

**Self-Control, Expectations, and Patience:
Essays on Social Decision Making**

by

Sachin Banker

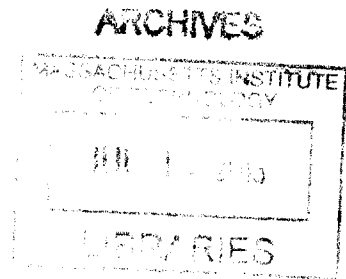
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Submitted to the Alfred P. Sloan School of Management
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ABSTRACT

Essay 1: Self-Control and Altruism: The Moderating Role of Endowments

People exhibit a remarkable ability to cooperate with one another, to an extent that critically distinguishes human society from communities of other primate and animal species. Although altruism plays an essential role in sustaining cooperation among unrelated groups of individuals, little is known about the underlying psychological processes that drive altruistic behavior. While evidence supporting conflicting dual-process accounts has appeared in the literature, here we offer an anchoring and adjustment account that clarifies the mechanistic relationship between self-control and the tendency towards altruism or selfishness. We find that participants depleted of self-regulatory resources are highly biased by initial endowments and insufficiently adjust away from them when making transfer decisions. Thus, depending on the nature of the initial endowments, individuals may reveal either increased altruism or increased selfishness under self-regulatory depletion.

Essay 2: Relative to Them: How Better Brands Reduce Product Efficacy

Across many domains, positive beliefs often lead to self-fulfilling positive outcomes. Here however, we find the opposite to be true. In a series of four studies, we observe that positive beliefs about products can lead to negative performance outcomes in using them when social comparison processes are activated. Although people appear to believe that high status branded products are of superior quality and are willing to pay more for them, these beliefs in fact lead people to evaluate their own expected performance relative to a higher standard of reference. Our findings suggest that when people contrast themselves to these higher reference points, they form negative expectations about their own performance that result in increased levels of intimidation and in turn, reduced product efficacy.

Essay 3: Altruistic Patience: When Giving More Beats Giving Now

People are known to take into account the welfare of others when making decisions. Many of these settings also involve tradeoffs in the benefits that others receive at different points in time. For example, donors make decisions between giving to those in immediate need and funding longer-term projects, policy makers impact their constituents by responding to immediate concerns and also supporting larger efforts for reform, and even friends face the perennial gift-giving problem in picking either short-lived novelties or necessities that will last. This work identifies a bias in the intertemporal choices that people make when the consequences of those choices are not directly experienced by the decision maker. In particular, I find that people appear to be more patient when conferring benefits to others rather than themselves and that this bias is driven by both relaxed time sensitivity and by diagnostic motivations.

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ESSAY 1

Self-Control and Altruism: The Moderating Role of Endowments

Abstract

People exhibit a remarkable ability to cooperate with one another, to an extent that critically distinguishes human society from communities of other primate and animal species. Although altruism plays an essential role in sustaining cooperation among unrelated groups of individuals, little is known about the underlying psychological processes that drive altruistic behavior. While evidence supporting conflicting dual-process accounts has appeared in the literature, here we offer an anchoring and adjustment account that clarifies the mechanistic relationship between self-control and the tendency towards altruism or selfishness. We find that participants depleted of self-regulatory resources are highly biased by initial endowments and insufficiently adjust away from them when making transfer decisions. Thus, depending on the nature of the initial endowments, individuals may reveal either increased altruism or increased selfishness under self-regulatory depletion.

People exhibit a remarkable ability to cooperate with one another, to an extent that critically distinguishes human society from communities of other primate and animal species. Sustaining cooperation requires people to be willing to take the altruistic initiative to give up their own resources to benefit others and to be able to suppress the selfish desire to engage in profitable deviations. When just a few selfish individuals are present in a group, cooperation can quickly deteriorate to make all individuals worse-off (Fehr and Gächter 2000). Though understanding what drives prosocial behavior is important for building cooperation, much still remains unknown about the underlying psychological mechanisms that fuel it. Since impaired self-regulation has been linked to both increases and decreases in prosocial behavior, in this paper we investigate exactly how self-control impacts altruistic behavior in an economic decision making context. We provide evidence that suggests an anchoring and adjustment mechanism plays an important role in determining how self-regulatory depletion influences observed levels of altruism.

How might self-regulatory depletion lead people to be both less willing to help others (DeWall, Baumeister, Gailliot, and Maner 2008) and also more likely to respond favorably to charitable requests (Fennis, Janssen, and Vohs 2009)? Here we offer an account postulating that behavior exhibited under self-regulatory resource depletion is more strongly biased by arbitrary anchors. We posit that in the context of prosocial behavior, individuals anchor on initial default values from which they then adjust in order to determine their response. The account we provide is predicated on two basic premises. First, ego-depletion is known to interfere with active processes that involve the substitution of an impulsive response with a goal-relevant response (Baumeister, Vohs,

and Tice 2007). Since the use of self-control draws on a common and limited pool of self-regulatory resources, any resource-dependent process can be suppressed by depletion in a prior unrelated task. Second, the adjustment process can involve effortful deliberation to revise estimates towards an accurate assessment (Epley and Gilovich 2005). Upon presentation with an arbitrary anchor, engaging in the deliberative process of recalling information that may serve to adjust estimates will therefore be susceptible to depletion. Based on these propositions, we hypothesize that depletion will interfere with the effortful adjustment process and will therefore lead to behavior more closely in line with arbitrary initial endowments.

In the context of altruistic decision making, our account suggests that people will behave selfishly when depleted if anchoring on an initial endowment that favors the self but will actually behave more altruistically when depleted if the initial state instead favors another person. We suggest that decisions will stick closer to initial endowments when participants are depleted and provide a proximal account of the mechanisms that generate wide biases in the elicitation of preferences for altruism and selfishness.

THEORETICAL BACKGROUND

Self-Regulatory Resource Depletion

A wealth of evidence has provided support for a limited-resource model of self-control that allows people to operationalize the effective pursuit of their goals. The limited-resource model posits that all processes involving the substitution of an impulsive

response draw on a common and limited self-regulatory resource (Baumeister, Vohs, and Tice 2007). As an implication, the model predicts that undergoing a prior resource-depleting task will result in temporarily reduced resource availability in subsequent tasks. Thus, using self-control in one task can impair self-control in another unrelated task. Since a wide range of different tasks can involve overcoming a prepotent response, a dual-task paradigm in which individuals first complete a depleting self-control task prior to completing the ostensibly unrelated task of interest is used as a standard method to uncover the role that self-control plays in the target task.

Indeed, self-regulatory resource depletion has been shown to influence behavior in a variety of different domains. For example, subjects that were asked to resist thinking about a white bear in a thought suppression task subsequently spent more money on unplanned purchases (Vohs and Faber 2007). In another study, subjects that first resisted a strong temptation to indulge in tasty candies subsequently exhibited lower persistence on an unsolvable geometric puzzle task (Vohs and Heatherton 2000). Other studies have also documented effects of ego-depletion in self-presentation, in favoring passive responses, and in being susceptible to social-influence techniques (Vohs, Baumeister, and Ciarocco 2005; Baumeister et al. 1998; Janssen et al. 2008), and recently localization of the neural basis of ego-depletion effects has identified the right dorsolateral prefrontal cortex (Hedgcock, Vohs, and Rao 2012), a region of the brain implicated in a variety of different conflict resolution tasks.

Anchoring and Adjustment

Anchoring biases have been examined since as far back as the well-known Tversky and Kahneman (1974) studies that involved participants estimating the percentage of African countries in the United Nations. The bias arises when an arbitrary number is used as a starting point when forming estimates and is characterized by the tendency to make estimates that are close to these arbitrary initial values. In the classic Tversky and Kahneman studies for example, the percentage of African countries in the UN was in this case biased by the outcome of a spin of the wheel of fortune, and people in fact responded with answers that were much closer to this value than would be expected by chance.

Anchor values have been shown to generate an anchor-bias by a pair of independent mechanisms: selective accessibility and effortful adjustment. We hypothesize that both pathways may be susceptible to interference by ego-depletion. First, an extensive line of work has demonstrated that anchoring effects can be generated by the increased accessibility of anchor-consistent information (Mussweiler and Strack 1999, 2000, 2001). The presence of the anchor leads people to evaluate the hypothesis that the anchor estimate is accurate, to then seek anchor-consistent information, and thus generate estimates that are more highly biased towards the anchor value. In this case the failure to engage in the active process of seeking anchor-inconsistent information would be more likely when self-regulatory resources are depleted, and would thus result in estimates that are biased closer to the anchor value.

Another line of work has shown that people exhibit anchor-biases because of the fact that the adjustment process is effortful (Epley and Gilovich 2006; Simmons, LeBouef, and Nelson 2010). When individuals deliberately make use of the anchor as a starting point, determining the amount to adjust estimates away from the starting value is effortful (Epley and Gilovich 2001, 2005; Epley 2004). Thus, ego-depleted individuals are expected to have difficulty engaging in this effortful adjustment process and to make estimates that are more highly biased by initial arbitrary anchors. Each of these processes are subject to the effects of ego-depletion and we remain agnostic as to which may be more heavily impacted when self-regulatory resources are diminished.

OVERVIEW OF THE EXPERIMENTS

We present evidence from five studies that examine the effects of self-regulatory depletion on altruistic behavior. Studies 1 through 4 each follow a dual-task paradigm in which participants complete a prior task unrelated to the target task in order to manipulate self-regulatory resource availability. In each experiment, participants were randomly assigned to either complete a depleting preceding task or a comparable but non-depleting task. In studies 1 through 3, we investigate the effects of depletion on the tendency to behave in an altruistic or selfish manner when financial rewards are at stake. Altruistic behavior is observed within the dictator game, a standard experimental economic tool that allows us to measure the extent of deviation from the rational, self-interested equilibrium prediction. Study 1 employs a standard dictator game while Studies 2 and 3

apply variations that swap initial endowments. In Studies 4 and 5, we focus on elucidating the proposed anchoring mechanism that contributes to the effects we observe.

STUDY 1

We first turn our attention to the dictator game to explore how ego-depletion may influence behavior in an economic decision making context. We make use of the dictator game in order to analyze decisions that have real financial consequences for the players involved and to also isolate the behavior of interest in the simplest possible way.

Method

Participants. A group of 82 subjects (33 women, 49 men; average age = 31, SD = 9.2) from a national sample completed the study online in exchange for a small monetary reward. Participants were entered into a lottery with a chance to win an additional \$10 bonus where the probability of winning was determined by their choices.

Procedure. Subjects participated in two ostensibly unrelated tasks: a vicarious depletion task and a standard dictator game. Participants first completed the vicarious depletion task, which involved participants reading a scenario while taking the perspective of the narrator. Participants were asked to take the perspective of a waiter (the narrator) and to then read and answer questions about the waiter's experience in a restaurant. Subjects were randomly assigned to read one of two stories. In the *depletion*

condition, the story describes a waiter that arrives to work hungry and has to resist the impulse to eat some of the tasty food served at the restaurant. In the *no depletion* condition, the waiter arrives full and does not have to resist an impulse to eat the anyway bad-tasting food served at the restaurant. This manipulation has successfully been used in past research and has shown that reading about instances of others overcoming impulses can vicariously deplete the self-regulatory resources of the observer (Ackerman, Goldstein, Shapiro, and Bargh 2009; Egan, Hirt, and Karpen 2012). Based on the previous findings that suggest this vicarious depletion manipulation is not effective on dieters, participants that strongly self-identified as being a dieter were not included in the analysis.

Following the depletion task, subjects played the role of a proposer in a dictator game. Given an endowment of \$10, subjects were asked to select an integer amount between \$0 and \$10 that would be given to an anonymous other participant. Instructions read “You now have \$10. You have been matched with another participant and have the option to give any portion of the endowment to this participant. The decision you make will be final. How much, between \$0 and \$10, would you like to transfer to the other participant?” Participants were informed truthfully that each dollar that was earned in the study would serve as an additional ticket in the bonus lottery. Finally, mood states were reported on the Brief Mood Introspection Scale (BMIS, Mayer and Gaschke 1988).

Results

We predicted that participants in the depletion condition would offer less money in the dictator game than participants in the no depletion condition. We find that participants in the depletion condition indeed indicated they would give on average \$3.09 in the dictator game versus non-depleted subjects that reported on average \$3.92 ($t(80) = 2.08, p = .04$). See Figure 1.

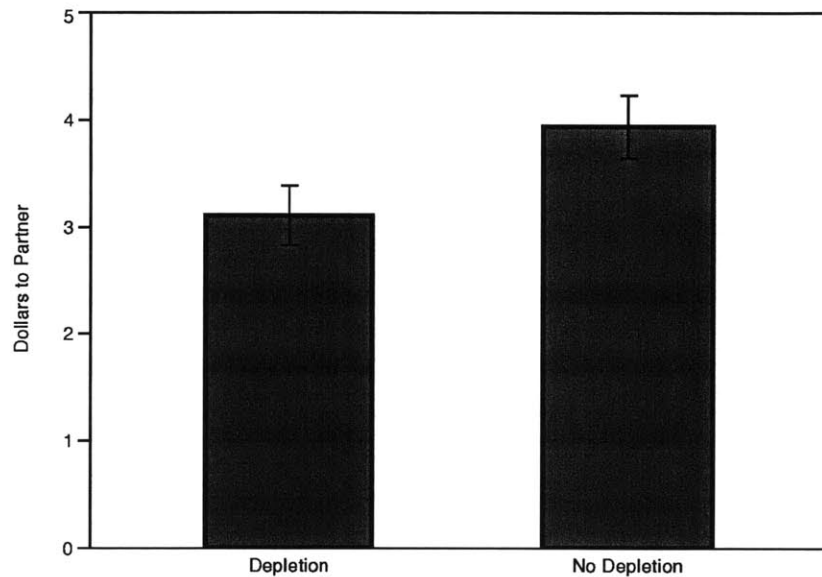


Figure 1. Participants that were depleted of self-regulatory resources sent less of the endowment to their partner.

We also tested whether modal responses change significantly under self-regulatory depletion. Responses indicate that depleted participants were also less likely than non-depleted subjects to transfer the equal \$5 split to recipients. Depleted

participants make this offer 24% of the time as compared to 41% of non-depleted subjects ($\chi^2 = 3.93, p < .05$). No mood related effects were observed on the BMIS (all p 's $> .30$).¹

STUDY 2

In order to test our hypothesis that anchoring on the endowment of the other player moderates the effect of self-control on altruistic decision making, we explore the effects of ego-depletion in a variation of the dictator game that swaps initial endowments. The equilibrium prediction that self-interested players will end up with the full endowment remains the same. However, participants in this game are initially allocated zero while other players are assigned the full endowment. By anchoring on the high endowment towards others, our account suggests that depleted subjects will in this setting exhibit transfers that appear to be more altruistic in their allocation of resources.

Method

Participants. A sample of 54 subjects (28 women, 25 men, 1 unreported; average age = 34 years, SD = 14) were brought into the lab for a fixed show up fee and were given the chance to earn additional money (up to \$10) based on their choices.

¹ Similar findings were also observed in an additional study that applied Stroop and “crossing out the e’s” depletion tasks. This additional study was run by a collaborating group and is not reported in detail here.

Procedure. Using a standard dual-task paradigm, participants undertook two ostensibly unrelated tasks: a typing depletion task and a modified dictator game. To manipulate self-regulatory resource availability, participants first completed a verbal flexibility task. All participants were asked to write continuously in response to three different prompts about daily events. The prompts consisted of basic questions, such as “Describe what you do on a typical weekday. Begin with the moment you wake up and end with the moment you go to sleep”. Those that were assigned to the *depletion* condition were asked to answer the prompts without using the letters ‘A’ or ‘N’ while those in the *no depletion* condition answered the prompts without using the letters ‘X’ or ‘Z’. Excluding the letters ‘A’ and ‘N’ from writing requires more self-regulation than excluding the letters ‘X’ and ‘Z’ due to the relative frequency of those letters in the English language. This manipulation has been used successfully in past research to deplete self-regulatory resources (e.g., Mead, Baumeister, Gino, Schweitzer, & Ariely, 2009; Pocheptsova, Amir, Dhar, & Baumeister, 2009; Schmeichel, 2007).

Following the verbal flexibility task, subjects played a version of the dictator game where initial endowments were swapped. In this version of the game, each participant was anonymously matched with another subject to play a one shot game involving the allocation of an endowment between the two players. Participants were instructed truthfully that an initial endowment of \$5 was allocated to anonymous other player that they were matched with, and they were then asked to report how much of the endowment they would like to take for themselves, in increments of \$0.25. Instructions read “the experimenter currently has \$5.00 in cash set aside for another participant, with whom you are matched. You do not have any money set aside. You will play today's

game by deciding whether you wish to take any of this \$5 for yourself and if so, how much (in increments of \$0.25). You can decide not to take any money.” All choices were implemented and all participants were paid accordingly at the end of the experiment. Mood measures were also reported on the BMIS.

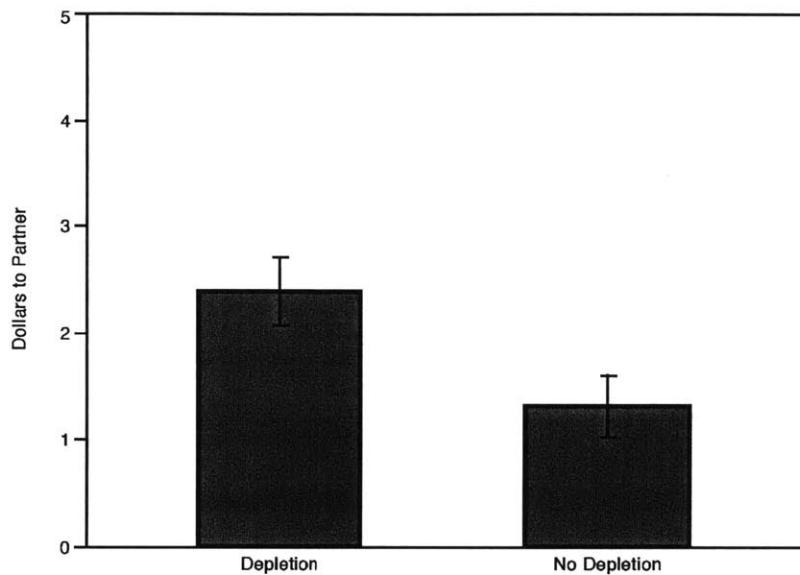


Figure 2. Amounts left for the other player in the dictator game when initial endowments are swapped.

Results

We find that depleted subjects leave more of the endowment other players compared to non-depleted subjects. As shown in Figure 2, depleted participants leave more money for other players when initial allocations are swapped in the dictator game. Compared to non-depleted participants, depleted participants allocate on average \$2.39 versus \$1.32 to partners ($t(52) = 2.42, p = .02$). Thus we observe that individuals can

appear to behave in either a more altruistic or less altruistic manner when depleted, depending on the initial endowment on which they anchor.

Additionally, we tested whether the number of people who transferred \$0 differed by condition. Our account suggests that a higher proportion of participants in the depletion condition would make no adjustment to the initial endowment and thus make a zero transfer. We find that depleted subjects are marginally more likely to make no transfer than are non-depleted subjects ($\chi^2 = 3.32, p < .07$).

Changes in mood do not explain the effects observed, as *t*-tests comparing responses on the BMIS were not significant (all *p*'s > .20). In addition, to check that the experimental manipulation was effective, subjects reported on a 7-point Likert scale the extent to which override, control, and effort was required to respond to the prompts in the verbal flexibility task. Subjects in the depletion condition reported that the task was more demanding on each of these dimensions relative to subjects in the non-depletion condition (all *p*'s < .01).

STUDY 3

Although the tasks were ostensibly unrelated and no difference in mood were observed, participants may have been influenced by their performance on the first task when making decisions in the following task. In Study 2, participants in the depletion condition could have felt they performed worse on the typing task, leading them to believe they deserve less of the endowment and thus leave more for the other player. In

the following study we address this concern by again using a vicarious depletion manipulation where success in the preceding task does not vary between conditions.

Method

Participants. A group of 89 subjects (41 women, 48 men; average age = 34; SD = 11) from a national sample completed the study online in exchange for a small monetary reward. All participants were entered into a lottery to win an additional \$10, with a probability of winning based on their choices.

Procedure. Subjects participated in two ostensibly unrelated tasks: a vicarious depletion task and a modified dictator game. First, participants completed the vicarious depletion manipulation. Again, participants were asked to take the perspective of the narrator while reading a story about a waiter at a restaurant. In the *depletion* condition the waiter had to resist impulses to snack on food served at the restaurant while in the *no depletion* condition the waiter did not have to resist any snacking impulses. Participants that strongly self-identified as being dieters were not included in the analysis.

In the following task, subjects made a decision in a variation of the dictator game where initial endowments were swapped. Participants were matched with another player that held 10 tickets to win the lottery while no tickets were allocated for the subject. Instructions read “We have currently set aside 10 tickets for another participant, with whom you are matched. You do not have any tickets set aside. You will play today’s game by deciding whether you wish to take any of the 10 tickets for yourself.”

Participants were asked to select how many tickets they would like to take for themselves. Mood measures on the BMIS and basic demographic variables were also obtained.

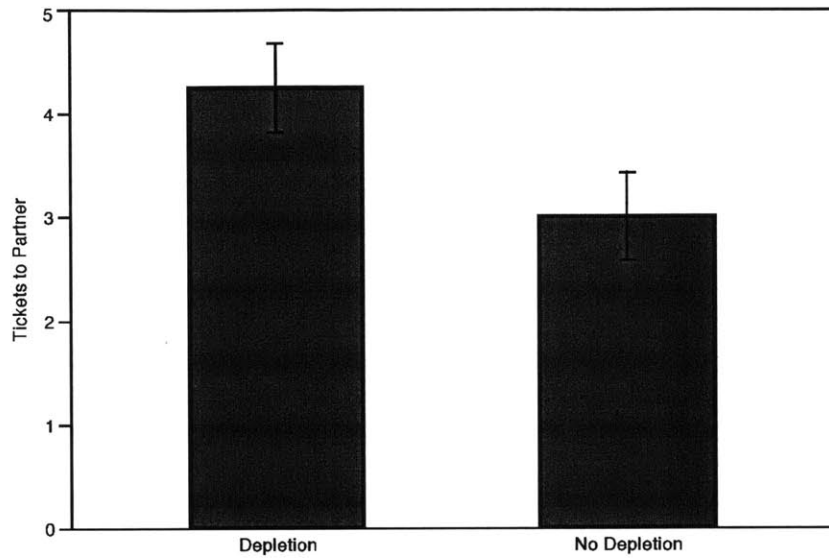


Figure 3. Amounts left for the other player in the dictator game when initial endowments are swapped

Results

We find that depleted subjects again leave more of the endowment for other players, compared to non-depleted subjects. As shown in Figure 3, depleted participants deliver more of the endowment to other players when the initial allocation is swapped in the dictator game. Those in the depletion condition deliver to others on average 4.24 tickets versus 3.00 in the non-depletion condition ($t(87) = 2.06, p = .04$).

Changes in mood do not explain the effects observed. Moods on the BMIS were not significantly different between conditions (p 's > .30). In addition, to check that the experimental manipulation was effective, subjects reported on a 7-point scale the extent to which control and effort was required in the situations each waiter faced. Subjects in the depletion condition reported that the task of the waiter was more demanding on each of these dimensions (p 's < .01).

STUDY 4

We next explore the processes that are impacted by self-regulatory depletion in order to better understand why it is that people tend to stick closer to initial endowments when making altruistic transfer decisions under depletion. We propose that self-regulatory resource depletion affects mechanisms involved in forming judgments when anchor values are present. In particular, we posit that depletion exacerbates the processes that lead to anchor-biases. Depletion may impact these processes either by increasing selective accessibility effects or by interfering with effortful adjustment. In the following study we remain agnostic as to which process plays a more important role and test directly whether depletion leads to more biased estimates.

Method

Participants. A group of 85 subjects were recruited from a national online sample in exchange for a small monetary reward. The sample included 65 women and 20 men, with an average age of 33 years (SD = 13).

Procedure. Subjects completed two ostensibly unrelated tasks in a standard dual-task paradigm: a typing depletion task and an estimation task. To manipulate self-regulatory resource availability, subjects first performed the verbal flexibility task, identical to as in Study 2. Participants were asked to write continuously in response to three different prompts about daily events. Subjects in the *depletion* condition were asked to answer the prompts without using the letters ‘A’ or ‘N’ while those in the *no depletion* condition answered the prompts without using the letters ‘X’ or ‘Z’. Excluding the letters ‘A’ and ‘N’ from writing requires more self-regulation than excluding the letters ‘X’ and ‘Z’ due to the relative frequency of those letters in common words.

Immediately following the verbal flexibility task, all subjects completed a price estimation task within an anchoring paradigm (Ariely, Loewenstein, and Prelec 2003). Subjects saw four different products on which they were to make estimates of the price. For each product, subjects made estimates in two stages. Upon viewing the product and a description, individuals were first asked whether the product was more or less than an anchor value. Subsequently, participants were asked to make an exact price estimate. An independent sample of subjects was used to pretest the range of responses following Jacowitz and Kahneman (1995), and anchor values were randomly assigned to be either

the 90th percentile or 10th percentile response in order to control for directional adjustment effects. Following the product price estimation task, participants completed the BMIS.

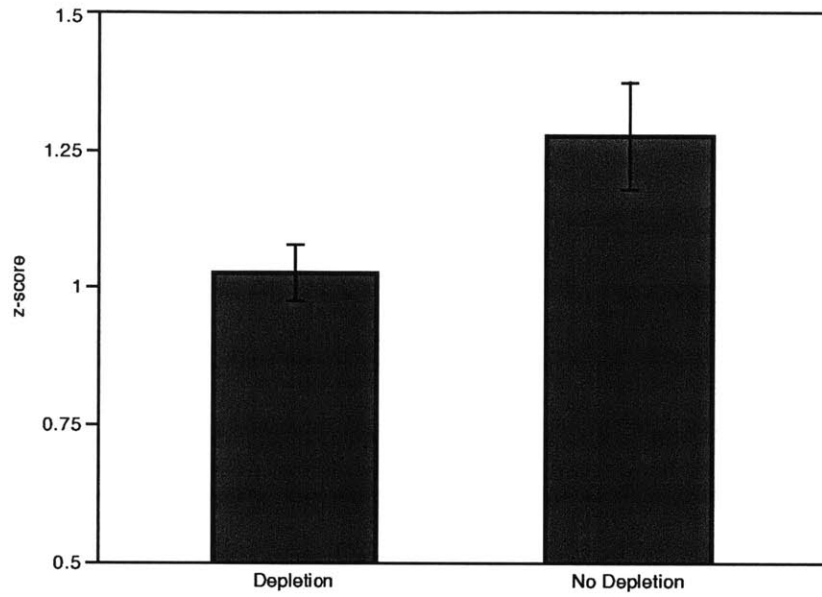


Figure 4. Average z-score of price estimates by depletion. Lower numbers indicate estimates closer to anchor values.

Results

We predicted that depletion would have the effect of attenuating adjustment away from anchor values when making price estimates. To test this hypothesis, we first standardized participants' responses to each of the price estimates by transforming them into z-scores. For each question, the z-score was determined by absolute value of the number of standard deviations away from the anchor value. Thus, a price estimate with a high z-score indicated significant adjustment away from the anchor value, while an estimate with a low z-score corresponded to little adjustment from the anchor. These

standardized responses were finally averaged into a single composite measure for each participant.

A comparison of the price estimates given by depleted subjects versus non-depleted subjects confirmed our predictions. As can be seen in Figure 4, participants that were depleted made estimates that were significantly closer to the anchor value than did non-depleted participants. Estimates made by participants in the depletion condition were closer to the initial anchor compared to the estimates made by participants in the no depletion condition (1.02 vs. 1.27, $t(83) = 2.11$, $p < .04$), suggesting that depletion exacerbates anchor-bias.

No mood related effects were observed on the BMIS (p 's range from .12 to .90). A manipulation check asking subjects to report the extent to which they required override, control, and effort to respond to the writing prompts also revealed that the depletion condition was indeed more taxing on self-regulatory resources (all p 's < .01).

STUDY 5

In the following study we aimed to test whether people do indeed anchor on initial allocations of resources, and whether these initial values serve to bias the fairness judgments that drive allocation choices in dictator games. To test the hypothesis, we varied endowments and measured both fairness judgments and behavior in versions of the dictator game.

Method

Participants. A group of 81 subjects (31 women, 51 men; average age 32; SD = 11) from a national sample completed the study online in exchange for a small monetary reward. All participants were entered into a lottery to win an additional \$10, with a probability of winning based on their choices.

Procedure. Participants were instructed that they would be making a decision to allocate ten lottery tickets between themselves and another anonymous participant. Subjects were assigned to one of two conditions that varied initial endowments. In the *send* condition, ten tickets were set aside for the subject and no tickets were set aside for the other player. In the *take* condition, ten tickets were set aside for the other player and no tickets were set aside for the subject.

After receiving information about initial endowments, subjects were then asked to report what they considered a fair allocation of tickets would be. Money burning was not an option, and all participants were required to report distributions that added up to ten tickets total. Finally, subjects then determined the actual distribution of tickets that would be delivered to each player. Those in *send* condition were asked to indicate the number of tickets they would like to transfer to the other player while those in the *take* condition were asked to indicate the number of tickets they would like to transfer to themselves.

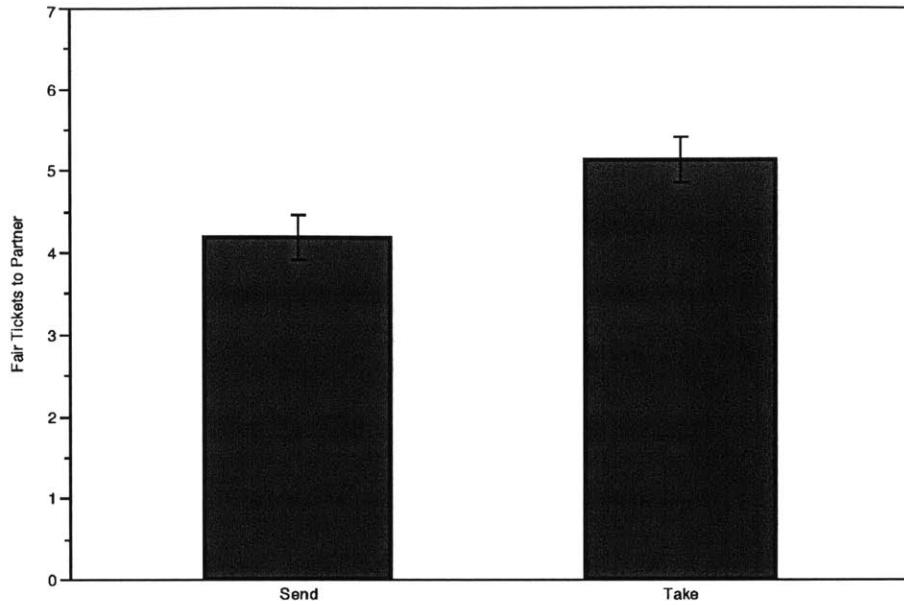


Figure 5. Fairness judgments are biased by initial endowments.

Results

First we observe that participants in the *take* condition deliver significantly more tickets to other players than those in the *send* condition, in line with the idea that people first anchor on the initial endowments and then adjust away before making decisions (4.52 vs. 3.15, $t(53) = 2.37, p = .02$).

We also find that when initial endowments favor the other player, the distributions that subjects find to be fair also tend to favor the other player. In particular, in the *take* condition in which the other player has ten tickets set aside, subjects report fair distributions that give significantly more to the other player than in the *send*

condition where the other player has no tickets set aside (5.13 vs. 4.18, $t(64) = 2.47$, $p = .02$).

Furthermore, a mediation analysis (Baron and Kenny 1986) revealed that the effect of the initial endowment on behavior in the dictator game was in fact mediated by fairness judgments. An initial allocation that benefits the subject predicts selfish behavior in the dictator game ($b = -.68$, $se = .29$, $t(53) = 2.37$, $p = .02$), and lower judgments of the fair number tickets to give to the other player also predicts selfish behavior in the dictator game ($b = .90$, $se = .17$, $t(53) = 5.38$, $p < .01$). In addition, initial allocations that are favorable to the participant predict lower fairness judgments of the amount that should be given to the other matched player ($b = -.53$, $se = .19$, $t(53) = 2.89$, $p < .01$). In the full model regressing dictator game behavior on both fairness judgment and endowment condition, fairness judgment remained significant ($b = .84$, $se = .18$, $t(53) = 4.67$, $p < .01$) while the effect of the initial endowment was reduced to non-significance ($b = -.23$, $se = .26$, $t(53) = .88$, $p = .38$). A Sobel test revealed that the decrease was significant ($z = 2.47$, $p = .01$). These findings suggest that participants rely on initial allocations to determine the fair amounts to give and behave accordingly when making allocation decisions in the dictator game. Since depletion exacerbates anchor-bias, as we observed in Study 4, depleted participants will be more heavily biased by initial allocations when generating fairness judgments and making decisions in dictator games.

GENERAL DISCUSSION

We proposed here that self-regulatory resource availability is an important determinant of observed altruistic behavior in that it influences the tendency to be biased towards anchor values when making decisions. In five studies we established that limiting resources exacerbates the tendency to rely on arbitrary initial anchors, leading people to behave more selfishly when initial states are favorable to the self and more altruistically when initial states are favorable to another.

In Study 1 we demonstrated that in standard dictator games people transfer less money to others when depleted of self-regulatory resources, and that this effect is not due differences in what one deserves. In Studies 2 and 3 we then found that when depleted, people instead transfer more to others when initial endowments favor the other player. We again ruled out the alternative that merit drove the observed effects. Taken together, these results suggest that any direct effects of depletion on selfish or altruistic behavior are second-order relative to the effects on the more fundamental processes involved in making these decisions. We proposed that self-regulatory resource depletion exacerbates the tendency to exhibit biases towards arbitrary information. In Study 4 we show that this manifests even within a basic judgment context, and in Study 5 we show that these initial endowments are in fact relied upon when making fairness judgments. Our findings contribute to broader streams of literature to which we make connections below.

Anchoring and Adjustment

A growing body of work has accumulated evidence consistent with our findings that depletion strengthens anchor-bias. Danziger, Levav, and Avaim-Pesso (2011) for example find that judges tend to make more favorable decisions immediately after lunch. By presumably replenishing self-regulatory resource availability with the break, these important decision makers cast sentences that diverge more significantly from the default sentence. Recent work has also shown that the features of the task can play an important role in how people may rely on default allocations when depleted of self-regulatory resources. Evans et al. (2011) show that depleted participants tend to make fewer clicks and thus tend to rely on starting investment allocations in a trust game. We provide evidence that complements these findings in offering direct process-related information.

Other work has shown that anchoring biases are reduced when there exists adequate motivation within the individual to provide an accurate estimate. When financial incentives are present anchors do not lead to strong biases, but they do when people receive interference from alcohol consumption and cognitive load (Epley and Gilovich 2005, 2006). Similarly, people become more accurate at making judgments when they are encouraged to make multiple guesses (Vul and Pashler 2008, Herzog and Hertwig 2009). These findings point to the fact that adequate motivation is required to immunize oneself against making biased judgments. Thus, our findings provide another mechanism by which motivation towards making accurate judgments may become impaired. Since self-regulatory resources play a central role in enabling people to progress from their current state to a desired goal, depleting resource availability can

diminish the motivation to achieve accuracy in judgments, thus leading to greater anchor-bias as we observed.

Altruism and Self-Regulation

While altruism is a fundamental feature of human social behavior and is an important force that both drives decisions and encourages cooperation, investigations of the relationship between altruism and self-control have thus far provided conflicting characterizations. Our findings provide an account that suggests that subtle variations in the task features may have first-order effects on behavior.

Of the conflicting viewpoints that exist in the literature, one line of evidence has produced the view that behavior in line with social and cultural fairness norms typically requires suppression of impulsive selfish desires. In particular, studies that have applied neuroscientific methods to disrupt regions of the brain highly integrated in cognitive control networks, the right dorsolateral prefrontal cortex in specific, have observed higher rates of self-interested behavior in ultimatum games (Knoch et al. 2006; Knoch et al. 2008; van't Wout, Kahn, Sanfey, and Aleman 2006; Baumgartner et al. 2011). This interpretation is consistent with the idea that self-control may be the underlying virtue that enables altruism, trustworthiness, fidelity, as well as other morally desirable traits (Baumeister and Exline 1999).

However, other evidence has pointed to the opposite view, that altruism is an automatic behavior which must be substituted with self-interested actions in order to respond in a strategic manner. For example, the tendency to take into consideration the

well being of others when making decisions in the ultimatum game can be predicted activity in regions of the brain involved in automatic processing of affective stimuli (Sanfey et al. 2003; Tabibnia, Satpute, and Lieberman 2008) and observing equitable outcomes and retribution can be hedonically desirable in themselves even when they come at a material cost (Tricomi, Rangel, Camerer, and O'Doherty 2010; de Quervain et al. 2004). This interpretation of altruism as an automatic behavior has been offered as a solution to the evolutionary problem of explaining how fitness-reducing altruistic behavior may still persist in the population over time (Tomasello 2012).

The findings that self-regulatory depletion both decreases and promotes prosocial behavior in different circumstances suggests that existing accounts of the relationship between self-regulation and prosocial behavior are incomplete. Our findings suggest an alternative account of the relationship between self-regulation and prosocial behavior based on an anchoring and adjustment mechanism. We showed that the relationship between self-control and altruism in the dictator game depended on the initial default state. Conditional on the anchor on which individuals base their choice, people may exhibit either more altruistic or less altruistic behavior when depleted of self-regulatory resources.

Limitations and Future Research

Some limitations apply when making generalization of the findings reported here. First, in our studies depletion manipulations were administered directly prior to making allocation and estimation choices. This evidence in itself does not allow us to predict the

length of the window in which altruistic decisions will be impacted by self-regulatory depletion, though we do observe robust effects when decisions are made in quick succession to the manipulation. Our studies here also focus on a particular measure of altruism: transfer amounts in dictator games. This commonly used measure is representative of many real world situations, however interesting extensions of this work might explore other contexts of prosocial behavior where the relevant anchors that could bias decisions differ.

Future work may also further elucidate the mechanisms involved in making altruistic decisions. Here we observed that anchor-biases increase in stickiness after self-regulatory resource depletion. These effects may occur through both judgment and decision processes that are influenced by self-regulatory resource availability. In specific, the failure to sufficiently adjust away from anchor values may result from both an inability to gather information and revise judgments as well as from a lower standard placed on the amount of information needed to make a decision. Both changes would lead to behavior more closely in line with initial anchors, but each may suggest unique policy prescriptions if considered independently. Furthermore, we identified a general tendency towards increased anchor-bias in our findings, but a more precise understanding of the processes that are impacted by ego-depletion may be valuable. Future work may distinguish the independent effects of depletion on selective accessibility and effortful adjustment mechanisms.

Here we showed that the tendency to exhibit anchor-bias is susceptible to the depletion of self-regulatory resources. We found evidence indicating that this process can lead to differential levels of altruism under depletion, based on the default responses on

which individuals anchor. Since the anchoring biases appear in many domains of behavior, we anticipate that similar effects may manifest in other contexts where default responses are salient. We hope that this work motivates further research exploring the extent of these effects and the interesting interaction between defaults and self-control that drive consumer behavior.

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ESSAY 2

Relative to Them: How Better Brands Reduce Product Efficacy

Abstract

Across many domains, positive beliefs often lead to self-fulfilling positive outcomes. Here however, we find the opposite to be true. In a series of four studies, we observe that positive beliefs about products can lead to negative performance outcomes in using them when social comparison processes are activated. Although people appear to believe that high status branded products are of superior quality and are willing to pay more for them, these beliefs in fact lead people to evaluate their own expected performance relative to a higher standard of reference. Our findings suggest that when people contrast themselves to these higher reference points, they form negative expectations about their own performance that result in increased levels of intimidation and in turn, reduced product efficacy.

People have powerful beliefs. Their expectations about experiences, products, and their own future well-being not only inform decisions but also have the self-fulfilling ability to determine actual outcomes. For example, individuals are known to seek hypothesis-consistent information to see what they want to see (Balcetis and Dunning 2006), to actually perform better when paying more for an energy drink implicitly believed to be of higher quality (Shiv, Carmon, and Ariely 2005a), and to truly experience less pain even when taking an inactive placebo medication (Wager et al. 2004). It may be plausible then that the higher quality expectations afforded by consuming a high-status brand product might also lead to self-fulfilling improvements in product efficacy. Here we in fact find evidence of the opposite, that in spite of being willing to pay more for them, high-status brand products can exhibit lower efficacy and can actually lead people to perform worse when using these products.

In many ways, improvements in product efficacy that are caused by changes in non-functional product features can be likened to medical placebo effects. When varying features of a product that are unrelated to its actual functioning (such as price, packaging, or brand), the real improvements in performance caused by the manipulation are comparable to the positive health improvements that pharmacologically inert placebo treatments are able to elicit (Borsook and Becerra 2005). Improving product functionality through simple non-functional changes is a tremendously consequential topic. Little is currently known about how marketing actions may generate real improvements in product efficacy however, and the present work provides a contribution in this direction. Underlying our approach is a theoretical framework that borrows terminology from the medical domain and accounts for how superficial changes in a

product may elicit real efficacy benefits to the consumer beyond only those in judgments and attitudes.

This essay focuses on identifying and accounting for a reverse placebo effect of high-status brand products, whereby the labeling of a product with a high-status brand actually reduces subsequent product-related performance. Our analysis extends the model in Shiv, Carmon, and Ariely (2005b) by deconstructing the process by which beliefs about performance are formed. Expectations are known to be malleable and can be influenced by the frame and reference point in mind when making a judgment (Tversky and Kahneman 1981). If reference points are set at high levels, prospects that are evaluated below the reference point are interpreted as negative outcomes. Thus, we suggest that while the consumption of high-status branded products elicits objectively high expectations on performance it also activates a reference group comparison against which an individual's own expected performance is evaluated, often to the user's detriment.

The paper is structured by first providing a conceptual overview of our approach. We discuss the existing literature on placebo effects in the marketing domain, the tendency of brand cues to elicit reference group comparisons, and the way in which self-monitoring biases attention towards status-related signals. We then proceed by presenting our experimental results and conclude with a brief discussion of future directions for research.

THEORETICAL BACKGROUND

Placebo Effects in the Marketing Domain

Previous work has established that marketing actions can in fact generate real effects on product efficacy beyond the subjective changes in judgments and beliefs. For example, Shiv, Carmon, and Ariely (2005a) show that when consuming a price discounted energy drink, participants solve fewer anagrams than those consuming a full priced drink. This effect has been shown to be moderated by the strength of motivation (Irmak, Block, and Fitzsimons 2005) and can also occur when manipulating other product features like the number of ingredients on the label (Wright et al. 2012).

The finding that price differences can elicit real changes in performance is accounted for within a belief-expectancy-outcome framework in which salient product related beliefs generate response expectancies that then lead to actual behavioral outcomes. For example, the placebo effect of price occurs by activating strong price-quality associations that lead to positive response expectancies, subsequently resulting in the subjective and behavioral outcomes, or placebo effects (Shiv, Carmon and Ariely 2005b). This framework has also been extended with compatible theories of belief formation. In particular, since work on motivated reasoning has established that people often tend to perceive information in a manner most beneficial to them, Mishra, Mishra, and Shiv (2011) reasoned that vague information, versus precise information, would lead to more positively biased beliefs that indeed lead to improved performance expectations and actual performance, as they show.

Our work extends the belief-expectancy-outcome framework in a novel way that makes predictions as to when reverse placebo effects may arise. Since a large body of work has demonstrated that brand signals can engender reference group comparisons (e.g. Escalas and Bettman 2005), we posit that high-status branded products will elicit comparisons to highly-performing reference others, thus leading to a negative evaluation of an individual's own relative performance. By generating negative beliefs about relative performance, detrimental response expectancies will be activated, subsequently presenting in the form of lower performance levels. We discuss in more detail below the ways in which brand signals cause reference group comparisons, and we also consider individual differences in the tendency to rely on brand information.

Brands, Reference Group Comparisons, and Self-Monitoring

Consumers are known to seek products and brands linked to high social status as associations with high-status products allow people to provide signals of identity to others and differentiation from the mainstream (Veblen 2006; Berger and Ward 2010). Similar to high-priced products, high-status products often generate positive expectations of quality and taste (Plassman, O'Doherty, Shiv, and Rangel 2008; Wansink, Payne, and North 2007).

Why then might a higher status product result in lower performance among users? A long line of research has established that individuals are prone to comparing themselves to others (Festinger 1954). Comparison processes can be activated by brand cues as well, bringing to mind reference groups considered to be representative of the

brand (Escalas and Bettman 2003, 2005; Bearden and Etzel 1982). When making comparisons in the absence of psychological closeness to the target, features of the target become more cognitively accessible than features of the self, resulting in contrast rather than assimilation effects of social comparison (Mussweiler 2001). Therefore we suggest that when faced with high-status brand cues, individuals consider dissimilar high-performance reference groups against which they make their comparisons when evaluating how they will perform on the task at hand. In effect, even if products are identical, a higher status association may lead to poorer performance based on implied standards and performance expectancies. When comparison targets are instead similar, we suggest that individuals will assimilate toward the standard and will evaluate their own expected performance as being relatively high when using this high-status product.

Individual differences can importantly impact the motivation to attend to and process brand-related information. A key trait that predicts this propensity is self-monitoring, or the predisposition towards using social cues as behavioral guidelines and exhibiting sensitivity to the presentation of oneself to others (Becherer and Richard 1978; Snyder 1974). With greater motivation to respond to social cues, self-monitors are more likely to process brand information (MacInnis, Moorman, and Jaworski 1991). Thus we suggest that the social comparison processes elicited by brand cues that generate negative response expectancies will be more strongly observed in those individuals that attend to brand cues, or high self-monitors.

OVERVIEW OF THE EXPERIMENTS

We propose that higher status brands elicit social comparison and that though perceived as more effective, consumption of these products will result in lower performance due to the higher standards that individuals contrast themselves against. We test the hypothesis that comparison against high-performance reference others impacts actual performance when using high-status brand products. The results of four studies presented here compare identical products that differ only in brand name status, and measure participant performance after using these products. Our studies center specifically on the impact of brand cues on cognitive performance: namely, problem solving (quantitative and verbal acuity) and learning (novel language retention).

STUDY 1

In our first study, we seek to directly test the effects of brand status on product efficacy. While higher status brands may be associated with higher perceptions of quality, in instances where they increase performance standards associated with dissimilar reference groups, they may cause reverse placebo effects by eliciting negative relative comparisons that lead to negative performance outcomes. Because people differentially attend to and rely on external standards to evaluate their own behavior, we also explored how the tendency towards self-monitoring influences the reverse placebo effect.

We developed a new paradigm to test the effectiveness of brain training programs on improving cognitive ability. Participants were asked to complete a brief training

program adapted from the popular Nintendo game, Brain Age. Advertised as a mental fitness program, the Brain Age software is inspired by the work of the neuroscientist Dr. Ryuta Kawashima (2008) and has claimed to help boost brain power with minutes of training a day. In our paradigm, participants receive training on a number identification task and subsequently complete a cognitive ability exam to measure the efficacy of the brain training program. While the content of the training program remained identical, we manipulated only the ostensible branding of the training program.

Method

Participants. A total of 265 participants (170 women, 95 men; average age = 34, SD = 13) from a national sample completed the study online in exchange for a small monetary reward. All participants were told that they would be testing a brain training program, and that previous research had established that spending more time on brain training exercises could improve cognitive ability and increase performance on everyday tasks.

Procedure. Each participant completed two tasks in the study, consisting first of the branded brain training exercise and then followed by a cognitive ability exam. While the content of the training programs was identical across conditions, subjects were randomly assigned into one of three brand conditions: (1) a high-status brand condition where subjects were told that the training was developed for Massachusetts Institute of Technology (MIT) students, (2) a low-status brand condition where subjects were told

that the training was developed for University of Phoenix (Phoenix) students, or (3) a control condition in which participants received no information about a target demographic. To strengthen the brand manipulation, the respective school logos were again displayed above and below the training exercise.

The training task involved an adaptation of the high number game from the popular cognitive fitness video game Brain Age in which on each training trial, participants were asked to pick the highest number on the screen while being distracted by the visual size of other numbers. In order to measure efficacy of the brain training program, subjects next completed a cognitive ability exam made up of eighteen challenging math, verbal, and emotion identification questions that were adapted from IQ tests and theory of mind tests (Baron-Cohen et al. 2001).

Finally, participants were asked to respond to a set of questions aimed to probe the tendency towards self-monitoring. These questions included such as “I think about my image in the eyes of others” on which participants indicated their level of agreement or disagreement on a 7-point Likert scale. In addition, as a manipulation check, participants within the two school conditions were asked to indicate their agreement with statements related to the standards associated with the schools (“It is difficult to be accepted into [name of school],” “[Name of school] is a prestigious institution,” and “[Name of school] students are more intelligent than the average person”).

Results

Manipulation check. First, the questions relating to school standards were collapsed into a single index (Cronbach's $\alpha = .92$). A manipulation check confirmed that standards at the University of Phoenix were indeed evaluated as lower than those at MIT ($t(205) = 5.75, p < .01$).

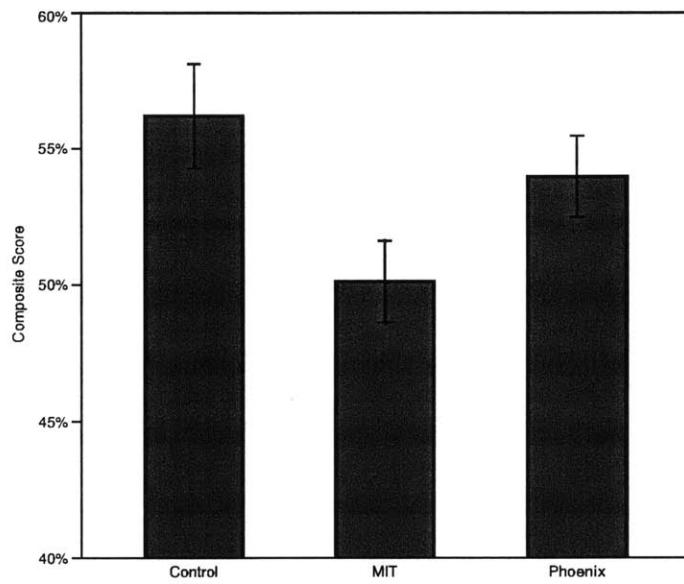


Figure 1. Performance on mental acuity tasks drops when completing an MIT-branded training program

Reverse placebo performance effects. Scores on the cognitive ability exam were combined into a composite score that weighed each portion of the exam equally. While MIT was evaluated to have higher standards than Phoenix, we find that performance decreased by a larger amount in the MIT condition than in the Phoenix condition, relative

to the no brand control. A oneway ANOVA analysis revealed a significant main effect of the brand ($F(2, 262) = 3.38, p < .04$). Comparing conditions directly, we see that rather than seeing performance increases in the Phoenix condition, we observe smaller performance decreases in the Phoenix compared to the MIT condition, relative to the control. Participants in the MIT condition performed significantly worse than those in the control condition (mean score = 50% vs. 56%, $t(160) = 2.44, p < .02$) while participants in the Phoenix condition did not perform significantly differently from the control condition (mean score = 53% vs. 56%, $t(159) = .91, p > .35$). The effect of school brand on performance is significant even after controlling for age and education levels ($F(2, 263) = 3.54, p = .03$).

Self-monitoring. Responses to self-monitoring items were combined into a single scale (Cronbach's $\alpha = .68$). Subjects were then classified as high self-monitors or low self-monitors based on a median split. Looking to baseline response accuracy levels in the control condition, we identified the most difficult questions on the cognitive ability exam and divided the exam into the most difficult and least difficult halves (results are robust to the choice of difficulty partitioning). We were thus able to observe how performance standards interfere with the ability to perform well in the treatment conditions. We find evidence of an interaction effect between brand and self-monitoring when answering the most difficult questions ($F(1,206) = 4.68, p < .04$) but no such interaction effect when answering the least difficult questions ($F(1,206) = .46, p > .49$). These findings suggest that self-monitoring and question difficulty jointly moderate the effect of performance standards on actual performance. When the questions are

objectively tough, and individuals are prone to comparing themselves against others, high-status brands are likely to elicit detrimental performance effects.

STUDY 2

Having established in our first study that high-status brands can actually reduce product efficacy, we aimed next to explore more thoroughly the mechanisms that underlie this finding. In order to test the robustness of our findings and assess the ability of brand cues to impact cognitive performance in completely new contexts, we developed a paradigm to assess the efficacy of new language learning tutorials. Participants were asked to complete a brief training program to learn a language that most participants were likely to be unfamiliar with: Na'vi, the 1500-word language developed for the 2009 film *Avatar*. Since subjects had no prior knowledge of the language, we were able to measure the efficacy of the language learning tutorial by testing participants on their understanding of the language after the training program. While the content and presentation of the training program again remained constant, the branding of the tutorial was manipulated to address our questions about the effects of brand status in the actual amount learned from the training software.

Method

Participants. A group of 137 participants (55 women, 80 men, 2 unreported; average age = 23, SD = 4.7) at a northeast university behavioral laboratory completed a

language learning task as part of a broader survey session on psychology and marketing, in exchange for a monetary reward. Participants learned Na'vi, a 1500-word language that was developed for the movie Avatar.

Procedure. While all participants received the same Na'vi learning materials, the ostensible authors of the material were manipulated by assigning subjects to one of two conditions: (1) a high-status brand condition where participants were told that the tutorial was produced by students at the Massachusetts Institute of Technology (MIT), or (2) a low-status brand condition where participants were told that the tutorial was produced by students at the University of Phoenix (Phoenix). To strengthen this manipulation, the logos of the respective school were featured prominently during the tutorials.

Participants completed the study in two parts consisting of a language training tutorial and a retention exam. First, subjects completed the language learning training program in which all participants viewed a 1-minute beginner video tutorial on the Na'vi language and were given an additional minute to review a vocabulary list from the tutorial. After participants reviewed these tutorial materials, they completed a test to evaluate how much was learned from the training tutorial. To assess participant learning from the program, all participants were given a 12-question Na'vi translation test, where participants were asked to determine the correct English translation for a Na'vi sentence. To ensure that we were measuring new language acquisition, we asked all participants about their familiarity with the Na'vi language prior to the survey.

In order to measure the effect of the brand manipulation, participants reported their perceptions of the performance standards associated with the tests by indicating

their agreement with the statement “the standards for this task were high” on a 7-point Likert scale. Subjects also indicated their agreement with the statement “I was intimidated by the task” on a 7-point scale in order to address the hypothesis that increased performance standards may increase intimidation. Participants indicated the number of years of education they had received, which was used as a covariate in our analyses. Finally, to assess whether participants differed in their perceptions of tutorial quality, we asked participants to indicate how well they thought the tutorial prepared them in Na’vi (1 = Very poorly, 7 = Very well), as well as their willingness-to-pay for a 100-minute series of tutorials similar to the ones provided.

Results

Beliefs about tutorial efficacy. Even though the tutorials were identical in terms of learning material, participants believed they were better prepared and willing-to-pay more for the tutorial in the MIT condition relative to the Phoenix condition. Comparing participants in the two different conditions, we find that those that received the MIT tutorial indicated that felt better prepared than those that received a University of Phoenix tutorial ($M = 3.53$ vs. 2.92 , $F(1,133) = 6.15$, $p = .05$). Participants were also willing to pay more for the tutorial in the MIT condition ($M = \$27.00$) than the Phoenix condition ($M = \$15.70$; $F(1,132) = 3.88$, $p = .05$). These results provide evidence that suggests participants actually believed the MIT tutorial was of superior quality to the Phoenix tutorial. Yet, would this translate into superior learning and performance outcomes for the MIT tutorial participants?

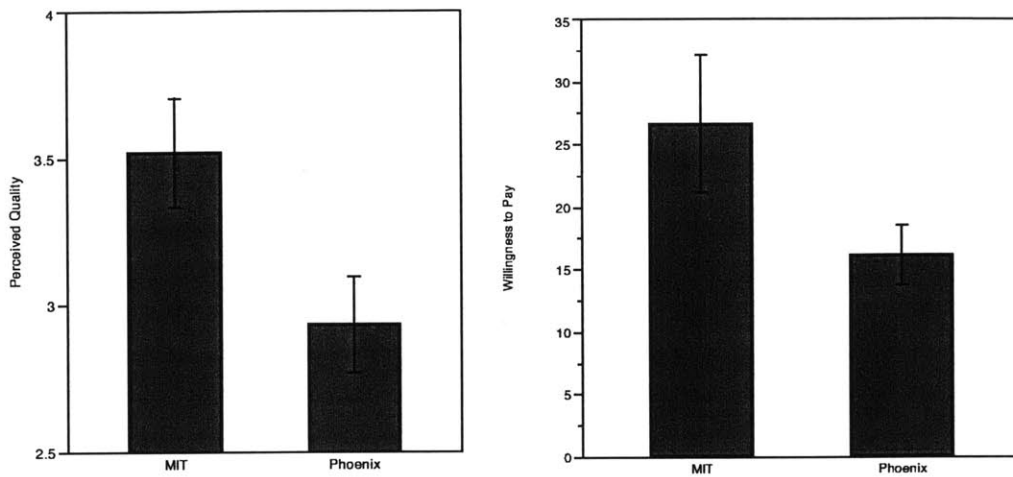


Figure 2. Higher-status brand tutorials were perceived to be of higher quality and elicited a higher willingness to pay

Reverse placebo performance effects. To assess the effect of a high status brand on language test performance, we summed each participant’s correct answers on the 12-question Na’vi language exam. While the MIT tutorial was perceived to be higher in quality than the University of Phoenix tutorial, we find that performance on the language exam was lower in the MIT condition relative to the University of Phoenix condition. A one-way ANCOVA analysis revealed a significant main effect of the school brand ($F(1, 133) = 4.37, p = .04$), even after controlling for the effects of age ($F(1, 133) = 14.01, p < .01$) and education ($F(1, 133) = 10.48, p = .01$) on performance. Consistent with our predictions, participants performed worse on the language test when the tutorial was framed as an MIT tutorial ($M = 10.10$) than as a University of Phoenix tutorial ($M = 10.90$).

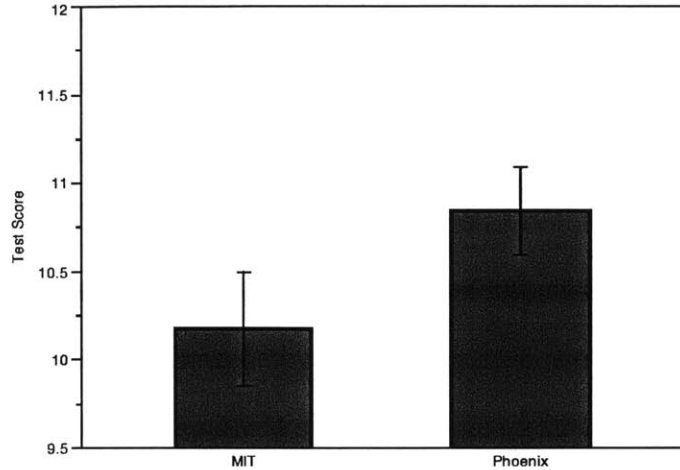


Figure 3. Participants that received the MIT-branded training tutorial performed worse on the language exam.

Mediation analysis. To explore the mechanisms that underlie the reverse placebo findings we observe, we conduct a three-path mediation analysis (Taylor, MacKinnon, and Tein 2008) to assess the role of perceived standards and self-reported intimidation levels on the relationship between brand status and performance. In particular, we suggest that participants that receive higher-status brand tutorials engage in social comparison that elicits contrast against highly performing reference others. This comparison against a high standard of reference subsequently causes people evaluate their own performance expectations in a more negative manner, resulting in increased levels of intimidation and thus lower exam performance.

Consistent with our predictions, perceived standards for the exam were significantly higher when participants were exposed to the MIT tutorial ($M = 4.04$), relative to exposure to the University of Phoenix tutorial ($M = 2.87$, $F(1, 132) = 20.66$, $p < .01$). Furthermore, when included in the model, these perceived standards significantly

predicted participant levels of intimidation ($F(1,125) = 10.59, p < .01$). Finally, when school brand, standards and intimidation are included in a model predicting test performance, intimidation predicts test performance ($F(1,124) = 16.17, p < .01$). At the same time, the effects of the school brand ($F(1,124) = .911, p = .34$) and standards ($F(1,124) = 1.745, p = .19$) on test performance fail to reach significance. This pattern of results supports a three-path mediation of the relationship between school brand and performance via the standards and intimidation cued by the high-status brand product. In other words, perceived high standards associated with the school mediated the relationship between the school and self-reported level of intimidation, which then mediated the relationship between perceived high standards and performance on the test. Table 1 summarizes the results of this analysis.

| IV | Standards (Mediator 1) | | Intimidated (Mediator 2) | | Performance (DV) | |
|-------------|---------------------------|-------|-----------------------------|-------|---------------------|-------|
| | β | t | β | t | β | t |
| Constant | 0.572 | 0.656 | 0.775 | 0.912 | 11.233 | 9.034 |
| Education | -0.103 | 1.576 | -0.003 | 0.053 | 0.325*** | 3.509 |
| Age | 0.119*** | 3.334 | 0.020 | 0.549 | -0.157** | 2.929 |
| School | 1.167*** | 4.545 | -0.024 | 0.090 | -0.366 | 0.954 |
| Standards | | | 0.277*** | 3.254 | -0.171 | 1.321 |
| Intimidated | | | | | -0.524*** | 4.021 |

*** $p < .01$ ** $p < .05$

Table 1. Study 2 mediation regression results. Brand status affects performance through perceived test standards and intimidation.

STUDY 3

In our next study, we address the relative impact of the effects of price and brand changes on performance. We augment our experimental design with price manipulations to test whether higher pricing may result performance benefits in spite of the inhibitory performance effects of high-status branding. Thus, this study includes two non-functional product manipulations that may serve to either increase performance (in the case of a high price) or decrease performance (in the case of a high-status brand).

Method

Participants. A total of 119 participants (51 women, 68 men; average age 35, $SD = 12$) from a national sample completed the language learning task online in exchange for a small monetary reward. Two participants indicated affiliation with the University of Phoenix, one participant indicated affiliation with MIT, and two participants indicated they knew Na'vi prior to this survey. To ensure that our analyses only included participants with no prior experience with the schools and languages in the training, we excluded these five participants.

Procedure. As in Study 2, participants completed a tutorial and test on the Na'vi language; once again, we told participants that the tutorial was produced by students at the Massachusetts Institute of Technology (MIT), or the University of Phoenix (Phoenix).

In addition to manipulating the brand associated with the training materials, we also provided participants with price information for the training program. Participants were told that the program would be offered for either \$34.95 per month (full-price condition) or for \$9.95 per month, discounted from the full price of \$34.95 per month (discounted price condition). To give participants a sense of the price distribution in the language learning software market, we also provided all participants with the typical costs of several major language programs that ranged in price from \$15 to \$20 per month. Thus in the full-price condition, participants inferred that this new training program would be offered at a price above alternative options in the market; conversely, participants in the discounted-price condition inferred the program would be offered at a price below alternative options in the market.

After the training tutorial, participants completed a 17-item, multiple-choice test on the Na'vi language similar to the one administered in Study 2. Specifically, this test was identical to the one administered in Study 2, except that it included four additional vocabulary questions and one sentence translation question, in order to increase the difficulty of the exam. Once again, we included participant years of education and age as covariates in our analyses, and we measured perception of standards and intimidation in the same manner as in Study 2.

Results

Effects of price on performance. Looking first to the effects of price on performance, we find no significant main effect of the price manipulation in a oneway

ANCOVA analysis ($F(1, 113) = .76, p = .38$). Specifically, there were no performance differences between participants who were told that the tutorial was being offered at a discounted price ($M = 11.75$) and participants who were told that the tutorial was being offered at regular price ($M = 11.13$). To partially assess why this price manipulation did not influence performance, we recruited a separate group of 189 participants to use an unbranded version of the training product that featured only our price manipulation. Results of this separate analysis suggested no significant difference in test performance between participants in the full-price condition ($M = 11.60$) and those in the discount condition ($M = 11.64, t(187) = .09, p = 0.93$). One major difference between our paradigm and the Shiv et al. (2005a) paradigm that has previously reported positive performance effects of price is that our design did not involve actual payment for the product. Although higher prices can elicit increased quality expectations, the strength of this signal may not be strong enough to elicit performance effects when provided only as price information rather than as real costs that have been incurred by the participant.

Effects of brand on performance. At the same time, we find that consistent with our previous results, there is a significant main effect of the brand manipulation ($F(1, 113) = 4.839, p = .03$). Participants once again performed worse when the tutorial was MIT-branded ($M = 10.67$) compared to when it held a University of Phoenix brand ($M = 12.21$). We observed no interaction effect between the price and brand manipulations ($F(1, 113) = .302, p < .58$). As a result, we combined the discounted and full-priced data within each school condition to allow us to once again conduct a three-path mediation

analysis as in Study 2, to test whether performance standards and intimidation act as factors that mediate the relationship between brand status and performance.

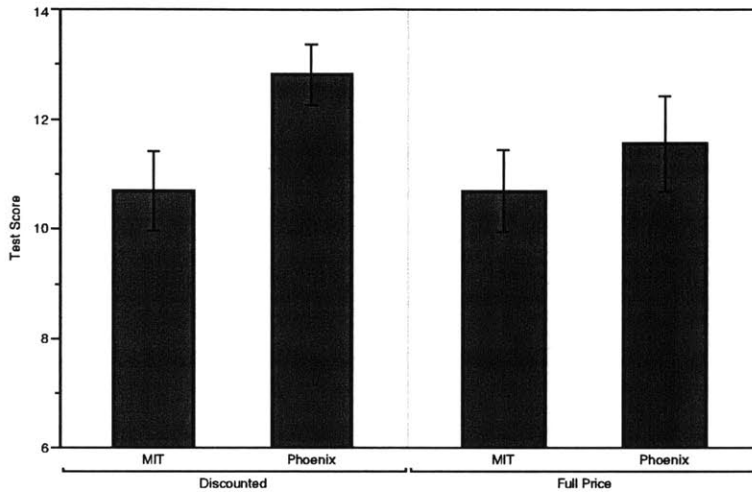


Figure 4. Performance drops when completing a high-status branded training program. No significant price effects are observed.

Mediation analysis. We once again tested whether perceived standards and self-reported intimidation levels mediate the relationship between brand status and performance. We find that perceived performance standards were higher when participants received the MIT training tutorial compared to the University of Phoenix tutorial ($M = 4.74$ vs. 3.96 , $F(1, 115) = 9.01$, $p < .01$). We also find that the perceived level of performance standards on the exam predicted participant levels of intimidation ($F(1,114) = 15.33$, $p < .01$). Incorporating all of the variables into a full model to predict test performance suggests that: (1) intimidation predicts test performance ($F(1,113) = 4.24$, $p < .04$), (2) school brand marginally predicts test performance ($F(1,113) = 3.54$, p

= .06), and (3) the effects of perceived standards on performance are insignificant ($F(1,114) = .30, p = .59$). Combined, these results provide additional support for the proposed mechanism that high brand status raises perceived performance standards, which increases intimidation and ultimately reduces test performance.

| IV | Standards (Mediator 1) | | Intimidated (Mediator 2) | | Performance (DV) | |
|--|---------------------------|----------|-----------------------------|----------|---------------------|----------|
| | <i>b</i> | <i>t</i> | <i>b</i> | <i>t</i> | <i>b</i> | <i>t</i> |
| Constant | 24.252*** | 27.938 | -4.629 | 1.713 | 9.290 | 1.452 |
| Education | -0.108* | 2.054 | -0.058 | 0.969 | 0.378** | 2.696 |
| Age | 0.005 | 0.521 | -0.011 | 0.897 | -0.007 | 0.267 |
| School | 0.771** | 3.002 | 0.227 | 0.763 | -1.312 | 1.881 |
| Standards | | | 0.407** | 3.916 | -0.124 | 0.479 |
| Intimidated | | | | | -0.451* | 2.058 |
| *** $p < .01$ ** $p < .05$ * $p < .10$ | | | | | | |

Table 2. Study 3 mediation regression results. High status brands inhibit performance by increasing perceived standards and thus intimidation.

STUDY 4

After demonstrating the reverse placebo effect in the contexts of both problem solving and learning, and after providing a mechanistic account of the processes involved in generating the effect, we finally explore the boundary conditions of the phenomenon. The following study addresses two main goals. First this study aims to identify sufficient conditions that are able to elicit performance effects by holding branding constant while manipulating only reference group comparisons. If the difference in reference group comparisons are indeed the main component of the brand differences that drive negative

performance outcomes, we should expect that changing only the reference group comparison within the same brand will be sufficient to elicit performance effects. Second, we address the issue of when it may be the case that reference group comparisons actually do lead to positive rather than negative performance outcomes. Since it is known that people often assimilate the features of comparison targets when the target is considered to be similar, we anticipate that in a population of participants that are similar to the comparison targets, people will assimilate towards high-performing reference others, leading to positive performance effects. In a parallel fashion, when comparison targets are perceived to be similar and are low-performing, individuals will assimilate downwards and exhibit negative performance effects.

Method

Participants. A total of 135 students at the Massachusetts Institute of Technology (65 women, 63 men, 7 unreported; average age = 29, SD = 4) in a master-level course completed the study for course credit. One non-MIT student auditor was excluded from the sample in order to ensure that comparison targets were indeed considered to be similar.

Procedure. All participants completed a version of the brain training paradigm, similar to that in Study 1 where each participant completed two tasks: first a brain training exercise and then a cognitive ability exam. Both the content of the training programs and the branding throughout the training task were held constant. Participants

were informed that the training program was developed for MIT students and saw training pages that featured MIT logos.

Participants were randomly assigned to one of three conditions: (1) a high-performance reference group, (2) a low-performance reference group, or (3) a control condition. Prior to the training task, participants were asked to read a profile about a current MIT student named Eric. In the high-performance reference group condition (MIT High), the story described a student that had no problem adjusting to MIT and had a transcript “filled with many A’s and a few B’s” while in the low-performance reference group condition (MIT Low) the story described a student that had difficulty adjusting and had a transcript “filled with many B’s and a few A’s”. An independent pretest sample with 40 individuals indicated that participants agreed that Eric seemed to “perform very well on exams” in the high-performance condition compared to the low-performance condition (90% vs. 0%, $\chi^2 = 33.4$, $p < .01$). The control condition involved no student profile prior to the training task and featured no branding during the training program.

As in Study 1, the training task again involved a version of the high number task from the Brain Age cognitive training game. After the training program, participants completed a cognitive ability exam identical to that in Study 1, which was made up of challenging math, verbal, and emotion identification questions in order to measure efficacy of the cognitive training program. Finally, participants were asked to respond to several manipulation check questions.

Results

Manipulation check. Confirming our pretest results, participants in the high-performance reference group condition did indeed evaluate the performance of the reference group to be high compared to those in the low-performance condition (83% vs. 10%, $\chi^2 = 49.5, p < .01$).

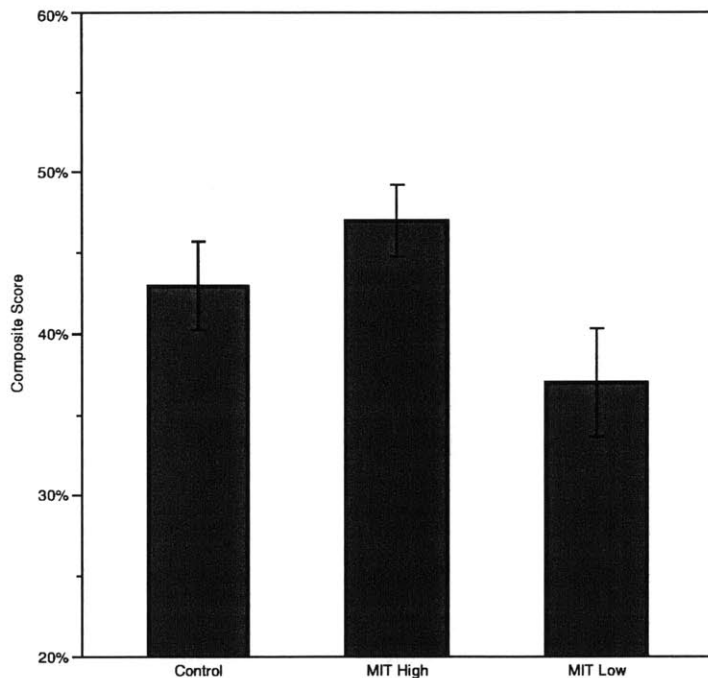


Figure 4. When reference group comparisons involve similar others, positive performance effects are observed.

Positive performance effects. Scores on the cognitive ability exam were once again combined first into a composite score weighing each portion of the exam equally. We find that within our population of MIT student participants, performance increased in

the presence of high-performance others and decreased in the presence of low-performance others, relative to the control (oneway ANOVA $F(2,131) = 3.21, p = .04$). Furthermore, comparing directly the performance levels when participants read a profile about a successful MIT student versus a relatively unsuccessful MIT student, we find that scores on the cognitive ability exam increase by about 10 percentage points (47% vs. 37%, $t(86) = 2.51, p = .01$). Individual comparisons of the high-performance reference group condition with the control and low-performance condition with the control reveal differences that are not significant, suggesting that the effect is caused by a bidirectional movement towards both increased performance in the presence of high-performing MIT students and decreased performance in the presence of low-performing MIT students. These results are robust when controlling for age and education level as covariates ($b = .04, F(1,81) = 4.38, p = .04$).

GENERAL DISCUSSION

In the studies presented here, we document a performance reducing effect of high-status brand products. We observed that participants that used high-status brand products designed to improve performance actually performed worse when completing subsequent diagnostic tasks compared to participants using identical products of a low-status brand. Our evidence supports an account that elaborates on the belief-expectancy-outcome framework by introducing reference points in the formation of performance beliefs. Thus, our theoretical account identifies contexts in which positive beliefs about products actually lead to negative performance expectations and subsequently poorer behavioral

outcomes. In specific, we suggest that when individuals are presented with high-status brand products, reference group comparisons are made against high-performance others that lead to relatively poor expectations about one's own performance. We find that the reverse placebo effect is mediated by the level of the performance standard associated with the reference group. We also find that the effect is most pronounced among high self-monitors who are more likely to process brand-related information.

In Study 1, we manipulated the brand of a cognitive training program and found higher performance on mental acuity tests among participants that received the low-status brand manipulation. Extending our findings into the domain of language learning, Study 2 showed that people perform worse when acquiring a novel language when they receive a training tutorial with a high brand status. This study was also able to provide insight in the mechanism that drives the reverse placebo effect, illustrating that brands with higher status elicit reference group comparisons against highly-performing others. The extent to which people perceive the performance standards to be high drives feelings of intimidation which subsequently results in lower task performance. In Study 3, we found that brand manipulations continue to drive reverse placebo effects even in the presence of price manipulations and found supporting evidence for the proposed mechanism. In Study 4, we then find that when the high-performing reference others are similar MIT students, people assimilate towards the reference group and exhibit performance changes in the direction of the performance standard.

This work has uncovered a novel and perhaps cautionary finding that better brands may actually lead to worse performance outcomes. By extending the belief-expectancy-outcome framework to include the social comparison process involved in the

formation of performance expectations, we were able to identify a context in which positive beliefs about brand status actually lead to negative expectations of relative performance. Interesting lines of future research may aim to further elaborate on the ways in which performance expectations are formed. Taken together, this information will provide us with methods to improve product efficacy without altering core functional components of the product. We hope that this work stimulates future research that will help to identify ways in which marketing actions might not only increase the purchase of products but might also increase the benefits provided to the consumer.

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ESSAY 3

Altruistic Patience: When Giving More Beats Giving Now

Abstract

People are known to take into account the welfare of others when making decisions. Many of these settings also involve tradeoffs in the benefits that others receive at different points in time. For example, donors make decisions between giving to those in immediate need and funding longer-term projects, policy makers impact their constituents by responding to immediate concerns and also supporting larger efforts for reform, and even friends face the perennial gift-giving problem in picking either short-lived novelties or necessities that will last. This work identifies a bias in the intertemporal choices that people make when the consequences of those choices are not directly experienced by the decision maker. In particular, I find that people appear to be more patient when conferring benefits to others rather than themselves and that this bias is driven by both relaxed time sensitivity and by diagnostic motivations.

People commonly make decisions involving difficult temptations and tradeoffs that have both immediate and future consequences for their own well-being. These choices also frequently have ramifications for others and can thus involve tradeoffs between immediate and future consequences that are not directly experienced by the decision maker. Donors make decisions between giving to those in immediate need and funding longer-term projects; policy makers impact their constituents by responding to immediate concerns and also supporting larger efforts for reform; even friends face the perennial gift-giving problem in picking either short-lived novelties or necessities that will last. There exist a wide array of settings where a large component of the benefits of a choice are those conferred to others, and while people certainly take into consideration the welfare of others when making decisions (Camerer and Thaler 1995), little is known about how people evaluate intertemporal tradeoffs when the consequences are not directly experienced by the decision maker. Understanding exactly how people think about and discount the benefits that others receive at future points in time is thus a critical question that is the focus of this work.

In what way may decisions involving others differ from those involving the self? Recent studies have illustrated that people often experience a self-other empathy gap that leads them to underestimate the pains associated with paying for things (Frederick 2012), the burdens of providing help (Pronin, Olivola, and Kennedy 2008), and the uncertainty involved in risky decisions (Hsee and Weber 1997). Making decisions that impact others can thus increase the psychological distance associated with the choice, leading to underestimation of the costs of waiting and thus greater patience when deciding how to allocate benefits to others over future points in time.

In this work, I test whether people exhibit a bias when making choices where benefits are bestowed upon others rather than oneself. I observe that people are biased towards selecting delayed but larger payoffs when the benefits are given as donations to charitable organizations but not when they are delivered as bonuses to the decision maker. This bias is consistent with existing findings that have shown that costs tend to be underappreciated when making choices regarding psychologically distant targets. Here I consider two additional value-generating processes that may bias choices involving others towards deferral: anticipatory utility and diagnostic utility.

Anticipatory Utility

A number of experiences are enhanced by the postponement and savoring of them. When scheduling a fancy French dinner or a kiss from a movie star, for example, people often prefer to push these experiences back in time (Loewenstein 1987; Loewenstein and Prelec 1991). Doing so can increase utility derived from anticipation, or the hedonic experience of obtaining pleasure from thinking about future consumption events.

Making decisions that improve the well-being of others can also be inherently pleasurable experiences. In fact, donations made to charitable organizations engage the mesolimbic reward system in the same way as when basic rewards are obtained (Moll et al. 2006). Because the decision maker does not directly experience the benefits that are provided when giving to others, the rewards to the decision maker that are obtained through donating must be extracted by mental simulation of the welfare improvements of

others. Thus, pushing donations farther back in time can allow for a wider opportunity for the decision maker to derive anticipatory utility from a decision that affects another.

Diagnostic Utility

The actions that people take sometimes have the property of revealing information about traits that the decision maker may be uncertain over but concerned about. For example, Quattrone and Tversky (1984) showed that when people were told that life expectancy was associated with tolerance to cold water, people changed their tolerance in a direction that would elicit a favorable diagnosis. This motivation to achieve diagnostically positive outcomes can be described by a self-signaling mechanism (Prelec and Bodner 2003) whereby selection of the action that provides the most favorable information on the trait of interest, relative to the other options available in a choice set, extracts the most diagnostic utility.

Decisions involving others can also have diagnostic value. When people decide to donate towards a charitable organization, perceptions of their own altruistic disposition increase (Bodner 1996). In a setting where people make donation decisions that have both delay and amount attributes, making a decision that improves either attribute could provide diagnostic value. Because however the value of an extra dollar towards a charitable cause may be easier to interpret than the value of one less day of waiting, people may rely more heavily on the monetary amount when deriving diagnostic utility from an intertemporal tradeoff choice (Shah and Oppenheimer 2007). Thus, diagnostic motivations may lead people to be biased towards larger payoffs later over smaller

payoffs sooner since these choices would be able to provide better signals of altruistic disposition.

OVERVIEW OF THE EXPERIMENTS

The studies here focus on decisions made towards charitable organizations. Studies 1 and 2 test whether people exhibit a bias when making intertemporal choices involving others compared to when making equivalent choices for oneself. After finding that people appear to be more patient when the decision maker does not directly experience the consequences of the choice, Study 3 then explores how sensitivity to the time dimension changes when making choices involving others. Studies 4 and 5 then consider two additional substantive differences that may contribute to the bias, anticipatory utility and diagnostic utility.

STUDY 1A

Study 1 first aims to test whether people exhibit a choice bias when making intertemporal tradeoff decisions that involve donations towards causes that affect others compared to decisions that involve their own payoffs. In order to test for a bias, participants are faced with choice options that are designed to be equally attractive under the null that there is no bias. Choice of immediate options with a frequency greater than chance suggests that people exhibit a bias towards impatience while choice of delayed options with a frequency greater than chance suggests that people exhibit a bias towards

patience. Study 1A presents such a choice involving donations and Study 1B presents a similar equivalence-point choice involving own bonuses.

Method

Participants. A total of 100 participants were recruited from a national sample and completed the study online in exchange for a small monetary reward (39 female, 46 male, 15 unreported; average age 33.4, SD = 12.5). Participants were asked to take the time to respond to each question as accurately and realistically as possible.

Procedure. All participants answered a series of three matching questions to construct a choice between options that would be equally attractive by design. After eliciting matching points, participants made a choice between these two subjective present-value matched options, with one option being a smaller donation made today and the other option being a larger donation made later. Choices on this question were thus able to provide a sensitive measure of bias towards patience or impatience when making choices where the consequences were not directly experienced.

Participants first completed the matching questions. All were told to consider receiving a bonus of \$1.25 today. Equivalence points between receiving a bonus today and receiving a bonus in 5 weeks were then elicited by responses to Q1 below:

Q1. What is the minimum amount that you would need to be paid in 5 weeks in order to wait for the slightly larger bonus?

After answering this question, participants were then asked to consider having a donation made in their name instead of receiving a bonus. The donation would be made towards an

endangered species supported by the World Wildlife Fund, and participants were randomly assigned to view either a Cross River gorilla or a Javan rhinoceros to provide variation in the charitable cause. To convey a sense of urgency, participants were given information about the critically endangered species. They were informed that only a few hundred such animals remained in the world and that their population was declining at an alarming rate. After receiving information about the charitable cause, participants were asked to provide an indifference point between receiving a bonus and having a donation made on their behalf. Participants offered an equivalence point between receiving a \$1.25 bonus for themselves today and having a donation made towards the World Wildlife Fund today by answering Q2 below:

Q2. What is the minimum amount that you would require be donated today so that you would support the fund to save the gorillas instead of taking the bonus?

As the final matching question, participants were asked to provide their indifference points between receiving a bonus in 5 weeks and making a donation in 5 weeks. They were told that the experimenter could provide the amount requested in Q1, and an equivalence point was elicited through a response to Q3:

Q3. What is the minimum amount that you would require be donated in 5 weeks so that you would support the fund to save the gorillas instead of taking the bonus in 5 weeks?

By construction, the responses to Q2 and Q3 should be equally attractive under the null hypothesis that there exists no bias. To test whether a bias exists, participants were finally asked to make a choice between a donation today and a donation later, where the two

options were selected such that they should be equally attractive to the individual.

Participants responded to the following choice question:

Choice. Suppose that the experimenter gave you the following choice for a donation that would be made on your behalf. Which option would you prefer?

___ Donate \$[Q2] towards saving the gorillas today

___ Donate \$[Q3] towards saving the gorillas in 5 weeks

___ Both options are equally attractive

Results

Whether donations were being made to save the gorillas or the rhinos made no difference and are thus collapsed in the main analysis. Behavior in the choice task suggests that participants have a bias towards larger and later options when making donation decisions, despite the fact that the options were constructed to be equally desirable. While 24% of participants did indeed indicate that the donation options were equally attractive, the remaining population reported a strict preference for one of the options. Among the 76% of participants that reported a strict preference, 71% chose the larger donation amount that would be given in five weeks while 29% chose the smaller donation that would be given today (see Figure 1). A Wilcoxon signed rank test indicates that this proportion of choices is significantly different from the 50% level that would be suggested by indifference (mean = .71, SD = .45, $T(75) = 616$, $p < .01$). This effect appears in each of the donation funds (Gorillas: mean = .74, SD = .44, $T(38) = 190$, $p < .01$; Rhinos: mean = .68, SD = .47, $T(37) = 123.5$, $p = .03$).

The tendency to be biased towards delayed but larger donations is not predicted by implied discount rates (likelihood ratio test $\chi^2 = .02, p = .89$), immediate bonus versus donation indifference points ($\chi^2 = .68, p = .40$), or delayed bonus versus donation indifference points ($\chi^2 = 1.85, p = .17$). However, the bias does appear to be related to the monetary difference in immediate versus delayed donation amounts ($\chi^2 = 6.33, p = .01$), suggesting that the changes in the relative importance of the payoff amount when making donation decisions may be one factor driving the effect.

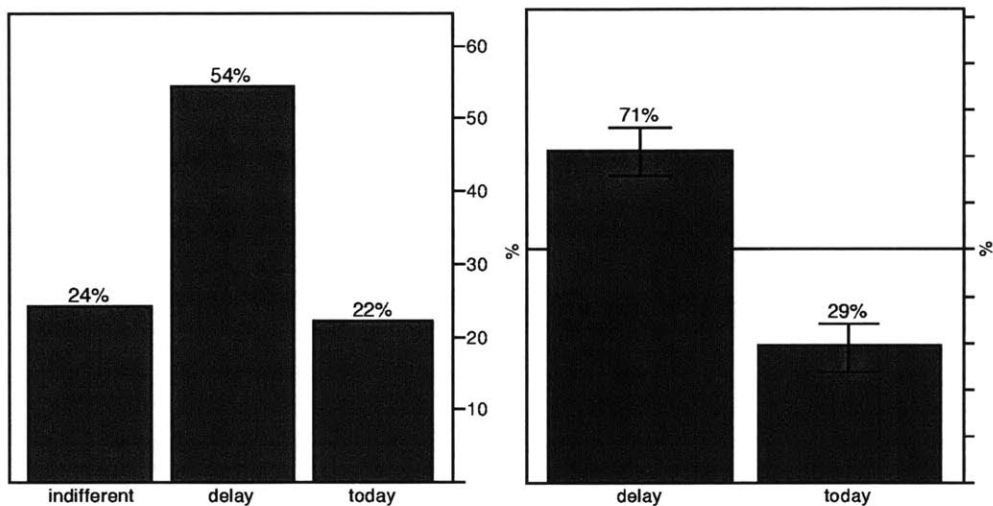


Figure 1. Choice frequency in Study 1, all choices (left) strict preference only (right), solid line indicates indifference

STUDY 1B

The following study presents a corresponding set of questions to Study 1A with the intent of eliciting a similar equivalence-point choice involving own bonus payoffs

rather than donations. Concerns of procedural elicitation artifacts are addressed by comparing choice patterns in this self-payoff context to the donation context in Study 1A.

Method

Participants. A total of 100 participants were recruited from a national sample and completed the study online in exchange for a small monetary reward (32 female, 68 male; average age 27.6, SD = 8.4). Participants were asked to take the time to respond to each question as accurately and realistically as possible.

Procedure. Once again, all participants answered a sequence of three matching questions in order to construct a choice between options that would be equally attractive under the null that there exists no bias. After eliciting matching points, participants made a choice between two present-value matched options, where one option was a smaller payoff delivered today and the other option was a larger payoff delivered later.

Again, a sequence of matching questions was completed first in order to construct the equivalence-point question. Participants were told to consider having a donation made in their name today to one of two critically endangered species supported by the World Wildlife Fund, either the Cross River gorilla or the Javan rhinoceros. Parallel to Study 1A, the matching questions then elicited equivalence points between having donation made now and having a donation made in 5 weeks (Q1), equivalence points between having a donation made today and receiving a bonus payoff today (Q2), and equivalence points between having a donation of the amount reported in Q1 made in 5 weeks and

receiving a bonus payoff for oneself in 5 weeks (Q3). Finally, participants made a choice between receiving the amount reported in Q2 today and the amount reported in Q3 in 5 weeks. By construction, these options were designed to be equally attractive under the null that no bias existed.

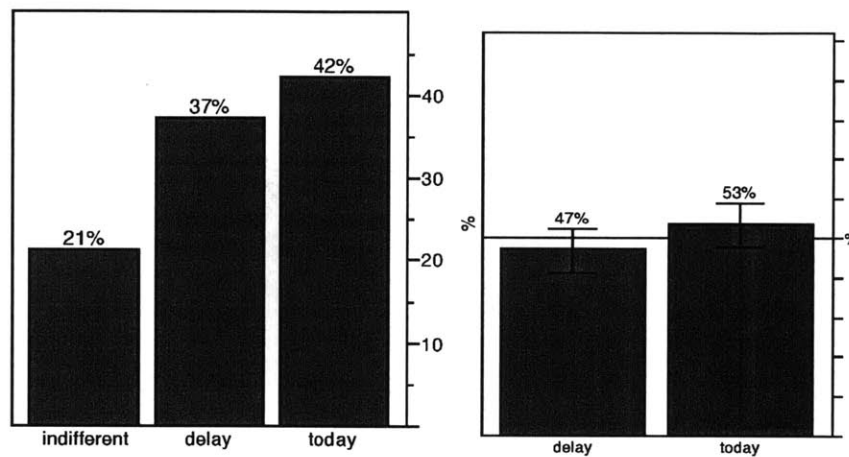


Figure 2. Choice frequency in Study 1B with all choices (left), strict preference only where solid line indicates indifference (right)

Results

Behavior in the choice task suggests that when making intertemporal choices involving one's own payoffs, participants are not detectably biased in any direction. In total, 21% of participants indicated that the bonus options were equally attractive. Among the remaining 79% of participants that reported a strict preference for one of the options, 53% chose the larger bonus amount that would be given in five weeks while 47% chose the smaller bonus that would be given today (see Figure 2). The proportion of choices is not significantly different from the 50% level that would be suggested by indifference

(mean = .46, SD = .50, Wilcoxon signed rank $T(78) = 100, p = .57$). This appears in each of the donation funds (Gorillas: mean = .41, SD = .49, $T(38) = 190, p = .26$; Rhinos: mean = .53, SD = .50, $T(37) = 20.5, p = .75$).

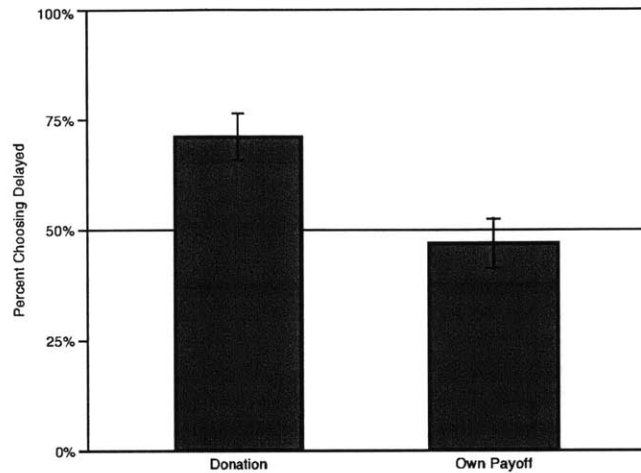


Figure 3. Choice frequency of delayed options in donations versus own payoff settings

Compared to the participants in Study 1A that made an equivalence-point choice between options involving donations, people exhibited relative indifference when making value-equivalent choices involving their own payoffs. Choice of the delayed option was observed significantly more frequently when choosing between donations than when choosing between bonus payments (donation mean 74% vs. own payoff mean 41%, $\chi^2 = 9.07, p < .01$). This suggests that the bias towards choosing the delayed option arises due to the involvement of donations towards others rather than due to the task structure.

STUDY 2

Study 2 builds on the findings of Study 1 in several ways. First, to address concerns that the choice options rather than the choices themselves were biased in Study 1, matching equivalents are elicited directly between payoffs that would be delivered today and payoffs that would be delivered later. To also check for robustness of the effect, responses are obtained with several time delays and amounts, choices are made on a task designed to elicit preference for immediacy under the null, and choices in this study involve another charitable cause, the Red Cross Disaster Relief Fund.

Method

Participants. A total of 200 participants from a national pool completed the study online in exchange for a small monetary reward (91 female, 109 male; average age 33.2, SD = 12.4).

Procedure. Participants were randomly assigned to one of two conditions in which payoffs either corresponded to donations made on their behalf or to bonuses received themselves at future points in time. Participants in the donations condition were first instructed that they would be making decisions involving donations that would be made on their behalf towards the Red Cross Disaster Relief Fund. Information about the Red Cross and their disaster relief efforts were provided. Participants in the bonuses

condition were instructed that their choices would involve receiving bonus payoffs at different points in time.

All participants completed three tasks: a matching task, a filler task, and a choice task. The matching task was completed first to elicit indifference points between an option that would be delivered now and an option that would be delivered at some future time. Three matching questions were presented that varied delay and amount. In each question participants were faced with two options: an immediate option with a specified amount and a delayed option with a specified time delay but a blank amount, as shown below:

Q1. Please consider the options below:
(Option A) Donate \$45 today.
(Option B) Donate \$ _____ in 90 days.

Fill in the blank with the amount that would make Option B just as attractive as Option A.

Participants were asked to fill in the amount that would make both options equally attractive in their view. In the donations condition, these amounts were the donations that would be made to the Red Cross on their behalf while in the own payoffs condition, these amounts were bonuses that would be received.

Following the matching task, participants completed a filler task for about two minutes to interfere with recall of responses. The filler task involved a series of arithmetic questions in which participants added, subtracted, and multiplied both dollar values and times.

Finally, after the filler task, participants completed a choice task to test for bias in decisions. The choice task involved three decisions that were constructed such that the delayed options would be dispreferred under the null that there is no bias towards postponement. Each decision presented the options from the matching question that the

participant had completed in the first task, however time delays were increased. For example, participants in the donation condition saw the choice below where the time delay was increased from 90 days to 120 days:

Choice. Which option would you prefer?

Donate \$45 today

Donate \$[Q1] in 120 days

Both options are equally attractive

By construction, choices on this task were expected to exhibit preference for the immediate option in each of these questions, and deviations towards the later option would indicate a bias for delay. An option to indicate that both choices were equally attractive was also offered.

Results

Responses on the choice questions were combined to create a measure of frequency with which participants exhibited bias towards delay. While the choice questions were designed to elicit preference for the immediate option under the null, responses indicate that participants make significantly more choices for delayed options when making donation decisions. Participants in the bonuses condition selected delay and indifference options on average 40% of the time compared to participants in the donation condition that exhibited a stronger bias towards delay and indifference options, choosing them 64% of the time on average ($t(198) = 4.47, p < .01$).

Looking within choices where only a strict preference was reported, it can again be seen that participants exhibit strict preference for delayed options more often when

making decisions that involve donations versus when making choices involving their own payoffs. People in the donations condition chose the delayed option 48% of the time while those in the own payoff condition chose the delayed option 30% of the time ($t(184) = 2.94, p < .01$). See Figure 4.

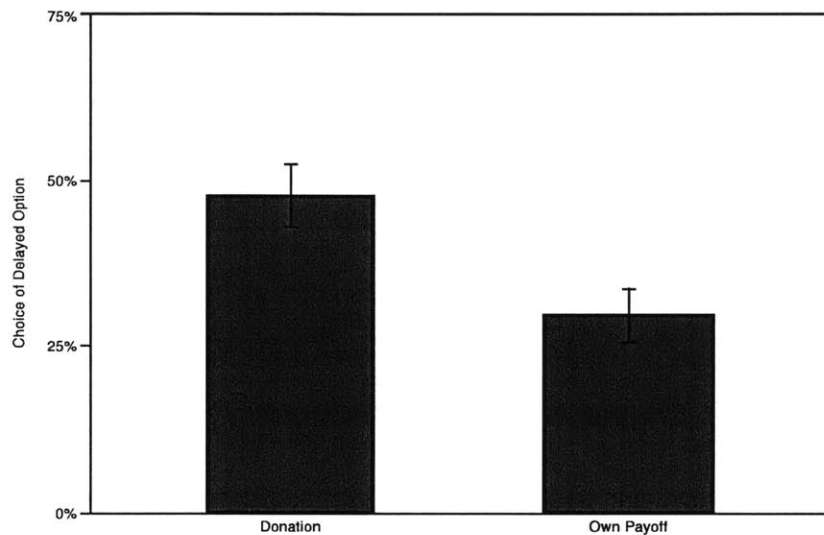


Figure 4. Choice frequency in Study 2. Participants exhibit a bias towards delay more frequently when making donation decisions than when making decisions involving their own payoffs.

STUDY 3

The next study aims to measure how estimates of individual discount rates for donations towards others differ compared to those estimated on involving bonus payoffs. Participants complete a standard time preference choice task and choices are then fit to a constant-sensitivity discounting model (Ebert and Prelec 2007) to provide insight into

how time sensitivity changes when making decisions that confer benefits not directly experienced by the decision maker.

Method

Participants. A total of 200 participants from a national sample completed the study online in exchange for a small monetary reward (111 female, 89 male; average age 35.2, $SD = 12.7$). A choice from each of the donation and bonus tasks was implemented for real to make the decisions incentive compatible.

Procedure. All participants completed two different discounting tasks to allow for a within-subject comparison. One task involved bonus payoffs that would be delivered to the participant and one task involved donations that would be made on behalf of the participant. The donation task referred to contributions that would be made towards the American Red Cross Disaster Relief Fund and all participants were given information about the efforts of the organization prior to the task.

In each of the discounting tasks, participants made 30 choices that offered two options, a larger amount that would be delivered with time delays ranging from 7 to 120 days and a smaller amount that would be delivered today. For instance participants were presented with the following choice:

Which option would you prefer?

Donate \$17.40 today

Donate \$34.80 in 60 days

Values of the choice options ranged between \$1 to just over \$100. Task order, question order, and choice order were fully randomized.

In order to measure changes to time sensitivity when making intertemporal choices involving others rather than the self, I fit the constant-sensitivity discounting model that allows discount rate effects and time sensitivity effects to be isolated. Discount factors are modeled by $f(t) = \exp(-(at)^b)$, where t indicates time delay. When the parameter $b = 1$, the standard compound discounting model is contained where a captures the discount rate. Time sensitivity is captured by b such that high levels indicate a strong present-future dichotomy in discounting patterns while low levels indicate that choices are made as if dealing with an extended present in which variation in time delays has little effect on the implied discount rate.

Results

Model parameters were estimated independently for each participant and each task by maximum likelihood. Standard random utility assumptions were made such that the probability of each choice options being chosen was a logistic function of the present discounted value of the options. This produced discount rate and time sensitivity estimates for each setting: where payoffs were own bonuses and where payoffs were those delivered to others through donations.

Results suggest that while discount rates appear to remain relatively stable across self-payoff and donation contexts, time sensitivity changes markedly. Discount rates were marginally lower when making decisions involving bonuses compared to when making

donation decisions ($a_{self} = .44$ versus $a_{other} = .50$, $t(199) = 1.66$, $p = .10$) while time sensitivity decreased significantly when making donation decisions ($b_{self} = 1.57$ versus $b_{other} = .87$, $t(199) = 3.67$, $p < .01$). This implies that preferences over donations are less likely to change when offered at different points in time relative to preferences over one's own payoffs, which appear to be highly influenced by time delay. These findings are consistent with evidence illustrating that the opportunity costs that others give up tend to be underestimated (Frederick 2012).

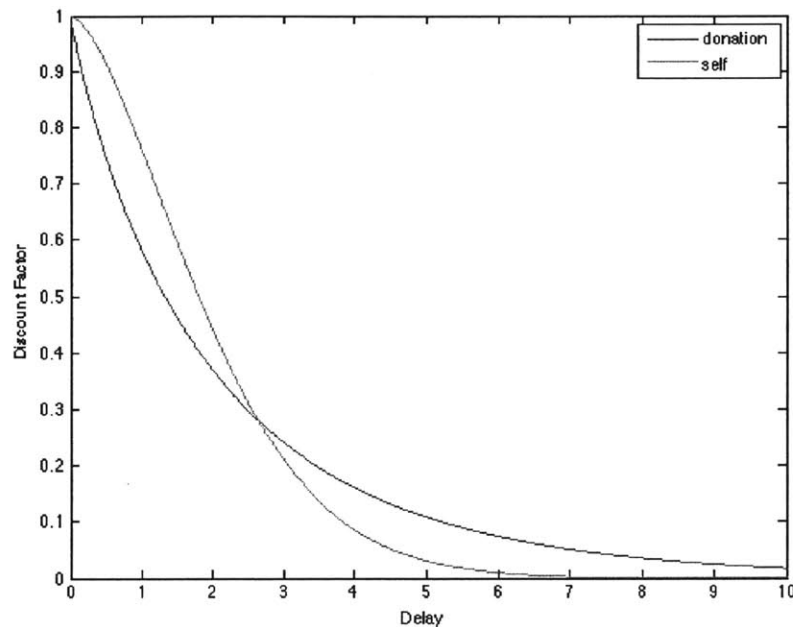


Figure 5. Discount functions in donations (blue) versus own payoffs (red). Participants exhibit decreased time sensitivity when making donation decisions.

Looking simply at choice frequency, we can also confirm that participants again appear to choose the delayed option more often when making donation decisions than when making decisions involving own payoffs. People choose the delayed option on

average 62% of the time when making donation decisions compared to 47% of the time when making decisions involving their own payoffs ($t(199) = 2.59, p = .01$).

STUDY 4

In order to identify other factors that may contribute towards the postponement bias when making decisions that affect others, in the next study I explore the hypothesis that anticipatory utility leads individuals to delay donations. Under this hypothesis, people may wish to push donations farther back in time in order to allow for more anticipatory consumption, since looking forward to a future donation may have hedonic value in itself. To probe whether donations elicit greater anticipatory utility compared to equivalent bonuses that people receive themselves, people were asked to provide their anticipated enjoyment of each of these prospects at future points in time. Comparing anticipated enjoyment prior to and after the target event allows us to establish whether increased anticipatory enjoyment of donations may contribute towards the observed bias.

Method

Participants. A total of 50 participants were recruited online from a national sample and completed the study in exchange for a small monetary reward (16 female, 34 male; average age 28.2, $SD = 6.76$). All participants were asked to take the time to consider each situation carefully.

Procedure. Participants were asked to consider donations that would be made on their behalf towards the Red Cross Disaster Relief Fund. Details on the disaster relief efforts of the Red Cross were provided prior to completing the tasks.

All participants completed two tasks: a matching task and an evaluation task. In the matching task, participants responded with indifference points between having a donation made at a future time point and instead receiving a bonus payment for themselves at that time. Participants were asked to fill in the amount that they would need to receive at the future time point in order to make both options, having a donation made and receiving a bonus payoff, equally attractive. For example, participants answered the following question:

Q1. Please consider the options below:
(Option A) Donation of \$50 made to the Red Cross in 30 days.
(Option B) Receive \$_____ yourself in 30 days.

Fill in the blank with the amount that would make Option B just as attractive as Option A.

Following the matching task, participants were then asked to evaluate four different scenarios corresponding to the options presented in the matching task. Two scenarios involved donations being made at future time points and the remaining two involved the matched-equivalent payments that would be received at future points in time corresponding to the respective donations. In each scenario, participants were asked to indicate how good they anticipated feeling about prospect at different points in time. Each question asked for anticipated enjoyment at two points before the event and two points after the event. Participants responded to these questions for both donations and for bonuses. Responses were obtained on a 10-point scale (1 = very bad, 5 = neutral, 10 = very good; see Figure 6).



Consider a donation of \$50.00 made on your behalf to the American Red Cross Disaster Relief Fund in 30 days.

How good do you anticipate feeling about the donation?

| | very bad | | | | neutral | | | | very good |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| How good would you feel today ? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| How good would you feel two weeks before the donation is made? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| How good would you feel one week before the donation is made? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| How good would you feel on the day the donation is made? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| How good would you feel one week after the donation is made? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| How good would you feel two weeks after the donation is made? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Figure 6. Anticipation of future benefits task.

Results

Responses on the two donation and two bonus payment scenarios were averaged to map out anticipated benefits over time in each of the settings. If anticipatory utility derived from donations contributes towards the bias towards postponement observed, we should expect there to be more anticipatory benefits prior to the donation than there are prior to a matched bonus payment. Comparison of the average anticipated pleasure that people expect to experience reveals no difference between donations and bonuses ($M_{\text{donation}} = 5.97$ vs. $M_{\text{bonus}} = 6.18$, $t(49) = 1.08$, $p = .29$). Comparisons within each scenario and within only one time point prior to the event are not significantly different between contexts ($ps > .30$).

Moreover, responses show that individuals actually anticipate more post-donation glow than they do pre-donation anticipatory pleasure. People in fact responded with lower pre-donation anticipation (5.96 before vs. 6.38 after, $t(49) = 2.07$, $p = 0.04$) while there was no difference in the distribution of anticipated benefits when anticipating matched monetary payoffs (6.18 before vs. 6.40 after, $t(49) = 1.22$, $p = 0.23$).

STUDY 5

An additional factor that may contribute to the bias towards patience in choices that involve others is the diagnostic utility that the decision maker may obtain from making choices that provide signaling value. When deciding between giving a smaller amount now and giving a larger amount later, people are able to learn about their own traits, in particular their altruistic disposition. Thus, making choices can provide diagnostic value to the decision maker and may lead to bias towards some options if they better signal high altruistic disposition. Contributing money rather than immediacy to a charitable organization is easier to value, and we have also seen that sensitivity to the time appears to be diminished in the donation context. This study tests the hypothesis that greater differences in subjective present-value matched donation amounts nonetheless lead to increases in the diagnostic value of the decision.

Method

Participants. A total of 100 participants were recruited from a national sample completed the study online in exchange for a small monetary reward (38 female, 62 male; average age 32.3, SD = 11.7). Participants were asked to consider donations that would be made on their behalf towards the Red Cross Disaster Relief Fund.

Procedure. All participants completed two tasks: a matching task and an evaluation task. First, matching equivalents were elicited between a donation of \$35 made today and a donation being made after 30 days, 90 days, and 120 days. Participants were asked to indicate the amount that would make both options equally attractive. This procedure allowed for choices to be presented with present-value matched options in the subsequent task. For instance, participants answered the following question:

Q1. Please consider the options below:
(Option A) Donate \$35 today.
(Option B) Donate \$_____ in 30 days.

Fill in the blank with the amount that would make Option B just as attractive as Option A.

Next, in the evaluation task, participants were shown three different pairs of choice options corresponding to the present-value matched equivalents elicited from the first task. For each pair of choices, participants were asked to indicate which choice option better reflected the target qualities of humanitarian concern, being a giving person, and selfishness as well as decoy qualities that included talent and laziness. Responses were obtained on a 7-point Likert scale (1 = definitely option A, 7 = definitely option B, 4 = options are about the same; see Figure 7).

Consider the two options below:

(Option A) Donate \$35 today.

(Option B) Donate \$50 in 30 days.

Choosing which option would suggest that you **care more about the cause?**

| | | | | | | |
|------------------------|-----------------------|-----------------------|-------------------------------|-----------------------|-----------------------|------------------------|
| definitely Option A | | | options are about the same | | | definitely Option B |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Figure 7. Evaluation task.

Results

Responses to the target qualities were first combined into a scale measure of altruistic disposition (Cronbach's $\alpha = 0.78$) and non-diagnostic traits were combined into a control measure ($\alpha = 0.63$). Based on a regression of the altruistic disposition measure on the difference in donation amounts of the two options, it can be seen that greater monetary differences predict more extreme evaluations of signal value in choosing the delayed option when the traits being evaluated are related to altruistic disposition ($b = 0.86$, $t(298) = 6.86$, $p < .01$; subject-level random effects, \$100 units). This suggests that more diagnostic value is provided when choosing value-equivalent donation options that provide a larger monetary amount. Moreover, no effect is observed on non-diagnostic attributes ($b = 0.09$, $t(298) = 1.18$, $p = .24$; subject-level random effects, \$100 units).

Greater monetary differences in the immediate versus delayed donation equivalents predict increased diagnostic value in each of the time points, at 30 days, 90 days, and 120 days delay. Regression results indicate that similar effects exist at each of these time points (30 days: $b = 0.23$, $t(98) = 2.54$, $p = .01$; 90 days: $b = 0.90$, $t(98) = 3.93$, $p < .01$; $b = 0.79$, $t(98) = 3.90$, $p < .01$; \$100 units).

GENERAL DISCUSSION

The studies presented here establish that people exhibit a bias towards patience when making intertemporal choices that involve conferring benefits to others through donations. I find that people are more willing to wait for larger rewards that are given to others than they are willing to wait for comparable rewards that they receive themselves. This bias appears to result from the fact that people are less sensitive to time delays when others experience them and that they rely on the monetary amount of a donation as a signal that provides diagnostic value in learning about their altruistic disposition.

In Studies 1 and 2, I showed that when faced with equivalence-point decisions, people appear to be biased towards selecting larger, later donations that others benefit from but are not biased towards selecting larger, later bonuses that they themselves receive. In Study 3, a discounting task was used to measure preferences over options with varying intertemporal tradeoffs and illustrated that individuals exhibit less time sensitivity in the context of donations relative to bonuses. Study 4 then explored the hypothesis that increased anticipation of planned donations drives the tendency towards postponement. In fact it is found that people anticipate deriving more pleasure after the donation is made, a finding that should actually bias individuals towards impatience rather than patience. Finally in Study 5, I find evidence that suggests that the monetary difference between sooner and later donations can act as a signal of one's own altruistic dispositions. Selection of present-value matched choices that make larger total contributions can thus provide diagnostic benefits that become salient when faced with the choice.

There exist a number of different settings in which a both small and large components of the consequences of a choice are those experienced by others. Even individual decisions that are centered on one's own welfare may have downstream consequences that impact the future payoffs experienced by others, and these effects are frequently of concern to the decision maker. For instance, an individual's decision to receive an influenza vaccination can both reduce the decision maker's own future chance of contracting the virus while also impacting the future likelihood of others becoming sick. While people may make vaccination decisions based on the tradeoffs between present and future individual benefits, highlighting the social impact of these decisions may be able to bias individuals towards making more forward-looking choices. Similar problems are found in many settings in which individual self-control failure can create negative externalities for others. For example smoking, defensive driving, or excessive energy use, while often construed by the decision maker as an individual self-control problem, can potentially be managed by manipulating the salience of the consequences that are experienced by others.

These results also take a step towards understanding time preference through a multiple-motive approach (Frederick, Loewenstein, and O'Donoghue 2002) and provide insights into the systematic biases people exhibit when making intertemporal choices involving others. Altruistic choices have in fact been shown to be remarkably consistent (Andreoni and Miller 2002; Fisman, Kariv, and Markovits 2007), and these altruistic considerations drive a wide array of important everyday decisions. Thus, explorations of exactly how social considerations influence central decision making constructs such as time preference, risk preference, and multiattribute choice more generally, may provide a

set of stable and predictable biases that allow for a wider understanding of how people make decisions involving others.

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