

UC Merced

Proceedings of the Annual Meeting of the Cognitive Science Society

Title

Impatience as Intertemporal Egoism

Permalink

<https://escholarship.org/uc/item/77f7m0wg>

Journal

Proceedings of the Annual Meeting of the Cognitive Science Society, 32(32)

ISSN

1069-7977

Authors

Bartels, Daniel
Urminsky, Oleg

Publication Date

2010

Peer reviewed

Impatience as Intertemporal Egoism

Daniel M. Bartels (bartels@uchicago.edu)

Center for Decision Research, University of Chicago
5807 S. Woodlawn Ave., Chicago, IL 60637 USA

Oleg Urminsky (ourminsk@chicagobooth.edu)

University of Chicago Booth School of Business
5807 S. Woodlawn Ave., Chicago, IL 60637 USA

Abstract

We build on a philosophical account of personal identity (Parfit, 1984) which argues that the degree of concern one has for one's future self may be scaled by the degree of "psychological connectedness"—overlap in properties such as beliefs, values, and ideals—held between one's current and future self. We pose participants with tradeoffs between consuming a benefit in the near future versus consuming more of that benefit in the distant future. When people's sense of connectedness with their future self is reduced, they make impatient choices.

Introduction

Many of the most important and difficult decisions we face in life hinge on the same underlying dilemma: how to choose when trading off consumption or happiness in the immediate future with (more) consumption or happiness delayed to the more distant future. Research on such dilemmas has been broadly defined as concerning choices between one option with higher immediate benefits but lower (or negative) long-term utility and another with lower immediate benefits but higher long-term utility. People's widely documented tendency to prefer smaller rewards sooner over larger rewards later has been characterized as revealing short-sightedness or impatience (Elster, 1979).

In this paper, we focus on a fundamental question raised by the literature on intertemporal choice: why do people's choices often seem so short-sighted or impatient, and why do people differ in their degree of impatience, as inferred from the choices they make? In particular, we will focus on a subset of such dilemmas—intertemporal choices in which the tradeoffs between short and long-term benefits are made explicit—as an ideal setting in which to investigate the decision processes leading to impatience in decision making across a wide range of future-directed thought and behavior. Economists and psychologists have extensively studied how people make these kinds of intertemporal choices, and have offered metrics for judging the degree to which behavior conforms to or diverges from normative and descriptive models.

Much of the work on intertemporal choice has centered on the specific issue of temporal discounting: how people choose between smaller amounts of money or other goods in the immediate future and larger amounts of money or goods to be received at a later date (see Frederick, Loewenstein, and O'Donoghue, 2002 for a detailed review). In this context, the discount rate, the degree to which an outcome loses value by being delayed for a given period of time, can be interpreted as

a measure of impatience (Ainslie 1975). Thus, we can restate the general question of (im)patience in intertemporal choices as asking why people exhibit such *high discount rates* (compared to market interest rates or some other norm) in their behavior and to provide a partial account for why people exhibit such different discount rates from each other.

We will argue that our understanding of what constitutes a reasonable discount rate (or, more generally, prudent vs. impatient choices) has been limited by the implicit assumption that people should maximize the utility of a constant self over one's lifetime. The philosopher Derek Parfit (1984) proposed an alternative view: that a decision about consuming now or later should depend not only on the temporal distance between events, but also on the perceived continuity between one's present and future selves. In this view, the degree of concern one has for one's future self should be scaled by the degree of "psychological connectedness"—overlap in properties such as beliefs, values, and ideals—held between one's current and future self. These properties have been proposed to define the mental ties between selves that comprise identity over time (Lewis, 1983; Perry, 1972).

We employ the notion of psychological connectedness—drawn from a literature in which there is an ongoing debate over its specifically *normative* implications (Parfit, 1984; see Dancy 1997 for dissenting views)—to test a *descriptive* account of people's intertemporal choices. In our view, the greater the perceived connectedness to the future self, the greater people's willingness to defer benefits to the future self, all else equal. Conversely, feeling disconnected from the future self will undercut the general motivation to preserve resources for the future self, causing a reduction in patience that is distinct from other factors that affect valuations of present and future outcomes.

Evidence for high discount rates

In the context of intertemporal choice, impatience (or short-sightedness) is exhibited by consistently choosing sooner-smaller options even when the latter option is more than large enough to compensate for the delay (per some normative standard). Normative models (Koopmans, 1960) indicate that the premium needed in order to forego receiving money sooner rather than later (i.e. the discount rate) should depend primarily on how much interest could be earned on the money in the intervening time, taking into account liquidity constraints and economic factors such as inflation. In contrast,

empirical research has found that actual behavior is generally more impatient than what would be predicted by these views.

Numerous studies have attempted to estimate discount rates, using field and experimental studies, real and hypothetical outcomes, and a range of elicitation methods. Frederick et al. (2002) summarize the literature as characterized by a “predominance of high discount rates—discount rates well above market interest rates.” In addition to experimental studies with hypothetical choices, they review field study evidence for high discount rates (i.e. impatience) in everyday decisions, such as people’s preferences for lower priced appliances with substantially higher long-term usage costs and military employees’ preferences for a large lump-sum payment over an annuity representing a higher than market interest rate.

Heterogeneity in discount rates

Of the research that has shed light on high discount rates, the primary focus has been on moderators of discount rates, both across people and across decision contexts. While generally high, discount rates have been shown to be sensitive to the specific experimental elicitation methods used (e.g. choice, willingness-to-pay, matching, titration of indifference points). Discount rates have been found to exhibit reasonably high test-retest reliability as individual traits (Simpson & Vuchinich, 2000), but vary systematically by demographics (Green et al., 1994) as well as by individual differences in how people think about the long-term implications of their choices (Strathman et al., 1994).

This large literature on interpersonal differences in discounting provides correlational evidence that people often have fundamentally differing discount rates, often in ways that map onto more generalized short-sightedness. However, the behavioral correlates of discounting (e.g. higher discounting among alcohol or drug abusers), in particular, raise questions as to potential confounds and the order of causality.

Connectedness to the future self and discounting

In this paper, we propose that the notion of connectedness to the future self is fundamental for understanding impatience, shedding light on why discount rates are generally high, why some people are more impatient than others, and what kinds of interventions may lead to higher or lower discount rates. In doing so, we draw on the views of philosopher Derek Parfit, who has theorized that changes over time in the psychological properties that comprise one’s identity should warrant a reduction in concern for a later self:

“We care less about our further future... because we know that less of what we are now—less, say, of our present hopes or plans, loves or ideals—will survive into the further future... We may, because of this, act knowingly against our own long-term self-interest... [If] what matters holds to a lesser degree, it cannot be irrational to care less.” (Derek Parfit 1976, p. 99)

In this view, the future self, given an extremely large reduction in connectedness, may be reasoned about almost as a distinct individual. We do not mean to overstate the analogy of regarding the future self as you would regard another—in our account, rather, the future self is seen as a continuation of

the current self, to varying degrees. The future instantiations of the self may be seen as nearly identical to the current self, or they may be substantially different, and we will argue that this perceived degree of continuity leads to differences in patience.

In extending the notion of connectedness to a descriptive account of impatience, we define connectedness between the current self at time t_0 and a future self at time t_1 as the proportion of the defining psychological features of the current self believed to persist in the self that will exist at time t_1 . Consistent with the recent empirical literature on how people judge the continuity of identity over time (Nichols & Bruno, in press; Rips, Blok, & Newman, 2006), connectedness between current and future selves hinges specifically on the stability of one’s defining psychological properties over the time interval.

In our view, a person values future outcomes in proportion to how much she believes that the current self’s important psychological characteristics will persist in the future self. When people feel highly connected to the future self, benefits received by the future self are valued much as if they were received by the present self. However, when a discontinuity in identity is perceived, deferred benefits accrue to a disconnected future self (i.e., a somewhat different person), and this outcome is valued less than having those benefits consumed by the present self. Thus, when people are faced with explicit intertemporal tradeoffs, their allocations of benefits to the future selves are driven, in part, by how psychologically connected they feel to those future selves. As a result, decisions that might appear short-sighted (i.e. characterized by placing a low weight on future consequences or having an inflated discount rate) may instead merely reflect an unwillingness to share resources with a future self who is evaluated to be substantially different from the current self.

A few studies have examined correlations between people’s perception of the continuity of their identity over time and the choices they make. Ersner-Hershfield and colleagues have shown that people who perceive less continuity with the future self show greater devaluation of money (Ersner-Hershfield, Wimmer, & Knutson, 2009; cf. Frederick 2002) and tend to have accrued fewer material assets in their lives (Ersner-Hershfield et al., 2009). Bartels and Rips (2010) investigated the role of connectedness in non-constant discount rates over time and found that declines in a given persons’ discount rates over time—a pattern often referred to as “hyperbolic discounting” (Ainslie, 1975)—correlated with perceived reduction in their own connectedness over time.

In this paper, we provide the first direct, experimental evidence that changes in connectedness to the future self across individuals causes differences in patience for real choices and that the influence of connectedness on patience is distinct from other factors already identified in the literature as impacting people’s relative timing preferences.

Study 1

In Study 1, we investigate the effect of manipulating connectedness on subsequent hypothetical choices between either the immediate receipt of a gift card or a gift card bundled with an additional payment to delay receipt. 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 made a set of hypothetical choices between receiving a gift certificate later in the day, or receiving it in a year along with an additional payment to compensate for the delay. If disconnectedness from the future self is a driver of discounting, then anticipating changes in the properties that comprise one's identity will make people more impatient, and participants exposed to the instability message should require a larger delay premium than participants exposed to the stability message.

Method

One hundred seven undergraduates were approached in a dining hall on campus and agreed to fill out a short survey for a chocolate square. We manipulated connectedness (high vs. low, between subjects) by inducing the belief that the identity of the future self will either change or not change from one's current identity. Specifically, in the high-connectedness condition, participants began by reading a short description of "recent research" suggesting that young adulthood is characterized by stability in identity (e.g., "the important characteristics that make you the person you are right now... are established early in life and fixed by the end of adolescence"). In the low-connectedness condition, participants read about instability (e.g., "the important characteristics that make you the person you are right now... are likely to change radically in young adulthood."). Then, participants wrote a short summary of the passage they read. Data from four participants were dropped from further analysis because they left this response blank or because their paraphrasing indicated misunderstanding or noncompliance.

Next, participants in both conditions were asked to imagine being given a \$120 gift certificate. We used two different retailers, Target and Expedia, to ensure the generalizability of results. They were then asked to make a series of choices between receiving the gift certificate later that day vs. receiving the gift certificate one year later and being paid an extra amount for the delay, using eight dollar values (0, 17, 34, 51, 69, 86, 103, and 120). Participants then answered two kinds of manipulation checks: an assessment of connectedness and a rating of the believability of the passage they had read. To assess connectedness, we asked participants to "think about the important characteristics that make you the person you are now—your personality, temperament, major likes and dislikes, beliefs, values, ambitions, life goals, and ideals and circle the one diagram out of the six below that best reflects your opinion about the degree of connectedness between the person you are now and the person you will be in a year, where no overlap means 'completely different' and complete overlap means 'exactly the same.'" Participants circled one of the six sets of Euler circles representing connectedness, which were coded as numeric scores.

Results and Discussion

Manipulation checks. Participants who read about stability rated themselves as more connected ($M = 4.43$, $SD = 0.73$) than did participants who read about instability ($M = 4.00$, $SD = 1.07$; $t(1,102) = 2.39$, $p < .05$), suggesting that our manipulation was effective in promoting perceptions of one's own identity as more (or less) stable over time and therefore more (or less) connected to one's future self. Believability of the stability and instability passages did not differ ($t < 1$).

Relating perceived (in)stability to discounting. Our measure of patience was the number of deferred options (waiting one year for the gift certificate) chosen out of the eight given, such that larger values indicated greater patience. Participants in the high-connectedness conditions were more patient, requiring a smaller delay premium, on average (\$49, inferred from $M = 5.14$), than did participants in the low-connectedness conditions (\$68, inferred from $M = 4.04$). A 2 (Condition: High/Low Connectedness) x 2 (Good Type: Target/Expedia) ANOVA, finds the expected main effect of Connectedness ($F(1,100) = 9.21$, $p < .01$); neither the effect of good type nor the interaction term reached significance ($F_s < 1$). These results demonstrate both that perceived connectedness to one's future self can be directly manipulated, and, more importantly, that increasing perceived connectedness to the future self increases patience.

Study 2

Study 1 shows that disconnectedness causes impatience, as revealed by the premium people demand to delay receiving an award. Implicit in these choices is that people are depriving their future selves of potential resources, in order to consume sooner. However, it is not necessarily the case that people think of such tradeoffs in terms of allocating resources, and they may instead think in terms of fair rates of return for delay or other factors. In fact, the literature has shown that framing matters in such choices: while people are generally willing to accept compensation to wait to consume, they are much less willing to actually pay to speed up an outcome, due to the pain of paying and other factors (Loewenstein, 1988). We have argued that reduced connectedness impacts preferences due to a reduced willingness to share resources with a future self who is evaluated to be substantially different from the current self. In our view, the effects of connectedness should persist even when it is made explicit to participants that they have to, in effect, deprive their future self of resources in order to consume now, thereby highlighting the future consequences of impatience. In this study, we test whether disconnectedness causes impatience so pronounced that people actually are willing to spend their own money in order to consumer sooner.

The results of Study 1 show that over periods of time where one might reasonably expect meaningful change in the properties that comprise one's identity, providing information that highlights the likelihood of decreased connectedness leads to more impatience. Note, however, that the way in which people's perceived connectedness was manipulated relied on participants in different groups being presented with different information. A potential concern, then, is that participants' choices may have reflected a lay theory about what the appropriate effect of changes in identity on patience should be,

rather than reflecting their true preferences. Study 2 addresses this concern in two ways: (i) we pose participants with a decision involving real economic outcomes, and (ii) we manipulate connectedness while keeping the information content the same across the two conditions.

In this study, we used the inferences that participants reached from a metacognitive cue to manipulate their sense of connectedness to the future self. Specifically, we drew from the work on “accessibility experiences” (Schwarz, 2004) to indirectly manipulate people’s perceptions of the stability of their identity, 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 asked to imagine how difficult it would be to generate two reasons should find the task easy, and therefore have no reason to doubt the stability of their identity. Conversely, participants in the 10 reasons condition should anticipate that the task would be more difficult, and are likely to use this anticipated difficulty as a cue to question the stability of their identity, yielding a feeling of low connectedness.

Method

As part of a larger study, one hundred five graduating seniors filled out an online survey 1-2 weeks before their graduation in return for \$4 and entry into a lottery for which they could receive a real gift certificate.

All participants were presented with a passage that described the effect of college graduation on the stability of one’s identity as mixed. Participants in the high-connectedness condition were then asked to judge (on a 7-point scale) how easily they could generate 2 reasons why their own identity would remain very stable over the next 12 months (i.e., before and after graduation), after reading that most participants were able to generate 2 reasons in a previous study. In the low-connectedness condition, participants judged how easily they could generate 10 such reasons, after reading that most participants previously had been able to generate 10 reasons.

Lastly, they read that they had been entered into a lottery for a gift card. They read:

“The drawing will occur in two weeks, and if your survey is chosen, you will receive a \$95 Amazon.com gift card either in one year, or you can pay to receive it immediately after the drawing is held in two weeks.

What is the maximum amount that you would be willing to pay now to be able to use the \$95 gift card immediately?”

Results and Discussion

Manipulation checks. Participants in the 2 reasons (high-connectedness) condition rated the reason-generation task as relatively easy ($M = 5.28$, $SD = 1.51$) compared to the ratings of the participants in the 10 reasons (low-connectedness) condition ($M = 4.58$, $SD = 1.81$; $t(103) = 2.15$, $p < .05$).

Relating perceived (in)stability to willingness to pay to expedite gift certificate. Participants in the 10 reasons (low-connectedness) condition were willing to pay more to speed up receipt of the gift certificate ($M = \$14.83$, $SD = 15.96$) than were participants in the 2 reasons (high-connectedness) condition ($M = \$9.49$, $SD = 8.99$; $t(103) = 2.16$, $p < .05$). In

other words, participants made to feel disconnected from the future self were significantly more impatient—as in the previous study, they strongly preferred to allocate benefits to their sooner, more connected self over their later, less connected self. Unlike the previous study, making impatient choices did not merely imply being less generous to the future self, but rather required the participants to, in effect, deprive their future self of resources in order to consume sooner, thus highlighting the long term consequences of impatient choices.

Study 3

The studies above provide the first evidence that directly manipulating connectedness systematically affects people’s patience for the outcomes they will receive. Next, we test whether naturally-occurring individual differences in perceived connectedness to the future self relate to individual differences in patience. One goal was to rule out the possibility that the observed effects on impatience could be attributed to highlighting the notion of connectedness for our participants prior to their choices, by extending the findings to more natural contexts in which people might or might not spontaneously reflect on connectedness when making choices. Recall that in the prior studies, we manipulated perceived connectedness and then asked for people’s preferences. In this study, we instead employed a re-contact methodology. In the first stage, we measured connectedness (without manipulating it). Three weeks later, in a separate study, we re-contacted participants and collected preference data followed by measures of other psychological constructs known to affect intertemporal choice.

The second goal of this study was to assess the impact of several other variables that could contribute to possible alternative explanations for our findings. In particular, we assess whether intertemporal preference is affected by connectedness, even when we control for natural variation in several psychological factors, distinct from connectedness, that have been linked to patience in the literature. Furthermore, by simultaneously assessing the relationship of individual differences in connectedness and these alternative psychological factors with patience, we can gauge how large an impact connectedness has on patience relative to the impact of other important psychological factors.

In order to test whether rated connectedness has a unique influence on patience when controlling for other potentially explanatory variables, we included measures of (i) degree of “projection bias”, (ii) future anhedonia, (iii) time perception, (iv) reward responsiveness, and (v) non-planning impulsiveness at the end of the second survey.

Projection bias is a measure that captures whether people believe that specifically their *tastes and preferences* will be different in the future (Loewenstein et al. 2003), which might lead people to consume sooner, rather than later, if they think delayed benefits might not fit the future self’s tastes. “Future anhedonia” refers to an affective forecasting phenomenon where people view both positive and negative outcomes as less extreme the farther into the future these outcomes occur. Viewing both positive outcomes as less extreme when delayed

to the farther future may cause people to consume benefits sooner, when their positive qualities are more intense (Kassam et al., 2008). Time perception has been implicated by Zauberman et al. (2009) as a partial explanation for hyperbolic discounting and for high discount rates in the near future. In this view, the proportion of value retained over a given delay is linearly-related to the *perceived* duration of the delay, rather than the actual duration.

Lastly, people who score high in reward responsiveness (degree of desire induced by a reward; Carver & White, 1994) may be more susceptible to factors that induce impulsivity in discounting tasks, and non-planning impulsiveness (inability to resist temptation; Patton, Stanford, & Barratt, 1995) has been linked to higher discount rates (Hinson, Jameson, and Whitney 2003).

We argue that psychological connectedness predicts intertemporal choice over and above these other contending variables, and it does so even in a context in which the idea of connectedness to the future self is not brought to mind by the study's procedure. So, this study assesses the contribution of connectedness to patience, relative to the influence of several other relevant psychological factors.

Method

Ninety four undergraduates participated in the first round of data collection, 57 of whom agreed to participate in the second round of data collection when re-contacted. Participants in the first survey were paid \$1 for their time, and those who agreed to participate in the second survey participated in exchange for entry into a lottery for a \$50 gift certificate.

First survey. Participants gave three sets of connectedness ratings. First, as in Study 1, they circled the pair of Euler circles that best represented their perceived degree of connectedness. Next, participants were asked to think again about these identity-comprising properties and to rate connectedness on a 0 to 100 scale. Finally, participants were asked to draw a mark on a line to rate their connectedness. The multiple measurement procedures enabled us to limit the impact of elicitation method-specific biases.

Second survey. Approximately three weeks later, we re-contacted our participants, offering them an opportunity to participate in a second round of data collection. They were first presented with a titration task, in which they made real choices between receiving a \$50 gift card for Amazon.com (if their survey was chosen) in a week, when the drawing would be held, or receiving a larger-valued gift card in a year (\$50, 58, 66, 74, 82, 90, 98 or 106). Next, they responded to items which measured (i) projection bias, (ii) future anhedonia, (iii) time perception, (iv) reward responsiveness, and (v) non-planning impulsiveness.

Results and Discussion

We combined the three connectedness ratings (Euler circles, similarity rating, and line scale) into an index of connectedness which yielded high internal reliability ($\alpha = .91$). We used this index, along with the alternative variables, to predict people's discounting, as expressed in their choices of gift certificates.

Our measure of patience is simply the number of deferred, larger rewards chosen. We first correlated patience to each predictor variables individually; then conducted a multiple regression, including all predictor variables simultaneously.

Our index of psychological connectedness in the first survey was significantly correlated with patience for receiving a gift card, as measured three weeks later ($r=.29, p<.05$). In addition, projection had a marginally significant effect ($r=-.24, p<.10$), such that those who anticipated that their tastes would change exhibited less patience. None of the other measures had a significant correlation with patience in the gift card task.

More importantly, connectedness predicts patience in a multiple regression ($\beta=.78, p <.05$) controlling for the other factors which have been shown, in other circumstances, to exert their own influences on patience (but which were not significant in this regression). This finding is particularly striking, given that we measured each construct (connectedness and patience) uncontaminated by the other construct, due to the three week delay between the two measures. Thus, the fact that psychological connectedness remains a significant predictor of patience, even when all of the factors are entered in the regression simultaneously (model $R^2 = .20$), provides strong evidence for both the distinctiveness and pervasiveness of psychological connectedness as an explanation for discounting.

Summary and Conclusions

The three studies described here show that people's beliefs about the stability of the important characteristics that determine their identity over an interval of time also determine the patience they exhibit over that interval. People who perceive relatively less connectedness to their future selves require a larger delay premium to wait for a gift card, pay more to expedite receipt of a gift card, and are more likely to favor smaller-valued gift cards over larger-valued, delayed gift cards than people who feel highly connected to their later selves. Perceived connectedness, in turn, can be influenced by exposure to information regarding the variability of identity-comprising characteristics over time and by the ease with which reasons for expecting stability over time can be generated. We found that both manipulated and measured perceptions of connectedness influence intertemporal choice, even when connectedness is not brought to mind in the testing session. Moreover, in the last study, connectedness was shown to be a unique, and in our data, the strongest predictor of discounting compared to other psychological factors.

Taken together, these results shed light on a heretofore under-represented explanation of discounting, and one that is quite well-grounded theoretically (Parfit, 1984): A powerful determinant of people's future-oriented preferences, plans, and behavior is the person they expect to be when outcomes are realized. When this later person is more closely connected to the current self in terms of sharing important psychological properties, the decision maker is more motivated (consciously or not) to act patiently—that is, in a manner that reflects greater consideration of the later self's welfare.

To our knowledge, the current studies are the first to manipulate perceived connectedness to a later self and the first

to assess the descriptive adequacy of this determinant of discounting against the adequacy of other determinants. It is important to note, however, that temporal discounting is likely to be multiply-determined. There have been several attempts to integrate these multiple determinants in models of discounting (e.g., Killeen, 2009), but because none of the existing models accommodate how inferences about continuity of self over time affect preference, none explicitly account for the effects we have demonstrated. A model designed to capture our effects would need to incorporate a parameter which represents the degree of connectedness, such as the proportion of the defining characteristics of the current self's psychological make-up believed to persist in the future self at future points in time. Discounted utility would then be scaled by this parameter, representing the partiality towards more connected selves which we hypothesize and provide evidence for.

The key intuition of our framework that is absent from other accounts of discounting is that "impatience" can be the result of simply allocating less to a future self that is seen, to varying degrees, as a continuation of the current self. And notably, by our account, allocating less utility to a less connected later self is thus not necessarily a mistake. However, in those contexts where it is a mistake—for example, where people consistently fail to maintain their plans in advance of temptation (e.g., under-saving relative to budgetary allowances)—fostering the sense that what matters most in defining us persists over time may help us persist in achieving important goals, including those that most help us maintain what defines us.

Acknowledgments

Thanks to Gretchen Chapman, Kristin Diehl, Hal Ersner-Hershfield, Shane Frederick, Ryan Hamilton, Reid Hastie, Craig Joseph, Aparna Labroo, Sean Nichols, Pete McGraw, Doug Medin, Greg Murphy, Chris Olivola, Howard Rachlin, Ed Smith, Stephen Spiller, George Wu, and special thanks to Lance Rips for feedback, suggestions, and encouragement regarding this project.

References

Ainslie, G. (1975). Specious reward: A behavioral theory of impulsiveness and impulse control. *Psychological Bulletin*, 82, 463-496.

Bartels, D. M. & Rips, L. J. (2010). Psychological connectedness and intertemporal choice. *Journal of Experimental Psychology: General*, 139, 49-69.

Carver, C. & White, T. (1994). Behavioral inhibition, behavioral activation, and affective responses to impending reward and punishment. *Journal of Personality and Social Psychology*, 67, 319-333.

Dancy, J. (1997). *Reading Parfit*. Oxford: Blackwell

Elster, J. (1979). *Ulysses and the Sirens*. NY: Cambridge U.

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

Ersner-Hershfield, H., Wimmer, G.E., & Knutson, B. (2009). Saving for the future self: neural measures of future self-

continuity predict temporal discounting. *Social Cognitive and Affective Neuroscience*, 4, 85-92.

Frederick, S. (2002). Time preference and personal identity. In *Time and decision: Economic and psychological perspectives on intertemporal choice*, G. Loewenstein, D. Read, & R. Baumeister, Eds. NY: Russell Sage.

Frederick, S., Loewenstein, G., & O'Donoghue, T. (2002). Time discounting and time preference: A critical review. *Journal of Economic Literature*, 40, 351-401.

Green, L., Fry, A., & Myerson, J. (1994). Discounting of delayed rewards: A life-span comparison," *Psychological Science*, 5, 33-36.

Hinson, J., Jameson, T., & Whitney, P. (2003). Impulsive decision making and working memory. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 29, 298-306.

Kassam, K., Gilbert, D., Boston, A., & Wilson, T. (2008). Future anhedonia and time discounting. *Journal of Experimental Social Psychology*, 44, 1533-1537.

Killeen, P.R. (2009). An additive-utility model of delay discounting. *Psychological Review*, 116, 602-619.

Koopmans, T. (1960). Stationary ordinal utility and impatience. *Econometrica*, 28, 87-309.

Laibson, D. (1997). Golden eggs and hyperbolic discounting. *Quarterly Journal of Economics*, 112, 443-477.

Lewis, D. (1983). Survival and identity. In *Philosophical Papers*, Vol. 1, Oxford: Oxford U. Press, 55-77.

Loewenstein, G. (1988). Frames of mind in intertemporal choice. *Management Science*, 34, 200-214.

Loewenstein, G., O'Donoghue, T., & Rabin, M. (2003). Projection bias in predicting future utility. *The Quarterly Journal of Economics*, 118, 1209-1248.

Nichols, S. & Bruno, M. (in press). Intuitions about personal identity: An empirical study. *Philosophical Psychology*.

Parfit, D. (1976). Lewis, Perry and what matters. In *The Identities of persons*, A.O. Rorty, Ed. Berkeley, CA: University of California Press, 91-108.

Parfit, D. (1984). *Reasons and Persons*, Oxford: Oxford U. Press.

Perry, J. (1972). Can the Self Divide? *Journal of Philosophy*, 69, 463-488.

Rips, L.J., Blok, S., & Newman, G. (2006). Tracing the identity of objects. *Psychological Review*, 113, 1-30.

Schwarz, N. (2004). Meta-cognitive experiences in consumer judgment and decision making. *Journal of Consumer Psychology*, 14, 332-348.

Simpson, C. & Vuchinich, R. (2000). Reliability of a measure of temporal discounting. *Psychological Record*, 50, 3-16.

Strathman, A., Gleicher, F., Boninger, D., & Edwards, C. S. (1994). Consideration of future consequences: Weighing immediate and distant outcomes of behavior. *Journal of Personality and Social Psychology*, 66, 742-752.

Zauberman, G., Kim, B.K., Malkoc, S., & Bettman, J. (2009). Discounting time and time discounting: Subjective time perception and intertemporal preferences. *Journal of Marketing Research*, 46, 543-556.