



# ASSOCIATION FOR CONSUMER RESEARCH

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Labovitz School of Business & Economics, University of Minnesota Duluth, 11 E. Superior Street, Suite 210, Duluth, MN 55802

## **Saving For the Future Self: Neural Measures of Future Self-Continuity Predict Temporal Discounting**

Hal Ersner-Hershfield, Stanford University, USA

G. Elliot Wimmer , Stanford University, USA

Brian Knutson, Stanford University, USA

According to the future self-continuity hypothesis, individuals perceive and treat the future self differently from the present self, and so might fail to save for their future. Neuroimaging offers a novel means of testing this hypothesis, since previous research indicates that self- versus other-judgments elicit activation in the rostral anterior cingulate (rACC). Using event-related functional magnetic resonance imaging (fMRI), we predicted and found not only individual differences in rACC activation while rating the current versus future self, but also that individual differences in current versus future self activation predicted temporal discounting assessed behaviorally a week after scanning.

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## SPECIAL SESSION SUMMARY

### Long-term Decisions and Focusing on the Future

Daniel M. Bartels, University of Chicago, USA

#### SESSION OVERVIEW

How people think about and choose between immediate outcomes and those in the more distant future has been one of the central issues in consumer behavior, and behavioral science more generally (Loewenstein, Read, and Baumeister 2003). Building on the existing diverse literatures on time discounting (Frederick, Loewenstein, and O'Donoghue 2002), construal level theory (Trope and Liberman 2003) and the philosophy of personal identity (Martin and Barresi 2002), the proposed session will contribute to a better understanding of how evaluations and decisions are driven by perceptions of how our future-self will experience potential long-term outcomes. The papers investigate how the degree to which we both attend to the future and feel connection to that future self affect the pursuit of gains over concern for losses, the exertion of self-control in the face of depletion and the willingness to defer compensation in favor of longer-term gains. This session will unify the findings of the individual papers into a broader framework for investigating the impact on consumer choice of how we think about the self in the context of the future.

Given the relevance of the proposed topic to central issues in consumer research, this session is likely to have a significant effect on future research in a number of areas and contribute to a cross-pollination of approaches to studying long-term outcomes. The papers employ a variety of approaches (lab and field experiments, as well as neuro-imaging), and the session will offer a broad perspective on the ways in which the degree of goal proximity plays a role in consumer behavior.

In the first paper, Shu provides evidence that while individuals focus on losses in immediate choices (per prospect theory), they instead focus on gains when thinking about themselves in the more distant future. This long-run focus on gains leads to a systematic difference in outcome valuations and choice in gambles and political choices for the long vs. short-term.

Both the Bartels, Urminsky, and Rips and the Ersner-Hershfield, Wimmer, and Knutson papers examine the influence of perceived psychological connectedness (i.e. continuity with future selves) on intertemporal choice. Bartels, Urminsky and Rips demonstrate that to the degree people anticipate changes in identity, they are less willing to defer benefits. They show that when people's own sense of continuity with the future self is reduced, they accept smaller, sooner monetary rewards, become less willing to wait to buy a computer in order to save money, and demand a larger delay premium to receive a gift card. Neuro-imaging research by Ersner-Hershfield, Wimmer and Knutson provides further evidence for the link between perceiving discontinuities and greater discounting of long-term outcomes. They ask participants to make judgments about the current and future self, and other people and compare levels of activation in areas of the brain associated with thinking about the self to those associated with thinking about social targets. They find that those people for whom thinking about the future self resembles thinking about other people (in terms of the neural activation elicited) had a stronger tendency to devalue delayed monetary rewards.

Lastly, research by Agrawal and Wan examines how drawing attention to the future vs. the present (construal level) influences the performance of consecutive self-control which requires sustained effort and is vulnerable to self-control resource depletion effects. When thinking about the future, individuals focus on goals relevant

to the future self (e.g., health goals) and exert self-control depending on the importance of the task to their long-term goal. In contrast, when focused on the present, individuals attend to the resource accessibility experienced by the current self and will exert self-control depending on their perceived fatigue.

Given the centrality of long-term outcomes in this session, we anticipate that it will build toward an integrated intuition that contrasts a short-term decision maker, disconnected from the future self, who is impatient, loss-averse and impacted by depletion with a long-term decision maker, connected to the future self, who is more patient, gains-seeking and focused on goals. The session chair will facilitate audience discussion that explores relationships between the papers.

#### EXTENDED ABSTRACTS

##### "The Role of Self-Connectedness in Short Run Losses and Long Run Gains"

*Suzanne Shu, UCLA, USA*

Research on optimistic predictions finds that thinking about positive outcomes can affect judgment. For instance, as individuals think about a desirable focal outcome, they often put undue weight on that outcome relative to other possibilities; this has effects on probability estimates, affective forecasting, and other judgment tasks (Koehler 1994; Wilson et al. 2000; Rottenstreich and Kivetz 2006). Additional work has looked at how these optimistic predictions vary over time. Individuals are typically more optimistic the farther they are from the point at which the outcome will become known (Gilovich, Kerr and Medvec 1993), while work on resource slack, temporal construal, and regulatory focus also offers evidence that individuals see far-off things more holistically and positively than immediate events (Trope and Liberman 2003; Zauberman and Lynch 2005; Pennington and Roese 2003; Eyal et al 2004).

While much of the prior research has focused on outcome predictions or reasons for or against an option, less has been done to explore how optimistic predictions influence valuation and choice for future risky outcomes. For example, we know that for immediate gambles, individuals are loss averse (Kahneman and Tversky 1979). But for far-off gambles, is it possible that some form of optimism bias or wishful thinking causes the individual to focus on the gain outcome rather than the loss outcome? And what might this imply for valuation of those future outcomes within a Prospect Theory framework?

The research presented here suggests that individuals put more focal attention on gambles' gains for long-run outcomes, but shift attention toward losses in the short run. This occurs both for scenarios when the loss is incurred immediately (lottery ticket purchase) or expected to occur in the future (casino gamble). This overall pattern suggests that losses dominate in the short-run but that gains become the focal outcome as distance from the loss increases. Stronger focal attention on gains relative to losses for long-run outcomes has implications for how choices are evaluated, with the result that gains are more heavily weighted for a far-off outcome. This differential attention to gains and losses for temporally removed risky outcomes applies to many decision-making domains; for example, a study of two messages, matched for overall content, finds that participants prefer a hope message focused on

future gains over a “reverse losses” message when the choice is for a future term, but they prefer a “reverse losses” message when the choice is for the present term.

These findings suggest that curvature of the Prospect Theory value function may change once time is incorporated. Prior research on loss aversion has suggested that loss aversion has a basis in emotional reactions to the outcomes—specifically, a more emotionally charged reaction to negative outcomes, consistent with work on visceral effects and empathy gaps. Solicitation of individual Prospect Theory value functions once temporal distance has been manipulated shows that loss aversion diminishes as individuals feel themselves to be farther in time from the gamble they are considering.

The final study examines whether the differential focus on losses and gains is a function of how connected the individual feels to their future self. A test of Prospect Theory style gambles for individuals considering themselves at future times shows that gamble choices shift according to the degree of connectedness participants feel with that future self, based on a connectedness measure from Parfit (1984) and used by Bartels, Urminsky, and Rips (2009), suggesting that high connectedness is an important aspect of short-run loss aversion. Thus, it is actually degree of connectedness, rather than absolute temporal distance, which affects valuation.

Together, these studies provide evidence that individuals focus on loss outcomes in the short run but gain outcomes in the long run, that this long-run focus on gains has measurable impact on choices and valuations, and that this focus is moderated by individuals’ feelings of connectedness to their future selves. A better understanding of how individuals evaluate short run losses and long run gains may provide useful insight into human capital investment, risk taking, and other long run behaviors.

#### **“How the Perceived (Dis)Continuity of Identity Affects Intertemporal Choice”**

*Daniel M. Bartels, University of Chicago, USA*

*Oleg Urminsky, University of Chicago, USA*

*Lance J. Rips, Northwestern University, USA*

The literature on time preference has documented extremely high implicit discount rates in both hypothetical choices and observed behavior as well as inconsistency in the discount rate over time (Ainslie 1975; Thaler 1981; Frederick, Loewenstein, and O’Donoghue 2002). Economists offer several reasons why a rational actor might choose to consume a smaller amount of some good now, rather than a larger amount later—most of which concern the way that time affects the magnitude (or probability) of utility conferred by a delayed consumption experience. Most of these accounts of rational choice assume, however, that the preference for sooner-smaller options is due to the need to be compensated for the delay of benefit being received only by the future self, who is otherwise undistinguished from the current self. In this view, rationality demands acting in a manner consistent with maximizing some function of self-interest over time, and that the implied discount rate should relate to the cost of capital, and perhaps a risk premium relating to illiquidity or loss of the delayed outcome (Samuelson 1937); deviation from this rule has been characterized as myopia (e.g. Strotz 1955).

One account that differs radically from standard economic views is offered by Parfit (1984), who maintains that rationality does not require you to treat all parts of your life equally: He argues that personal identity consists of a series of partially-overlapping persons extending over time. One implication is not all descendant future selves are equally “you”. Thus, just as you are not rationally required

to care as much about others’ welfare as your own, so too, if your descendent future self is sufficiently different in terms of personality, beliefs, and desires from your current self, you are not rationally required to care as much about your future self’s welfare. Impatience can thereby be justified, distinct from normative discounting, by anticipated changes in connectedness over time.

In the current studies, we test the influence of people’s intuitions about the (in)stability of personal identity over time on (im)patience for future utility. Study 1 investigated the relation between elicited patience and perceptions of psychological connectedness in people’s judgments about their own future selves. Participants in this study rated the connectedness between their present state and their likely state at different times in the future and made judgments about the equivalence of present and future goods. We observe greater impatience in time periods with larger decreases in connectedness, consistent with connectedness explaining non-constant discounting.

In Study 2, we rule out a time perception explanation, using a projective method, in which participants read about fictional characters experiencing symbolically life-changing events (such as a religious conversion) that would normally decrease psychological connectedness but not impact monetary outcomes. We balanced the life-changing events so that they happen to different characters at different points in the future. Participants made timing decisions for annuity payouts on behalf of these characters. In time intervals perceived to represent large changes in psychological connectedness, participants made relatively impatient decisions—choosing to cash in annuities more quickly than for those intervals where they perceive smaller changes in connectedness.

In Study 3, we presented undergraduates with hypothetical choices between sooner, smaller valued gift cards versus gift cards plus a delay premium after reading either that identity changes radically in early adulthood (especially during the college years) or that the core features of one’s identity are fixed in early childhood (and stable during college). Participants demanded a greater delay premium after reading about how they would change than after reading stability of identity.

In Study 4, we manipulate people’s certitude in the stability of their identity indirectly, by asking them to judge how difficult it would be to generate either 2 or 10 reasons why their identity will remain very stable over the next 12 months. Participants in the 2 reasons condition reported less difficulty with the reason-generation task, and subsequently exhibited greater patience about when to buy a computer expected to decline in price over the next 12 months.

In Study 5, we conducted a field study using similar methods as Study 3. College seniors who were about to graduate read a passage that described graduation as either a major life-changing experience or one not impacting self-identity and chose between lotteries for delayed gift cards of increasing value over time. When participants were told their impending graduation presaged a major (vs. trivial) change in self-connectedness, they exhibited more impatience and were more likely to choose the smaller-sooner gift card. The effect was robust controlling for their individual beliefs about future availability of money and time after graduation.

In all five studies, we find evidence that when large changes in psychological connectedness are anticipated, people behave relatively impatiently—choosing to speed up the consumption of utility. Conversely, when anticipating small changes, people appear more patient. Our findings have the potential to shed light on the long-standing issues of “excessively” high discount rates as well as nonconstant discount rates.

### “Saving for the Future Self: Neural Measures of Future Self-Continuity Predict Temporal Discounting”

*Hal Ersner-Hershey, Stanford University, USA*

*G. Elliott Wimmer, Stanford University, USA*

*Brian Knutson, Stanford University, USA*

Why do some people fail to save for the future? Theorists from economics, philosophy, and psychology have characterized saving as an “intertemporal choice” problem involving a decision between benefits that occur now versus in the future (Frederick, Loewenstein, and O’Donoghue 2003). Research shows that people often care less about future outcomes than they do about present ones, a phenomenon known as temporal discounting (Frederick 2003). According to an early model of temporal discounting, while people devalue future gains as a function of temporal distance from the present, individuals vary in the degree to which they devalue future gains. This tradeoff between time and magnitude was originally described with an exponential function (Samuelson 1937), but is better fit by a hyperbolic or quasi-hyperbolic function (Laibson 1997).

Theorists have argued that temporal discounting might emerge from conflicts of interest between temporally different selves (Parfit 1971; Schelling 1984). According to this view, psychological connectedness of the present to the future self varies as a function of time, such that people feel more connected to their potential self of five years than their potential self of fifty years. Thus, people might care less about more temporally distant future selves to the point at which an extremely distant future self may seem like a different person altogether (Parfit 1971; Pronin and Ross 2006). This “multiple selves” view has implications for financial saving. If people consider the future self as a stranger, then they may rationally have no more reason to save money for themselves than to give the money to a stranger. Critically, this account predicts that the degree to which an individual feels disconnected from his or her future self should correlate with the degree to which that individual discounts future rewards (i.e. the “future self-continuity hypothesis.”)

Neuroimaging methods allow for a novel way of testing this hypothesis. Previous neuroimaging research suggests that people show decreased activation in cortical midline structures when considering information about others versus the self (Kelley et al. 2002), and increased activation when engaging in self-reflection or introspection (Raichle et al. 2001). If people effectively consider their future selves as others, judgments about the future versus current self should elicit reduced activation in cortical midline structures. Further, individuals with greater decreases in activation for the future vs. current self should more steeply discount future rewards.

The goal of this experiment was to determine whether neural indices of future self-continuity could predict temporal discounting. To test these hypotheses, subjects were scanned with event-related fMRI while making judgments about the extent to which trait adjectives applied to their current self, a future self, a current other, or a future other. A week later, subjects completed a temporal discounting task that yielded an estimate of the degree to which each individual discounted future rewards. Analyses focused on changes in activation in the MPFC and rACC during current vs. future self-ratings. First, we predicted that rating the self versus another person would increase activation in the MPFC and rACC (Kelley et al. 2002), consistent with previous findings. Second, we predicted that rating the current versus future self would increase MPFC and rACC activation. Finally, based on the future self-continuity hypothesis, we predicted that individual differences in current versus future self rating elicited MPFC and rACC activation would predict individual differences in temporal discounting, tested behaviorally at least a week later. This represents the first attempt to link a neural index of future self-continuity to temporal discounting.

Results indicated that there was a neural difference between thoughts about the current self versus thoughts about the future self: there was greater activation in a portion of the anterior cingulate cortex for current self compared to future self judgments. Importantly, lending support to the future self-continuity hypothesis, individual differences in the magnitude of this effect predicted the tendency to devalue future rewards. That is, the greater the difference in neural activation between current self and future self judgments, the more a given individual discounted future rewards. If individual differences in savings partially depend upon future self-continuity, then savings behavior might be modified either by altering perceptions of the future self or by projecting the current self into the future. The findings thus may hold implications both for understanding and encouraging saving for the future self.

### “Goals or Means: How Psychological Distance Influences Depletion Effects”

*Kellogg Nidhi Agrawal, University of Hong Kong, China*

*Echo Wen Wan, University of Hong Kong, China*

Consumers often need to exert self-control in multiple activities in succession. Previous research has suggested that self-control relies on self-control resources (Muraven and Baumeister 2000). Performing consecutive self-control is particularly vulnerable to suffer the depletion effect: individuals reduce control on a self-control task after having exerted great self-control on a preceding task (Baumeister et al. 1998). This research examines how temporal perspective affects consecutive self-control (depletion effects) by systematically highlighting either goals or resources.

In the current research we employed the goal-means approach to examine how construal influences depletion effects. Construal level theory (Trope and Liberman 2003) posits that the same event or object can be represented at multiple levels. Higher-level construals (e.g. associated with long-term outcomes) highlight central goals associated with an event, while lower-level construals (e.g. associated with near-term outcomes) highlight means and resources (Liberman and Trope 1998). At higher-level construals, individuals focus on self-relevant goals. Thus, they should show more self-control on the second task when they view this task as important (vs. unimportant) to their goals, regardless of their depletion state. In contrast, at lower-level construals, individuals will focus on resources accessible to the self (e.g., their fatigue) rather than on goals. Thus they will perform poorer on the second task when they are in a depletion (vs. non-depletion) state.

Three experiments examine our proposition in a consumer health context. In all experiments participants performed two consecutive self-control tasks. The first task manipulated initial depletion by having participants process messages about Hepatitis that communicated a high or low self-risk perception. Prior research has suggested that processing high-risk health messages presents a trade-off between long-term benefits and short-term interests (e.g., Agrawal, Menon, and Aaker 2007; Menon et al. 2007) and thus requires self-control. The second task involved processing health messages about a different disease that also require self-control. Construal levels were manipulated between the two tasks.

In Experiment 1 participants first read a Hepatitis message and then worked on a mindset task that manipulated construal levels by thinking about near future versus distant future in a writing task (Fujita et al. 2006; Liberman and Trope 1998). Then participants read an article about dental health describing symptoms, prevention, and treatment of dental diseases. Time spent reading this article served as the measure of self-control. The results show that for participants primed with lower-level construals, those who read a high-risk message spent less time reading about dental health than those who



read a low-risk message. For participants primed with higher construal levels, because dental health is highly relevant to their health goal, participants spent substantial time on reading the dental health article whether they processed a high or low-risk Hepatitis message. The same results pattern emerged on an additional behavior measure of self-control-flossing.

Experiment 2 followed a similar procedure as used in Experiment 1, using a different type of disease in the second task. The importance of this disease to participants' own health goal was manipulated. The results are that participants at lower-level construals exhibited a depletion effect whether the unfamiliar disease was described as important or unimportant. Focus on fatigue mediated this effect. Participants at higher-level construals spent more time reading the disease article when the disease was described as highly relevant to themselves (and thus to their health goal) than when it was described as irrelevant to them, regardless of initial depletion. Participants' perceived higher-level benefit of reading this article mediated this effect.

Experiment 3 employed a similar procedure to that used in Experiment 1, with an additional independent variable: Participants were told that the Hepatitis task was effortful or non-effortful when they finished this task. The results suggest that individuals at higher-versus lower-level construals systematically differ in their reliance on this effort information. While lower level construal use this information to assess their ability, higher level construal interpret the same effort cue in terms of their own goals.

These findings suggest that differences in construal level, due to taking either a short-term or long-term perspective, influence self-control due to inducing assessment of either the self's current resources or the self's longer-term goals.

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