than they did in the control condition, but average and higher SES participants did not.

Significant Associations Between SES and Primary Measures (see Table 4). Analyses indicated that overall SES was positively related to ratings of future renovations, $r\ (257) = .28$, $p < .001$; willingness to choose immediately, $r\ (257) = .11$, $p = .08$; and self-reported post-choice satisfaction, $r\ (257) = .23$, $p < .001$. It was negatively correlated with willingness to delay, $r\ (257) = -.11$, $p = .08$, and time preference, $r\ (218) = -.16$, $p = .02$. Overall SES was not significantly correlated with ratings of present-oriented renovations, $r\ (257) = -.04$, $p = .53$, did not predict whether participants decided to choose immediately or delay, β = 1.54, $OR = .82$, Wald = 2.41, $df = 1$, $p = .12$, or which house participants chose, β = .36, $OR = .99$, Wald = .01, $df = 1$, $p = .53$.

General Discussion

In this investigation, we tested how comparison target and environmental factors that cue resource availability or scarcity affect decision making processes, attention, utility preferences, and choice. We expected that comparing available options to an ideal would lead individuals to adopt a more future-oriented delay strategy when resources were stable, but that doing so would have less of an impact when resources were scarce. We reasoned that a salient ideal would generally promote a more future-oriented strategy,

but that this would not emerge in environments where implementing a delay strategy would be detrimental, such as when particular resources were scare or unstable.

Overall, the findings provided mixed support for these predictions. Although the two factors did not interact to affect decision strategies or utility preferences as predicted, other predictions were supported by these data. For instance, participants were more willing to delay when the market was stable, and a greater proportion of participants chose to delay making an offer when the market was stable. In addition, participants who pictured their ideal preferred a house with a better kitchen to a bigger house. This may be because the single bad kitchen feature in the bigger house was more salient when participants pictured their ideal. Of particular surprise, however, was the finding that participants who pictured their ideal reported higher post-choice satisfaction than did participants in the control condition. In contrast, we had predicted that picturing one's ideal would lead individuals to rate the house they chose more negatively due to the downward comparison from ideal to chosen house.

One methodological issue that may have impacted the results of this study concerns aspects of the experimental design in which participants reported their preferences and were shown houses consistent with those preferences. In real life, the options available to us are not always desirable options, not always options that are consistent with our preferences. Giving participants house options that were consistent with their preferences on two major dimensions–size and number of bedrooms–may have had unintended and detrimental effects. Specifically, this may have removed much of the

incentive for delay that normally exists in more ecologically-valid environments. One common reason to delay while house hunting would be to wait for better options to come on the market, options that are more consistent with what you are looking for. The experimental design obviated this common and compelling reason to wait by providing desirable, preference-consistent options. Another good reason to delay making an offer in more ecologically-valid circumstances is to acquire more resources in order to obtain a better house. This powerful reason to delay was also absent from our design. These aspects of the design may have made adopting a long-term strategy less appealing and may limit the generalizability of these findings due to the lack of important features that would be present in more ecologically-valid settings. To address this limitation, one future direction of this research would be to implement a research design in which participants are presented with undesirable options, or options that at least fall short of their preferences. In addition, the study design could add more of an incentive to delay, such as greater resources at later time or a stronger assurance that better options would become available in the future.

A second issue with this study concerns the sample population we used– undergraduate students at a large, public university. Characteristics of the sample population may have affected how participants responded to the scenario and the findings of this study. College students have a reputation for living in modest, if not humble, accommodations. Also, and perhaps more importantly, few individuals in this population have experience with purchasing a house. As a result, the house options that were given

to them may have sounded far more appealing than they were intended to. In fact, all the options they saw may have exceeded what they imagined their current ideal living conditions to be, which for many college students is to simply have their own room, let alone a three bedroom house, or even a five bedroom house. This is problematic because it affects the type of comparison participants would have been making. We had reasoned that picturing an ideal would lead individuals to take more of a long-term strategy because the comparison from their current options to their ideal would be an upward comparison and it would have likely been salient to them that they could obtain a better outcome if they delayed. Contrary to this, if the options presented to participants exceeded the ideal they pictured, they would have been making a downward comparison from the options available to their ideal, making the options available even more appealing, and likely eliminating any inclination to delay. This interpretation is consistent with the finding that participants in the ideal condition were more satisfied with the chosen house and were more willing to make an offer immediately. To address this issue, a possible future direction of this research would be to use a community sample (perhaps a PTA) or an MTurk sample in order to include more adults with house purchasing experience, and whose ideal houses are nicer than the ones presented to them in the study. Alternatively, if we wanted to continue using an undergraduate sample, we could make the task dingy apartment hunting instead of house hunting; this would be closer to the actual experience and accommodations of our sample.

A third potential problem concerns aspects of the experimental design related to the comparison target manipulation or that may have affected the comparison target manipulation. It may have been problematic that participants read about the house hunting task and the budget that they would be allocated *before* they completed the comparison target manipulation; participants in the ideal comparison target condition may have pictured an appropriate ideal for the task at hand, and for the known budget not their ultimate ideal. Importantly, this imagined ideal may have an attainable ideal, given the resources they would have available to them, or closer to an attainable ideal than it would have been had they been instructed to picture their ideal house before reading about the house hunting task. The budget may have bounded what they pictured for their ideal. Because of this, what they pictured may have been similar to the options that were presented to them during the scenario. Instead of promoting downward comparison from the ideal to the option, the ideal comparison target may have actually made salient the consistency between the imagined (attainable) ideal and the options available to participants. Finally, the ideal comparison target manipulation may have done more than simply get people to think about their ideal house; it may have also primed participants to think about house hunting and what they might want more generally. That is, it may have helped participants prepare for the task and enabled them to be more decisive and confident in their choices, which may partially explain why those participants were more satisfied in the ideal comparison target condition contrary to what had been predicted.

The findings from this study may have some interesting implications and applications. Perhaps most intriguing were the unexpected findings that participants who pictured their ideal house were more willing to choose immediately, preferred to choose immediately, and were more satisfied with the house they chose. When considered within the context of the study and the post-hoc criticisms of the study design, these findings may imply an important boundary condition; these findings may suggest that the consequences of picturing one's ideal actually leads to greater impulsivity and present-oriented decision making when that ideal feels attainable or near attainable. It remains an empirical question whether the attainability of an imagined ideal affects its influence on the decision process, though this may be a viable avenue for further investigation. This finding and proposed avenue of research would be highly relevant to advertisers and marketers. If making an immediately-attainable ideal salient leads to more present-oriented choice and making a not-immediately-attainable ideal salient leads to preference to delay, it would have important implications for how advertisers and marketers frame their products to consumers.

Overall, this study does lend support to the prediction that stable resources, as opposed to unstable resources, promote preference for delayed choice. It also lends support to the prediction that picturing one's ideal affects choice by influencing which features are salient. The null and unexpected findings, however, do suggest that this study could have been improved in several ways. The particular decision scenario in this study may have been more appropriate for an older audience, both because an older audience

would be more likely to be acquainted with house hunting and because there would likely be less of a contrast between current living conditions and the houses being evaluated, compared to the college sample that was used. There were improvements that could have been made to the manipulations. The market manipulations could have been more detailed, more parallel, and more explicit about the characteristics of each housing market; for instance, it was implied that there were fewer resources and greater scarcity in the seller's market, though the prompt focused on competition among buyers and how fast houses were being sold. The ideal comparison condition, too, could have been improved by having participants complete it before they knew about the decision task and the parameters of the resources they would be given. Those changes could make it more likely that they would picture an ideal that would be far more grand than the options available to them, an ideal that would get them to think more to what could be available in the future. Future research could also more closely examine the role of childhood and current SES as a moderator of these decision processes. Our exploratory analyses found that this factor interacted with our manipulations in a way that appeared to be mostly consistent with life history theory. In sum, this study provided preliminary, mixed support for some of our hypotheses and also highlighted promising, related avenues for future research.

References

Agostinelli, G., Sherman, S. J., Fazio, R. H., & Hearst, E. S. (1986). Detecting and identifying change: Additions versus deletions. Journal of Experimental Psychology: Human Perception and Performance, 12(4), 445-454.

Bartels, D. M., & Urminsky, O. (2011). On intertemporal selfishness: How the perceived instability of identity underlies impatient consumption. *Journal of Consumer Research, 38*(1), 182-198.

Belsky, J., Schlomer, G.L., & Ellis, B.J. (2012). Beyond cumulative risk: Distinguishing harshness and unpredictability as determinants of parenting and early life history strategy. *Developmental Psychology 48(3),* 662-673.

Carter, T. J., & Gilovich, T. (2010). The relative relativity of material and experiential purchases. Journal of Personality and Social Psychology, 98(1), 146-159.

Daly, M., & Wilson, M. (2005). Carpe diem: Adaptation and devaluing the future. *The Quarterly Review of Biology 80(1),* 55-60.

Diab, D. L., Gillespie, M. A., & Highhouse, S. (2008). Are maximizers really unhappy? The measurement of maximizing tendency. *Judgment and Decision Making, 3(5)*, 364-370.

Ersner-Hershfield, H., Garton, M.T., Ballard, K., Samanez-Larkin, G.R., & Knutson, B. (2009). Don't stop thinking about tomorrow: Individual differences in future self-continuity account for saving. *Judgment and Decision Making, 4(4)*, 280-286.

Esswein, P.M. (2014). 2014 housing outlook: Home prices head higher. Retrieved from http://www.kiplinger.com/article/real-estate/T010-C000-S002-housing-outlook-2014.html

Goldstein, D.G., & Gigerenzer, G. (2002). Models of ecological rationality: The recognition heuristic. Psychological Review, 109(1), 75-90.

Griskevicius, V., Tybur, J.M., Delton, A.W., & Robertson, T.E. (2011). The influence of mortality and socioeconomic status on risk and delayed rewards: A life history theory approach. *Journal of Personality and Social Psychology 100(6),* 1015-1026.

Hershfield, H.E. (2011). Future self-continuity: how conceptions of the future self transform intertemporal choice. Annals of the New York Academy of Sciences 1235, 30-43.

Hershfield, H.E., Goldstien, D.G., Sharpe, W.F., Fox, J., Yeykelis, L., Carstensen, L.L., & Bailenson, J.N. (2011). Increasing saving behavior through age-progressed renderings of the future self. *Journal of Marketing Research 48,* 23-37.

Botti, S. & Iyengar, S. S. (2004). The Psychological Pleasure and Pain of Choosing: When People Prefer Choosing at the Cost of Subsequent Outcome Satisfaction. *Journal of Personality and Social Psychology*, *87* (3), 312-326.

Iyengar, S.S., Wells, R.E., & Schwartz, B. (2006). Doing better but feeling worse: Looking for the "best" job undermines satisfaction. *Psychological Science, 17(2),* 143-150.

Joireman, J., Balliet, D., Sprott, D., Spangenberg, E., & Schultz, J. (2008). Consideration of future consequences, ego-depletion, and self-control: Support for distinguishing between CFC-Immediate and CFC-Future sub-scales. *Personality and Individual Differences*, *45*, 15-21.

Joshi, P. D., & Fast, N. J. (2013). Power and reduced temporal discounting. *Psychological Science, 24*(4), 432-438.

Krueger, D.J., Reischl, T., & Zimmerman, M.A. (2008). Time perspective as a mechanism for functional developmental adaptation. Journal of Social, Evolutionary, and Cultural Psychology 2(1), 1-22.

Mills, J., Meltzer, R., & Clark, M. (1977). Effect of number of options on recall of information supporting different decision strategies. Personality and Social Psychology Bulletin, 3(2), 213-218.

Schwartz, B., Ward, A., Monterosso, J., Lyubomirsky, S., White, K., & Lehman, D. R. (2002). Maximizing versus satisficing: Happiness is a matter of choice. *Journal of Personality and Social Psychology, 83(5)*, 1178-1197.

Simon, H.A. (1955). A behavioral model of rational choice. *The Quarterly Journal of Economics, 69(1),* 99-118.

Simon, H.A. (1956). Rational choice and the structure of the environment. *Psychological Review, 63(2),* 129-138.

Simon, H.A. (1957). *Models of man, social and rational: Mathematical essays on rational human behavior. New York: Wiley.*

Todd, P. M., & Gigerenzer, G. (2003). Bounding rationality to the world. *Journal of Economic* Psychology, 24(2), 143-165.

Turner, B. M., Rim, H. B., Betz, N. E., & Nygren, T. E. (2012). The maximization inventory. Judgment and Decision Making, 7(1), 48-60.

Tversky, A. (1977). Features of similarity. *Psychological Review, 84(4)*, 327-352.

Tversky, A., & Shafir, E. (1992). Choice under conflict: The dynamics of deferred decision. Psychological Science, 3(6), 358-361.

Weber, E. U., Johnson, E. J., Milch, K. F., Chang, H., Brodscholl, J. C., & Goldstein, D. G. (2007). Asymmetric discounting in intertemporal choice: A query-theory account. *Psychological Science, 18(6)*, 516-523.

Wilson, M., & Daly, M. (2004). Do pretty women inspire men to discount the future? *Proceedings of the Royal Society B: Biological Sciences*, *271*(Suppl 4), S177–S179.

APPENDIX I

MANIPULATIONS

IV #1: MARKET CONDITION

To manipulate cues of resource stability or resource instability, participants were randomly to one of two housing markets: stable market or seller's market. The general instructions that participants read contained this manipulation.

STABLE MARKET. Participants read the following instructions:

> In this scenario, imagine that you are shopping for a house. You will be given a budget of $215,000 and shown a selection of houses in your price range on which you can make an offer. The housing market is currently stable. There is balance between the number of people looking to buy a house and the number of people trying to sell their house. As a result, there is normal turnover of houses. Houses currently listed as on sale are being sold within a month or two, and new houses are regularly coming on the market.

SELLER'S MARKET. Participants read the following instructions:

> In this scenario, imagine that you are shopping for a house. You will be given a budget of $215,000 and shown a selection of houses in your price range on which you can make an offer. The housing market is currently in a "Seller's Market." For buyers, this means that there is competition for the houses currently on the market. As a result, house shoppers should consider the options that are available because houses currently listed as on sale are being sold within days of coming on the market.

IV #2: COMPARISON TARGET

To manipulate comparison target, which may in turn influence decision strategy, participants were assigned to a control condition or were told to picture their ideal house.

CONTROL CONDITION. On the screen after the instructions, participants read the following: “On the next screen, you will start house hunting. Please click the next button when you are ready to begin.”

IDEAL CONDITION. On the screen after the instructions, participants read the following: “Before you start looking at houses, take a minute and imagine your ideal house. Think about what it looks like. Think about what features are important to you. Take a minute and picture this house and what it feels like to live there.” Second, participants read “Tell us a few details about the house you imagined that were particularly vivid.” and provided a written response. Third, participants were able to check boxes indicating which features were in the kitchen they imagined. These features included what the refrigerator looked like, what the counters looked like, what the cabinets looked like, and the type of layout.

APPENDIX II

MEASURES

HOUSE PREFERENCE

Participants were asked to indicate their preference for house size. They chose between three options: 3 or fewer bedrooms and less than 1500 sq. ft., 4 bedrooms and 15-2500 sq. ft., and 5 or more bedrooms and more than 2500 sq. ft.; this choice affected the characteristics of the housing options they were presented with.

SELECTING A HOUSE

After selecting their preferred size of house, participants read the following: "There are two houses listed below, each with some listing information. They are identified by the last names of their owners. When you make an offer, you will identify the house you want to bid on by the name of the house. Square footages have been rounded to the nearest -50 or -00." Participants then rated each house for attractiveness on a seven-point Likert scale.

THE ROSE HOUSE. "This house is X square feet and has Y bedrooms. The kitchen features stainless steel appliances, laminate countertops, and an open layout with an island."

THIS BISHOP HOUSE. "This house is X square feet and has Y bedrooms. The kitchen features stainless steel appliances, granite countertops, and an open layout with an island."

DIFFERENCES DEPENDING ON HOUSE PREFERENCE. Here, X and Y depended on the house size preferences that the participant previously selected. When

participants indicated preference for a small house, the Rose House was 1450 square feet and three bedrooms, while the Bishop House was 1200 square feet and three bedrooms. When preference for a mid size home was selected, the Rose House was 2350 square feet and four bedrooms, while the Bishop House was 2100 square feet and four bedrooms. When a larger house was preferred, the Rose House was 2950 square feet and 5 bedrooms, while the Bishop House was 2700 square feet and 5 bedrooms.

DECISION TIMING

Participants were first informed “You may make an offer on one of these houses immediately or choose to delay making an offer. If you delay making an offer, you will be able to look at more houses. While you are looking at additional houses, these houses may be sold.” On a seven-point Likert scale, participants rated their willingness for the following question: “How willing would you be to delay making an offer on one of these houses?”On a seven-point Likert scale, participants rated their willingness for the following question: “How willing would you be to make an offer on one of these houses immediately?”After indicating their willingness to delay making an offer and willingness to make an offer immediately, participants then choose if they wanted to make an offer on a house immediately or delay making an offer and look at more houses.

FUTURE AND PRESENT ORIENTATION

To measure participant's time orientation, they were given eight different renovations to make on the house they selected, and asked to rate the attractiveness of each on a seven-point Likert scale. Four of the renovations were more future oriented and

included cues of longevity and build quality, though they were limited in scope. Four of the renovations were more present oriented and larger in scope, though only used mid-grade materials or did not last as long. The options included the following choices:

• Repaint the living room and kitchen with inexpensive, mid-grade paint that lasts 3-5 years before needing retouching

• Repaint the kitchen with high-end custom paint that resists stains and lasts 8-10 years before needing retouching,

• Renovate all the bathrooms with mid-grade materials

•Renovate the master bathroom with the highest quality materials

• an entire living room set from Ikea

• a high-end sofa from Herman Miller

• Replace the carpet in the master bedroom with natural, solid hardwood. Solid hardwood flooring is milled from a single 3/4" piece of hardwood. It can be sanded and refinished over several generations of use.

• Replace the carpet in all of the bedrooms with faux wood floor paneling. Faux wood is manufactured by pressing layers of composite wood together at high temperatures. Though durable, faux wood cannot be refinished and has to be replaced if worn or blemished.

POST-CHOICE SATISFACTION

To measure post-choice satisfaction, participants were asked to rate the following on a seven-point Likert scale: “How satisfied are you with the offer you have made?” “How confident are you that you made the right choice about which house to make an offer on?” “How much do you like the house you made an offer on?” “How strong is your preference for this house?” and “How similar is this house to your ideal house?”

TIME PREFERENCE

To assess whether the effects of the manipulations lasted and generalized beyond the specific context of house hunting, this study included a previously-validated measure of time preference (Weber, Johnson, Milch, Chang, Brodscholl, & Goldstein, 2007). Though temporal discounting has been described as a trait-level construct, several studies in the past decade have demonstrated that discount rates and discount factors are sensitive and susceptible to experimental manipulations (e.g., Bartels & Urminsky, 2011; Wilson & Daly, 2004; and Joshi & Fast, 2013). As such, we would expect this measure of time preference to be similarly influenced by our manipulations. Because our pilot testing revealed an effect of the order participants were told to think about immediate rewards and delayed rewards, we included two versions that counterbalanced the order then collapsed across them.

VERSION A. “Imagine that you are going to be given a $50 Amazon gift card (GC) today. You are given the choice of the gift card immediately or a 95% chance of receiving a gift card of larger amount 3 months from now. Indicate whether you would

prefer a 95% chance for a gift card of each amount listed below to be received 3 months from now, or a $50 gift card immediately. For each amount (each row), please select one of the two options." The left side of each row described a 95% chance of receiving a gift card of various amounts, ranging from $50-$100 in $5 increments. On the right side was the choice to receive the $50 gift card immediately.

VERSION B. "Imagine that you are going to be given a $50 Amazon gift card (GC) today. You are given the choice of a 95% chance of receiving a gift card of larger amount 3 months from now, or of the gift card immediately. Indicate whether you would prefer the $50 gift card immediately or a 95% chance for a gift card of each amount listed below to be received 3 months from now. For each amount (each row), please select one of the two options." The left side of each row was the choice to receive the $50 gift card immediately, while the right side of each row described a 95% chance of receiving a gift card of various amounts, ranging from $50-$100 in $5 increments.

APPENDIX III

ANALYSES

Table 1

Zero-order correlations, means, and standard deviations for continuous decision strategy measures.

Measure	1	2	3	4	5	*M*	*SD*
1. Delay	–					4.72	1.18
2. Future Ren	-.12*	–				5.10	1.03
3. Immediate	-.36***	.18**	–			4.86	1.18
4. Present Ren	-.07	-.04	-.02	–		3.93	1.08
5. Discounting	.04	-.04	.08	.04	–	5.45	2.54
6. PCS	-.15*	.27***	.46***	.07	.02	5.19	.88

Note: Delay = willingness to delay making an offer; Future Ren = average ratings of future-oriented renovations; Immediate = willingness to choose immediately; Present Ren = average ratings of present-oriented renovations; Discounting = time preference measure; PCS = post-choice satisfaction. For correlations with Discounting, $N = 220$; for all other correlations, $N = 259$.
* $p < .05$, ** $p < .01$, *** $p < .001$.

Table 1a

Zero-order correlations, means, and standard deviations for continuous decision strategy measures.
Condition: Stable Market x Control Comparison

Measure	1	2	3	4	5	*M*	*SD*
1. Delay	–					4.89	1.01
2. Future Ren	-.190	–				5.06	1.03
3. Immediate	-.32**	.15	–			4.53	1.24
4. Present Ren	-.08	-.04	-.12	–		4.04	1.06
5. Discounting	-.03	-.13	.00	.13	–	5.26	2.78
6. PCS	-.18	.31*	.30*	.11	-.14	4.97	.86

Note: Delay = willingness to delay making an offer; Future Ren = average ratings of future-oriented renovations; Immediate = willingness to choose immediately; Present Ren = average ratings of present-oriented renovations; Discounting = time preference measure; PCS = post-choice satisfaction. For correlations with Discounting, $N = 55$; for all other correlations, $N = 66$.
* $p < .05$, ** $p < .01$.

Table 1b

Zero-order correlations, means, and standard deviations for continuous decision strategy measures.
Condition: Stable Market x Ideal Comparison

Measure	1	2	3	4	5	*M*	*SD*
1. Delay	–					4.95	1.21
2. Future Ren	-.01	–				5.09	1.01
3. Immediate	-.26*	.18	–			5.15	1.06
4. Present Ren	-.15	.07	-.03	–		3.83	1.08
5. Discounting	-.02	-.22	-.02	-.30*	–	5.78	2.37
6. PCS	-.06	.22	.50**	.15	.05	5.37	.85

Note: Delay = willingness to delay making an offer; Future Ren = average ratings of future-oriented renovations; Immediate = willingness to choose immediately; Present Ren = average ratings of present-oriented renovations; Discounting = time preference measure; PCS = post-choice satisfaction. For correlations with Discounting, $N = 55$; for all other correlations, $N = 66$.
* $p < .05$, ** $p < .01$.

Table 1c

Zero-order correlations, means, and standard deviations for continuous decision strategy measures.
Condition: Seller's Market x Control Comparison

Measure	1	2	3	4	5	*M*	*SD*
1. Delay	–					4.61	1.28
2. Future Ren	-.16	–				4.95	1.08
3. Immediate	-.44**	.13	–			4.75	1.26
4. Present Ren	-.11	-.12	.06	–		3.88	1.07
5. Discounting	.08	.11	.163	.16	–	5.33	2.57
6. PCS	-.26*	.24	.51**	-.06	-.02	5.08	1.00

Note: Delay = willingness to delay making an offer; Future Ren = average ratings of future-oriented renovations; Immediate = willingness to choose immediately; Present Ren = average ratings of present-oriented renovations; Discounting = time preference measure; PCS = post-choice satisfaction. For correlations with Discounting, $N = 55$; for all other correlations, $N = 66$.
* $p < .05$, ** $p < .01$.

Table 1d

Zero-order correlations, means, and standard deviations for continuous decision strategy measures.
Condition: Seller's Market x Ideal Comparison

Measure	1	2	3	4	5	*M*	*SD*
1. Delay	–					4.41	1.16
2. Future Ren	-.10	–				5.30	.99
3. Immediate	-.44**	.27*	–			5.00	1.08
4. Present Ren	.05	-.06	.02	–		3.95	1.12
5. Discounting	.10	.05	.11	.13	–	5.42	2.42
6. PCS	-.07	.29*	.47**	.14	.20	5.35	.77

Note: Delay = willingness to delay making an offer; Future Ren = average ratings of future-oriented renovations; Immediate = willingness to choose immediately; Present Ren = average ratings of present-oriented renovations; Discounting = time preference measure; PCS = post-choice satisfaction. For correlations with Discounting, $N = 55$; for all other correlations, $N = 66$.
* $p < .05$, ** $p < .01$.

Table 2

Analyses of Measures Subjected to a 2x2 Between-Subjects ANOVA

Measure		Market Condition	Comparison Target	Market*Target
1. Willingness to delay making an offer	$F(1, 255)$	**8.23**	.22	.79
	p	**.004**	.64	.38
	η^2_p	**.031**	.001	.003
2. Willingness to make offer immediately	$F(1, 255)$	.06	**9.01**	1.69
	p	.80	**.003**	.20
	η^2_p	< .001	**.034**	.007
3. Ratings of future-oriented renovations	F	.16	2.25	1.59
	p	.69	.14	.21
	η^2_p	.001	.009	.006
4. Ratings of present-oriented renovations	$F(1, 255)$	.01	.28	1.15
	p	.91	.60	.29
	η^2_p	< .001	.001	.004
5. Time Preference	$F(1, 216)$	.18	.78	.41
	p	.67	.38	.52
	η^2_p	.001	.004	.002
6. Post-choice satisfaction	$F(1, 255)$	.20	**9.58**	.38
	p	.65	**.002**	.54
	η^2_p	.001	**.036**	.001

Note: Significant effects are bolded.

Table 3

Main Effects of Market Condition and Comparison Target: Means and Standard Deviations

Measure	Seller's Market	Stable Market	Control (No Target)	Ideal Target
1. Willingness to delay making an offer	**4.51 (1.22)**	**4.92 (1.11)**	4.76 (1.15)	4.68 (1.21)
2. Willingness to make offer immediately	4.88 (1.17)	4.84 (1.19)	**4.63 (1.25)**	**5.08 (1.07)**
3. Ratings of future-oriented renovations	5.13 (1.05)	5.07 (1.01)	5.00 (1.05)	5.19 (1.00)
4. Ratings of present-oriented renovations	3.92 (1.10)	3.94 (1.07)	3.96 (1.07)	3.89 (1.10)
5. Time Preference	5.37 (2.49)	5.51 (2.59)	5.29 (2.67)	5.60 (2.39)
6. Post-choice satisfaction	5.22 (.89)	5.17 (.87)	**5.02 (.93)**	**5.36 (.81)**

Note: Significant differences are bolded. Means are in the free space of each cell; standard deviations are in parentheses.

Table 4

Zero-order correlations of continuous decision strategy measures with overall SES.

Measure	Delay	FutureRen	Immediate	PresentRen	Discounting	PCS
Childhood SES	-.10	.29***	.07	-.09	-.10	.18**
Current/Future SES	-.09	.19**	.12 †	.02	-.17*	.21**
Overall SES	-.11 †	.28***	.11 †	-.04	-.16**	.23***

Note: Delay = willingness to delay making an offer; Future Ren = average ratings of future-oriented renovations; Immediate = willingness to choose immediately; Present Ren = average ratings of present-oriented renovations; Discounting = time preference measure; PCS = post-choice satisfaction. For correlations with Discounting, $N = 220$; for all other correlations, $N = 259$.
† $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 5

Simple Slope Analysis of Three-way Interaction Among Target, Market, and Overall SES to Affect Willingness to Choose Immediately

Slope Location	Effect	β	*t*	*p*
One standard deviation below the mean of overall SES	Target	-.08	-.05	.96
	Market	**-.65**	**-2.34**	**.02**
	SES	-.08	-.61	.54
	Target*Market	**.96**	**2.34**	**.02**
	Target*SES	.23	1.20	.23
	Market*SES	**.43**	**2.25**	**.03**
At the mean of overall SES	Target	.23	1.11	.27
	Market	-.19	-.92	.36
	SES	-.08	-.61	.54
	Target*Market	.37	1.27	.21
	Target*SES	.23	1.20	.23
	Market*SES	**.43**	**2.25**	**.03**
One standard deviation above the mean of overall SES	Target	**.48**	**1.66**	**.099**
	Market	.27	.90	.37
	SES	-.08	-.61	.54
	Target*Market	-.22	-.54	.59
	Target*SES	.23	1.20	.23
	Market*SES	**.43**	**2.25**	**.03**

Note: All continuous predictors centered. Significant effects bolded.

Figure 1

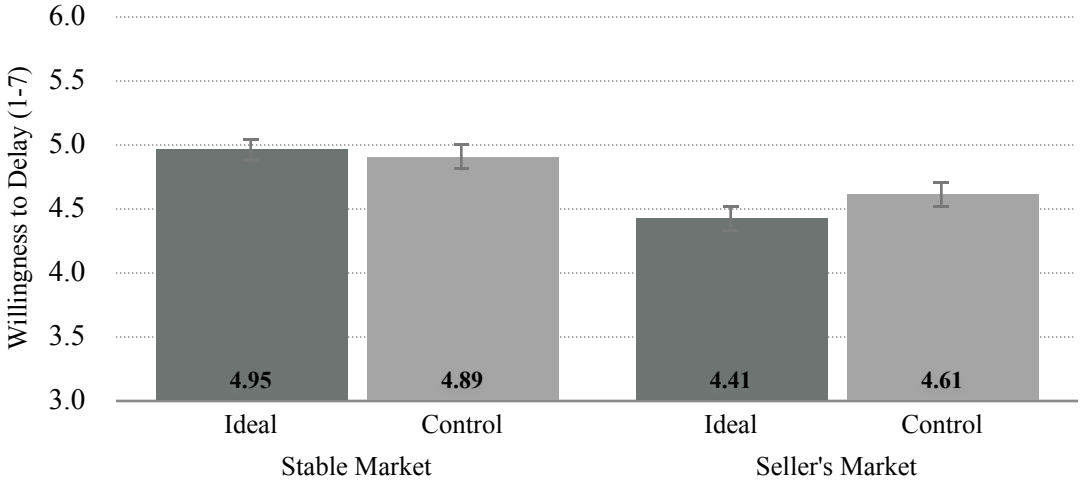

Figure 1: The Effect of Market Condition and Comparison Target on Willingness to Delay

Though the two factors did not interact, and the main effect of Comparison Target was nonsignificant, there was a main effect of Market Condition such that participants in the stable market were more willing to delay than participants in the seller's market.

Figure 2

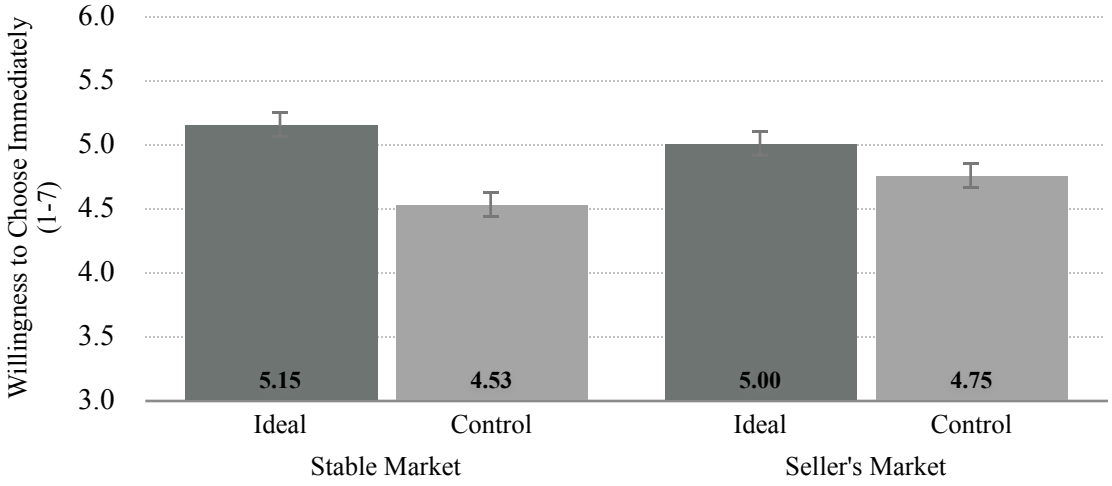

Figure 2: The Effect of Market Condition and Comparison Target on Willingness to Make Offer Immediately

The interaction of the two factors was nonsignificant, as was the main effect of Market Condition. There was, however, a main effect of Comparison Target, such that participants who pictured their ideal were more willing to make an offer immediately than participants in the control condition.

Figure 3

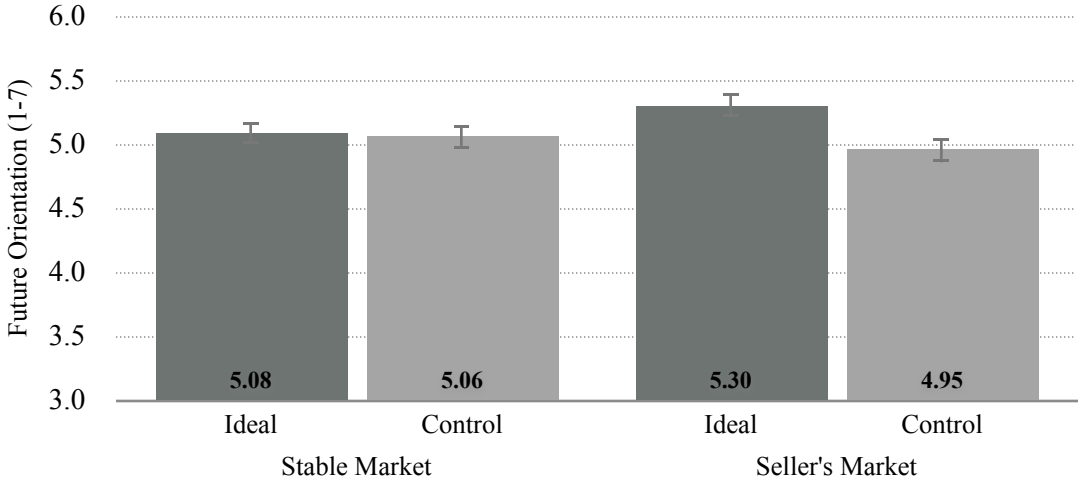

Figure 3: The Effect of Market Condition and Comparison Target on Future Orientation

The two manipulations did not affect future orientation and did not interact to affect future orientation.

Figure 4

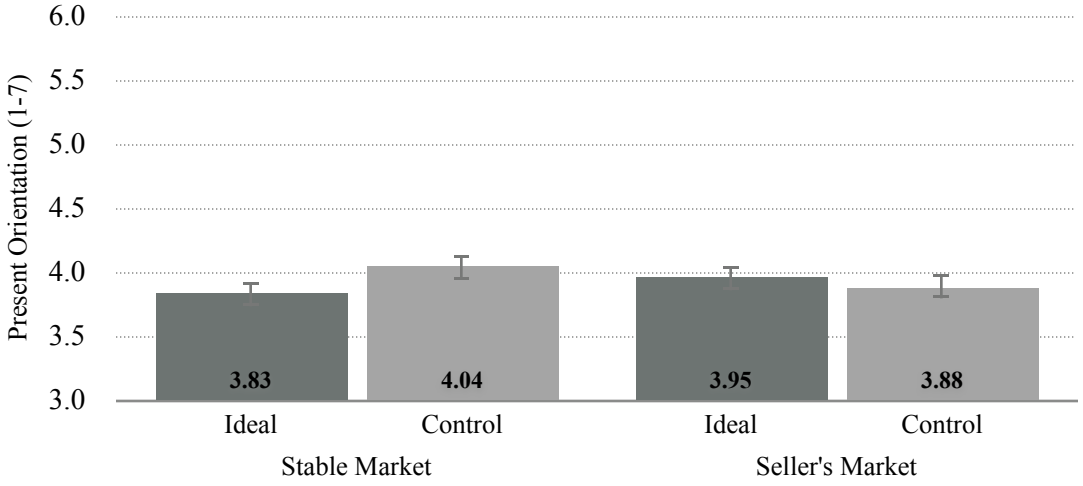

Figure 4: The Effect of Market Condition and Comparison Target on Present Orientation

The two manipulations did not affect present orientation and did not interact to affect present orientation.

Figure 5

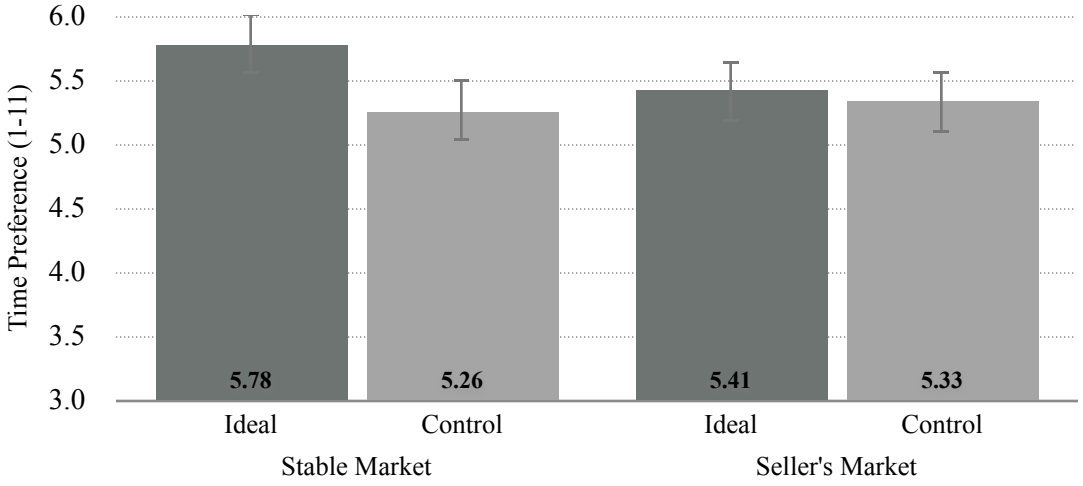

Figure 5: The Effect of Market Condition and Comparison Target on Time Preference

The two manipulations did not affect time preference and did not interact to affect time preference.

Figure 6

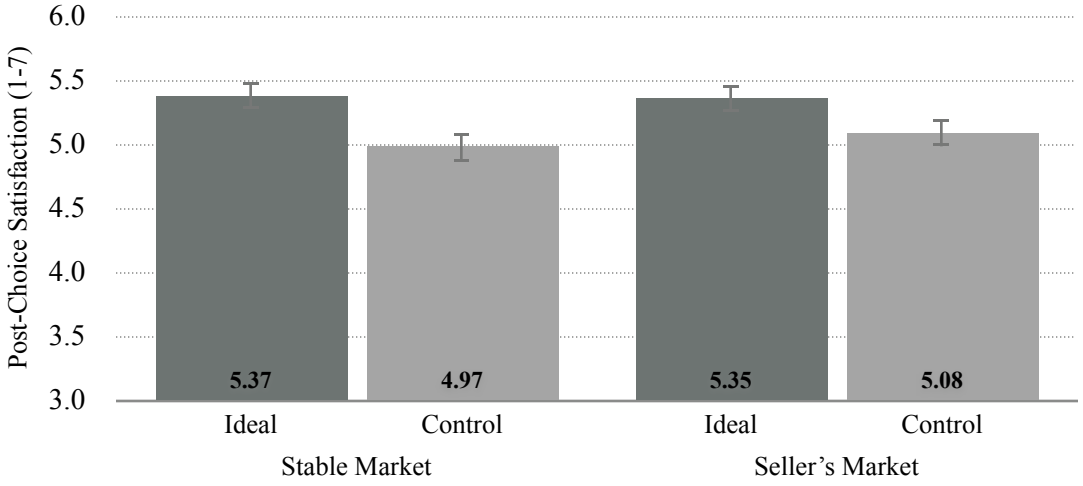

Figure 6: The Effect of Market Condition and Comparison Target on Post-Choice Satisfaction

There was a main effect of Comparison Target, such that participants who pictured their ideal were more satisfied with their chosen house than did participants in the control condition. There was no main effect of Market Condition, and the interaction between the two factors was nonsignificant.

Figure 7

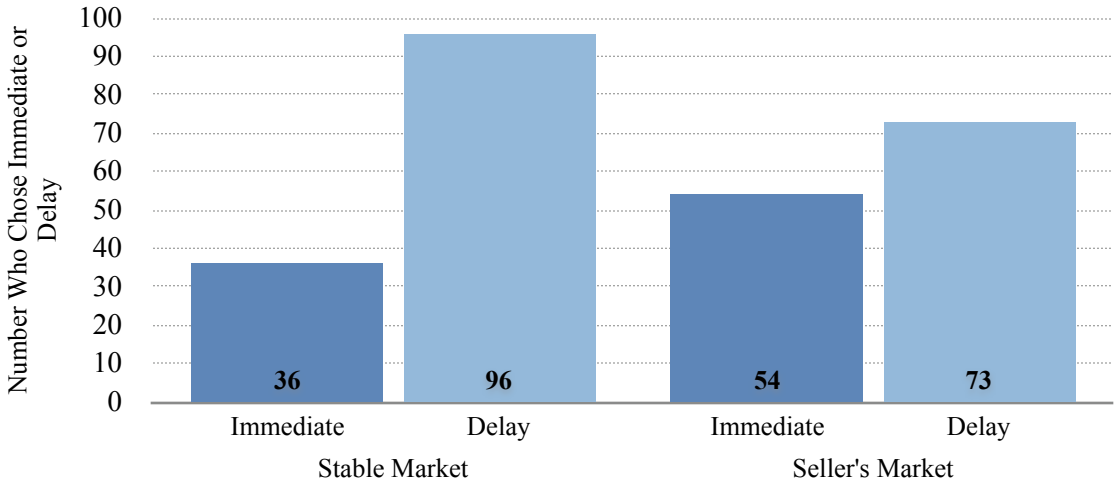

Figure 7: Effect of Market Condition on Decision to Make Offer Immediately or Delay

Market Condition had a significant effect on offer timing choice, $\chi^2(1, N = 259) = 6.64$, $p = .01$, such that a greater proportion of participants chose to delay in the stable market (72.7%) compared to the seller's market (57.5%).

Figure 8

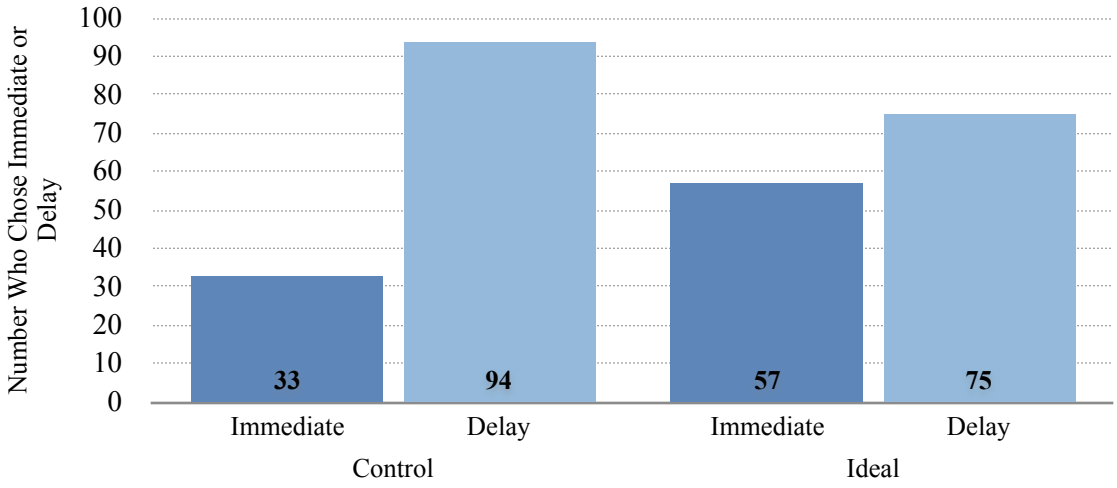

Figure 8: Effect of Comparison Target on Decision to Make Offer Immediately or Delay

Comparison Target had a significant effect on offer timing choice, $\chi^2(1, N = 259) = 8.44$, $p = .004$, such that a greater proportion chose to delay in the control condition (74.0%) compared to the ideal condition (56.8%).

Figure 9

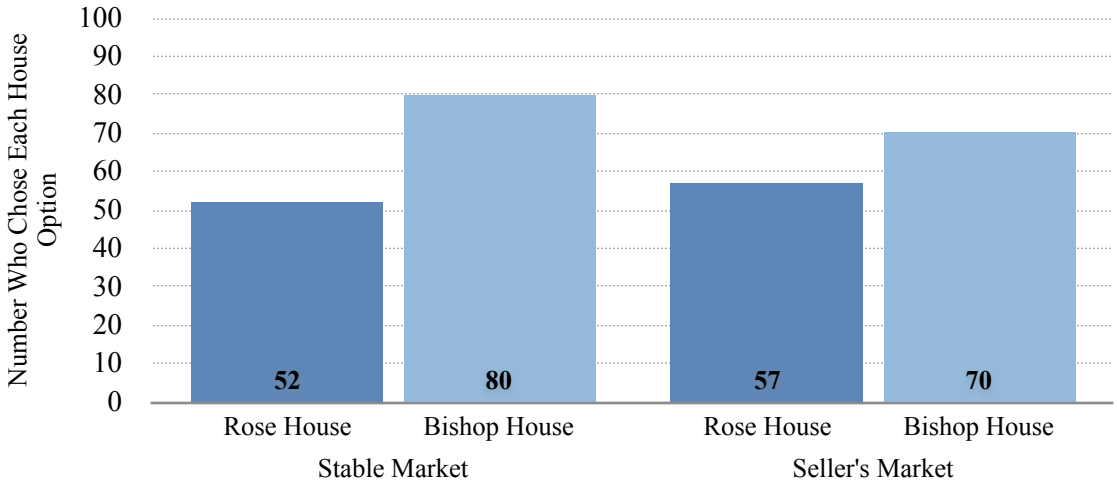

Figure 9: Effect of Market Condition on House Choice

Market Condition did not affect house choice, $\chi^2(1, N = 259) = .80, p = .371$.

Figure 10

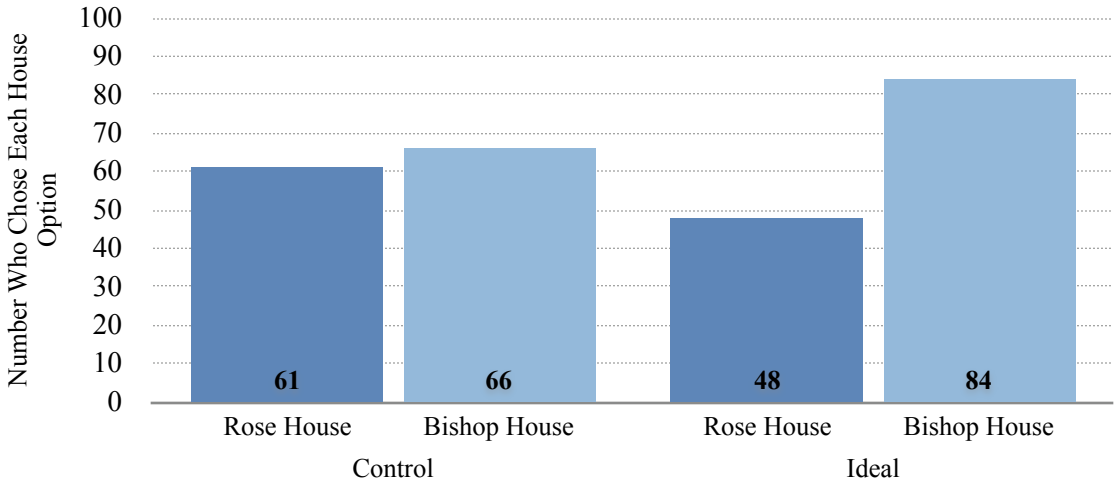

Figure 10. Effect of Comparison Target on House Choice

Comparison Target had a marginally significant effect on house choice, $\chi^2(1, N = 259) = 3.52$, $p = .057$, such that a greater proportion chose the Bishop House, the house with the better kitchen, after picturing their ideal (63.5%) compared to the control condition (52.0%).

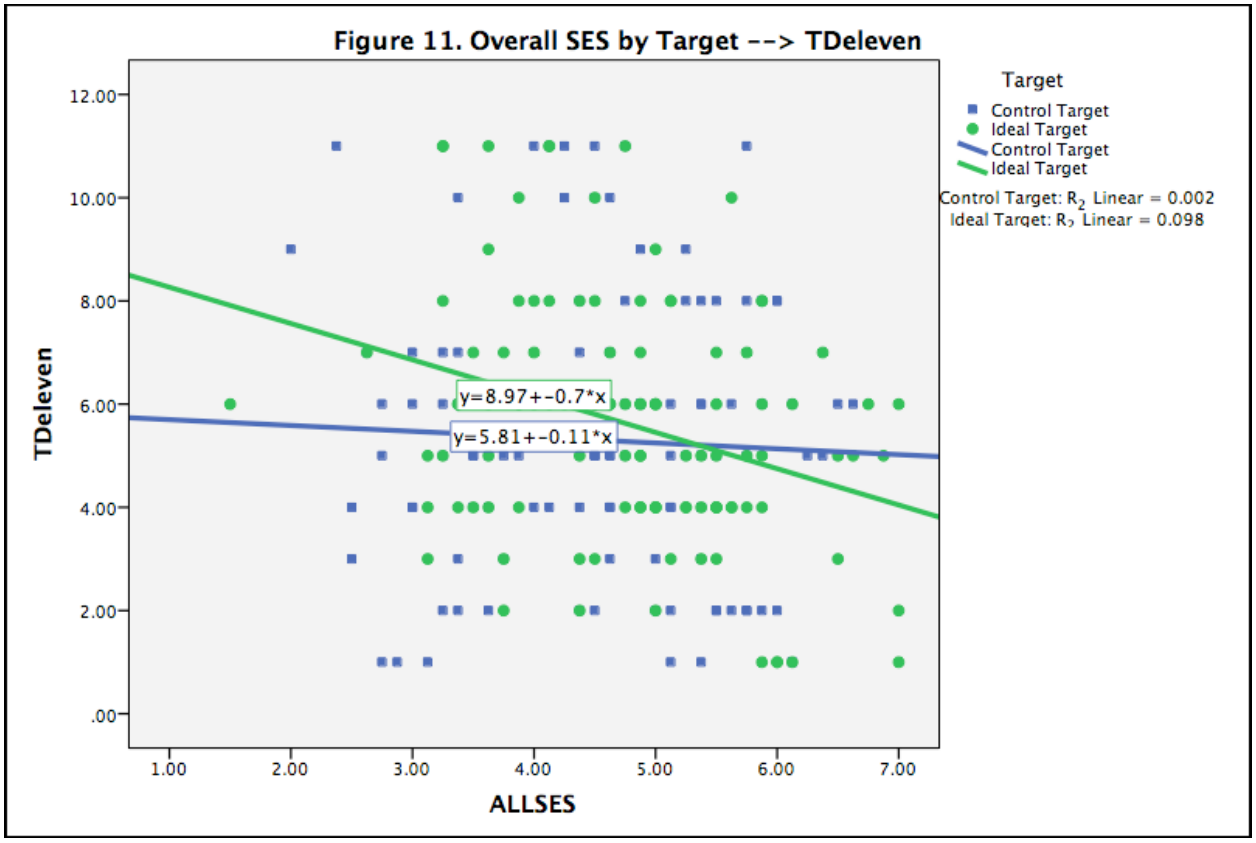

Figure 11. Overall SES Moderates Effect of Target on Time Preference

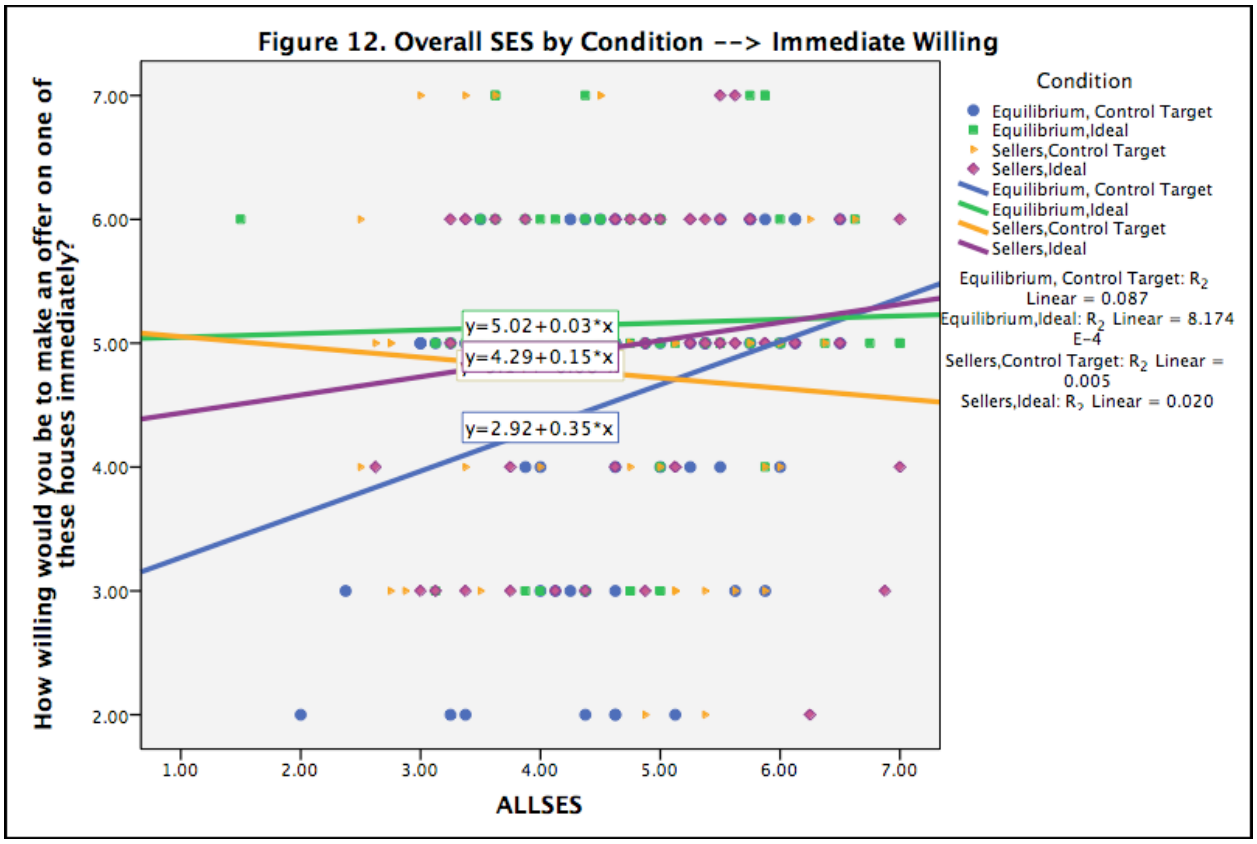

Figure 12. Three-way Interaction Among Overall SES, Market, and Target to Influence Willingness to Choose Immediately

Appendix IV:

HUMAN SUBJECTS APPROVAL

ASU Knowledge Enterprise Development

EXEMPTION GRANTED

Sau Kwan
Psychology
-
Virginia.Kwan@asu.edu

Dear Sau Kwan:

On 4/24/2014 the ASU IRB reviewed the following protocol:

Type of Review:	Initial Study
Title:	Comparison Targets, Resource Stability, and Decision Making.
Investigator:	Sau Kwan
IRB ID:	STUDY00001014
Funding:	None
Grant Title:	None
Grant ID:	None
Documents Reviewed:	• Consent RMA.pdf, Category: Consent Form; • IRB RMA Masters.docx, Category: IRB Protocol; • Masters Measures 4.24.pdf, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • Diestelmeier Human Subjects Training 1, Category: Other (to reflect anything not captured above); • Diestelmeier Human Subjects Training 2, Category: Other (to reflect anything not captured above); • Recruiting RMA.pdf, Category: Recruitment Materials;

The IRB determined that the protocol is considered exempt pursuant to Federal Regulations 45CFR46 (2) Tests, surveys, interviews, or observation on 4/24/2014.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).