

UC Merced

Proceedings of the Annual Meeting of the Cognitive Science Society

Title

How Awareness and Valuation of the Future Jointly Shape Intertemporal Financial Decisions

Permalink

<https://escholarship.org/uc/item/3vh194w9>

Journal

Proceedings of the Annual Meeting of the Cognitive Science Society, 36(36)

ISSN

1069-7977

Authors

Bartels, Daniel
Urminksy, Oleg
Frederick, Shane

Publication Date

2014

Peer reviewed

How Awareness and Valuation of the Future Jointly Shape Intertemporal Financial Decisions

Daniel M. Bartels (bartels@uchicago.edu)

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

Oleg Urminsky (oleg.urminsky@chicagobooth.edu)

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

Shane Frederick (shane.frederick@yale.edu)

Yale University, 52 Hillhouse Ave. Room 116
New Haven, CT 06511 USA

Abstract

We examine people's preferences about whether to engage in discretionary spending vs. save their money and find that reduced spending in the present requires the combination of both being motivated to provide for one's future self (valuing the future) and actively considering long-term implications of one's choices (awareness of the future). Feeling more connected to the future self—thinking that the important psychological properties that define your current self are preserved in the person you will be in the future—provides the motivation for people to make far-sighted choices by changing the valuation of future outcomes. However, this change only reduces spending when opportunity costs are highlighted.

Keywords: Judgment; Decision Making; Intertemporal Choice; Personal Identity; Consumer Behavior.

Introduction

“If you're wasting \$5 a day on little things like a latte at Starbucks or a muffin, you can become very rich if you can cut back on that, and actually took that money and put it in a savings account at work, like a 401(k) plan or an IRA account... [I]n your 20s, you can actually be a multimillionaire by the time you reach retirement by simply finding your latte factor and paying yourself back.” (Bach, 2002)

The advice above—offered by financial self-help guru David Bach—describes a savings strategy that is not easily followed. Continuous restraint is difficult to achieve: one must take into account the future opportunities that current indulgences displace and must value those future outcomes, even though the benefits enjoyed by future selves come at the cost of current forbearance. Individual differences in these two dispositions (considering and valuing future outcomes) may help explain why people in similar economic circumstances sometimes save at very different rates.

In the current studies, we study how both factors jointly shape spending decisions. We investigate people's awareness of the future consequences of their choices via the degree to which they consider the opportunity costs of their choices. We investigate the valuation of future outcomes via connectedness to the future self, which has been shown to impact time discounting (Bartels & Urminsky, 2011). We think that studying either factor in isolation yields an incomplete account,

missing how these considerations interact to shape intertemporal choices and therefore failing to predict when people exercise restraint in spending. We find that these factors are mutually reinforcing. Our three studies find that valuing future outcomes reduces spending primarily when opportunity costs are considered. These results help account for the dearth of evidence showing a relation between time preference (as measured by elicited discount factors) and saving or restraint in spending.

Valuing future outcomes

Time preferences (i.e., the strength of people's preference to receive outcomes sooner and thereby forego larger outcomes that occur later) have been interpreted as the degree to which the future is valued, and therefore have long been viewed as one of the primary determinants of savings and spending decisions (Frederick, Loewenstein, & O'Donoghue, 2002). While the degree of discounting, the functional form of discount rates, and correlates of discounting have been widely studied, less work has been done on the motivational reasons why people discount the value of future outcomes so steeply, and why some people are less patient than others. Prior work has instead primarily focused on either economic considerations (e.g. liquidity constraints; Meyer, 1976) or perceptual accounts (e.g. subjective time, Zauberman et al., 2009).

One starting point for understanding the underlying motivation is the idea that a person can be construed as a temporal sequence of overlapping, but partly distinct selves (Parfit, 1984), rather than a single identical entity over time. The motivation to sacrifice consumption on behalf of future selves could then depend on how “connected” the current self feels toward those future selves—how much overlap the person perceives with respect to beliefs, values, goals, and other defining features of personal identity. The more one anticipates change in these aspects, the less motivated the person may be to save for the future self who will benefit. Recent work implicates psychological connectedness as a determinant of intertemporal choices. High felt connectedness has been related to impatience in intertemporal choice tasks (Bartels, Kvaran, & Nichols, 2013; Bartels & Rips, 2010; Ersner-Hersfield, Wimmer, & Knutson, 2009).

However, those studies—like most laboratory-based research on time discounting — measured intertemporal preferences using tradeoffs between explicitly specified smaller rewards available sooner and larger rewards available later (e.g., would you rather have \$500 in a week or \$1000 in a year?). Spending decisions, by contrast, are rarely explicitly framed as an intertemporal tradeoff. For example, a person might spend \$4 on a latte at Starbucks without thinking about opportunity costs at all (Frederick et al., 2009), and people may make such decisions without considering the future opportunity costs of the expenditure. This observation may help explain why attempts to use estimates of discounting derived from laboratory tasks to predict “far-sighted” decision making in the field have yielded mixed results (see Urminsky & Zauberman, 2013 for a review).

Awareness of future outcomes

A growing body of literature has shown that increasing the salience of opportunity costs or tradeoffs (we will use the two terms interchangeably) restrains spending. In particular, Frederick et al. (2009) show that merely reminding people that unspent money could be used for other purposes reduced intended spending. While some of the opportunity costs considered may be in the present (e.g., other items in the same store), the opportunity cost of a current purchase could often also be construed as reduced consumption in the future. Furthermore, manipulations that explicitly direct attention to future consequences have been shown to increase preferences for delayed rewards (Hershfield et al., 2011). Likewise, a greater focus on long-term consequences predicts higher (reported) intent to save more money for retirement (Nenkov, Inman, & Hulland, 2008) and higher (reported) incidence of healthy behaviors (Strathman et al., 1994). Individual differences in the propensity for financial planning (e.g., explicit consideration of future spending) predict accumulated wealth, coupon use, and credit score (Lynch et al., 2010).

To date, there has been minimal overlap between research investigating the consideration of future outcomes and research investigating the valuation of future outcomes. Neither the distinction, nor possible interactions are typically discussed. Accounts of decision-making based on this discounting literature then often assume that people vary in their patience, without distinguishing between consideration and valuation of future consequences as determinants of patience.

In contrast, we argue that the consideration of future outcomes and the valuation of those outcomes are not only conceptually distinct, but the nature of the interaction between the two is important for understanding how people make everyday intertemporal choices. To illustrate the distinction, consider two people, Jan and Fran, who both spend all their discretionary income every month on current consumption instead of saving for the future, but for different reasons. Jan spends all her money because she fails to consider her future financial needs. In contrast, Fran spends all her money because, despite being aware of the consequences, she doesn't care about what happens to her when she's old.

In this paper, we investigate the unaddressed question of whether and how these two factors interact in shaping people's spending decisions. The current studies offer insights into why financial outcomes have not been consistently predicted by measures of discounting in the prior literature by finding evidence that awareness of and valuation of the future interact to predict people's choices.

Study 1

Study 1 examines how the recognition of tradeoffs inherent in choices and how valuation of the future (which increases with greater connectedness to the future self) jointly determine financial decisions. Any single contemplated expenditure, by itself, rarely jeopardizes any other specific spending or savings goals and, thus, may often be made without considering opportunity costs. However, the notion of opportunity cost can be readily cued, and we predict that recognizing the tradeoffs inherent in choice will potentiate the relation between connectedness and thrift.

Method

We collected 137 complete surveys from adult online participants who were considering buying an iPad. We crossed an opportunity cost manipulation used by Frederick et al. (2009) with a psychological connectedness manipulation used by Bartels and Urminsky (2011), which induces the belief that one's identity will (or will not) substantially change. Specifically, participants in the high connectedness condition ($N = 69$) began by reading a short description of recent research suggesting that 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”). Participants in the low-connectedness condition ($N = 68$) read about instability (e.g., “the important characteristics that make you the person you are right now... are likely to change radically, even over the course of a few months...”). Participants then rated their felt connectedness to the future self—the degree to which they felt that the important psychological properties that define their current selves would be preserved in their future selves—on a 100 point scale, and on a corresponding visual analog scale utilizing Euler circles with varying degrees of overlap. These two measures were substantially correlated ($r = 0.73$), and we used the average as our measure of connectedness. The manipulation influenced rated connectedness as intended ($M = 77.1$, $SD = 16.3$ in the high condition vs. $M = 62.8$, $SD = 19.5$ in the low condition; $t(135) = 4.68$, $p < .01$).

Participants were then presented with the choice below. The \$100 price difference between the two products was left implicit in the control condition ($N = 67$), but stated explicitly for participants in the “salient opportunity cost” condition ($N = 70$):

Imagine that you have been saving some extra money on the side to make some purchases, and that you are faced with the following choice. Select the option you would prefer.

- (A) Buy a 64 Gigabyte Apple iPad for \$735
- (B) Buy a 32 Gigabyte Apple iPad for \$635 [leaving you \$100 for other purposes]
- (C) Not buy either iPad

Results and Discussion

In the high connectedness condition, adding the opportunity cost reminder decreased the choice share of the premium iPad, from 35% to 6% ($\chi^2 = 9.3, p < .05$) but had no such effect in the low connectedness condition (27% vs. 23%, *n.s.*). The difference in connectedness only reduced choices of the premium product when opportunity costs were cued (23% vs. 6%, $\chi^2 = 4.2, p < .05$), but not when the cue was absent (27% vs. 35%, *n.s.*).

We also coded the spending level of the chosen option (\$0, \$635, or \$735) and regressed this measure on connectedness, opportunity cost cue, and their interaction. Here, we find the predicted interaction ($\beta = -59.97, t = -2.10, p < .05$) and no main effects (β s = -12.10 and -22.32, *ts* < 1 for Connectedness and Opportunity Cost Cue; See Figure 1), suggesting that exercising financial restraint requires both high degrees of connectedness to one's future self and a reminder to consider opportunity costs of current expenditures.

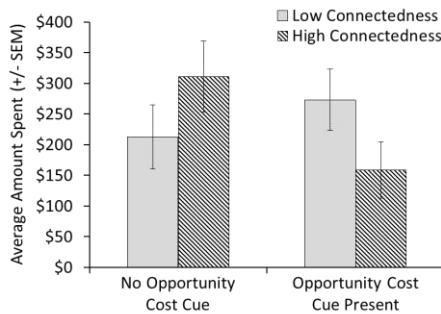


Figure 1: Amount spent by whether or not opportunity costs were cued and by low/high connectedness condition

Study 2

In Study 1, we manipulated the salience of opportunity costs, but some people may not require such prompts. Spiller (2011) found that people with greater propensity to plan for the future (a scale introduced by Lynch et al., 2010) are more likely to spontaneously recognize opportunity costs. We predict that connectedness to the future self should be a stronger predictor of discretionary purchasing among those with greater propensity to plan, much as we predict it to be when opportunity costs are experimentally cued.

Method

One hundred ninety-nine adults completed an online survey where respondents chose whether to spend \$14.99 on a hypothetical DVD, and we manipulated the salience of the expenditure's opportunity cost by including or excluding the reminder in brackets below:

Imagine that you have been saving some extra money on the side to make some purchases, and on your most recent

visit to the video store, you come across a special sale on a new DVD. This DVD is one with your favorite actor or actress, and your favorite type of movie (e.g., comedy, drama, thriller, etc.). This particular DVD that you are considering is one that you have been thinking about buying for a long time. It is available at a special sale price of \$14.99.

What would you do in this situation?

(A) Buy this entertaining DVD

(B) Not buy this entertaining DVD [keeping the \$14.99 for other purposes]

Participants also rated their felt connectedness to the future self as in Study 1 and then completed the "Consideration of Future Consequences" scale (Strathman et al. 1994) and the "Propensity to Plan for Money" scale (Lynch et al. 2010) adapted to a one-year time frame.

Results and Discussion

The opportunity cost manipulation reduced intended purchase rates from 63% to 49% ($\chi^2 = 4.1; p < .05$). A spotlight analysis based on a fitted logistic regression model showed that the opportunity cost cue was especially effective for people with connectedness scores one-standard deviation above the mean (for whom the opportunity cost reminder decreased purchase rates from 58% to 28%). Conversely, among those whose connectedness scores were one standard deviation below the mean, the manipulation had no effect (68% vs. 72%).

We also analyzed two measures of spontaneous consideration of opportunity costs. The consideration of future consequences scale and the propensity to plan scale correlated strongly with each other ($r = .53$). Both measures also correlated significantly—though not especially strongly—with connectedness to the future self (r s = .18 and .22, p s < .01).

Overall, purchase intent was negatively correlated with connectedness, propensity to plan, and consideration of future consequences (biserial correlations: r s $\leq .19, p$ s < .05). However, higher connectedness related to lower purchase intent when opportunity costs were highlighted ($r(97) = -.42, p < .01$), but not in the control condition ($r(102) = -.09, p > .10$). The difference between correlations is significant ($z = -2.48, p < .01$).

Not surprisingly, when opportunity costs were experimentally highlighted, the spontaneous propensity to plan became a directionally weaker predictor of purchase intent ($r = -.31$ vs. $-.09, p = .10$), as did consideration of future consequences ($r = -.24$ vs. $-.12, n.s.$). In short, psychological connectedness to the future self has a greater effect on purchase decisions when tradeoffs are highlighted, and highlighting tradeoffs reduces the significance of individual differences in the spontaneous tendency to do so.

To model the combined effects of these factors, we jointly regressed respondents' purchase decision on opportunity cost cue, connectedness, propensity to plan and the interactions between these variables. All of the predictor variables except for connectedness and all pairwise interactions were significant. More importantly, the three-way interaction was significant (all p s < .01), indicating that measured propensity to plan moderated the interaction of connectedness and opportunity

cue reminder. The full details of the logistic regression are given in the table below. (We find similar results when we replace propensity to plan with consideration of future consequences but omit this analysis due to space constraints.)

Source	β	SE	Wald	p
Constant	.633	.203	9.70	.002
Connectedness	-.232	.226	1.05	.305
Opportunity Cost Cue	-.673	.203	10.99	.001
Propensity to Plan (PTP)	-.741	.242	9.41	.002
Cue x Connectedness	-.795	.248	10.27	.001
Cue x PTP	.750	.242	9.64	.002
Cue x Connectedness x PTP	.917	.248	13.67	.000

These findings have implications for understanding the efficacy of behavioral interventions that remind people of the future consequences of their actions (e.g., that buying a latte means spending down one's retirement account). Such interventions are likely to be less effective for those who don't identify strongly with their future selves (and may therefore steeply discount the value of future outcomes) and are likely to be redundant for people who already spontaneously construe choices in terms of opportunity costs.

Study 3

So far, our results suggest that people who think of choices as affecting future selves they care for will make more farsighted choices—foregoing the impulse to purchase goods they covet but can sensibly forego. One interpretation of these findings is that the combination of connectedness to the future self and opportunity cost salience merely makes people less willing to spend in the present and therefore more likely to reject any purchase.

Alternatively, those more connected people who are aware of opportunity costs may be more likely to trade off the consumption value of the product on offer against the long-term utility of not spending (e.g., the value of money in the bank), resulting in spending that is more focused on what the person values most highly. If this is the case, a greater reduction in spending will be concentrated among products that provide low value to the person. To test this, in the following study we examine which purchases are most affected by our connectedness and opportunity cost manipulations. We also extend our results by using a common task (considering the relative desirability of multiple product categories before shopping) to manipulate the salience of tradeoffs.

Method

We collected 130 complete surveys from online participants. We crossed a connectedness manipulation with a tradeoff salience manipulation. The procedure consisted of three stages: First, we manipulated connectedness by randomly assigning respondents to estimate the difficulty of generating 10 [2] reasons why their own identity would remain very stable over the next year, after reading that most participants in a previous study could do so (see Bartels & Urminsky, 2011). We expected that participants considering two reasons would find the task easy, and therefore have no reason to doubt the stability of their identity. In contrast, those considering ten reasons

would anticipate difficulty generating the reasons, and would therefore interpret this experience as evidence of lower connectedness to their future selves.

In the final two stages, participants completed two tasks: (i) ranking the desirability of six product categories (pocket video cameras, blenders, bed sheets, pocket watches, laser printers, and nonstick frying pans) from 1 = "Most desirable; the kind of product I want the most" to 6 = "Least desirable; the kind of product I want the least", and (ii) choosing between a more and less expensive product from each of those categories.

In the high tradeoff salience condition, the ranking task preceded the decision of which product to purchase. The ranking task was intended to make tradeoffs between different priorities more salient, encouraging recognition that satisfying one purchase goal subordinates others. At a minimum, the task makes participants contemplate at least five other uses of their money before their first decision of whether to splurge or save. In the low tradeoff salience condition, the same ranking task was completed after making the choices.

We expected the connectedness manipulation to have the strongest effect when tradeoffs were highlighted by the ranking task. Our analyses focused on how often, and under which conditions, participants "splurged" by buying the more expensive product in each of the six categories. This design also allows us to examine how closely that choice relates to the ranked desirability of the product category, testing whether the combination of high connectedness and high tradeoff salience motivate thrift across the board, or whether knowing and caring about future outcomes causes people to reduce spending for less-valued categories.

Results and Discussion

Number of expensive purchases. As predicted, people forced to consider tradeoffs (by initially ranking the categories) chose fewer premium products when made to feel more connected (1.45 vs. 2.36, $t = 3.08$, $p < .01$), but connectedness had no effect when the ranking task came second (2.19 vs. 2.03, *n.s.*). A linear regression confirmed that the predicted interaction was significant ($\beta = -.27$, $t = -2.38$, $p < .05$), but found no effect of tradeoff salience and a marginal main effect of connectedness. Analyzing the amount spent yields a similar result: when tradeoffs are cued, higher connectedness yields lower spending (\$489 vs. \$503, $t = 2.99$, $p < .01$) but otherwise has no effect (\$500 vs. \$498). A linear regression predicting total intended spend confirms the significant interaction ($\beta = -3.78$, $t = -2.16$, $p < .05$) and finds a marginal main effect of connectedness and no effect of opportunity cost.

Price Sensitivity. Participants ranked the six categories, from most to least preferred. For each participant, we computed the correlation between the rank assigned to that category of product (1 through 6) and their decision to purchase the more expensive item within the category. Across all conditions, the average within-subjects correlation was significantly less than zero (average $r = -.12$, $t = -3.64$, $p < .001$)—respondents were less likely to splurge for categories they cared less about. Fur-

ther probing reveals that higher (vs. lower) connectedness yields fewer choices of the premium option in the less preferred categories (average $r = -.25$ vs. $.06$, $t(64) = 3.40$, $p = .001$) when tradeoffs are highlighted, but not when they are not highlighted (average $r = -.15$ vs. $.09$, $n.s.$).

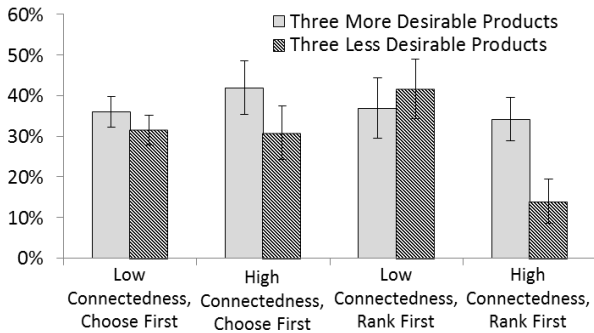


Figure 2: Probability of buying more expensive item in pair by (i) whether or not opportunity costs were cued, (ii) low/high connectedness condition, and (iii) whether the items were ranked as relatively more/less desirable by participants

These results suggest that among participants who were made to feel more connected to the future self, the tendency to splurge was not only reduced, but spending was more concentrated in the most personally important product categories, which was especially pronounced in the high tradeoff salience conditions (i.e. when people ranked categories before choosing). To illustrate, Figure 2 presents the fraction of times respondents chose to splurge in the higher ranked (top 3) vs. lower ranked (bottom 3) product categories. As predicted, only those in the high connectedness- high tradeoff salience condition had fewer choices of the premium product for the lower-ranked (vs. higher ranked) categories ($M = .14$, $SD = .21$ vs. $M = .34$, $SD = .29$, $t(37) = 3.73$, $p < .001$). No such difference was observed in the other conditions (all $ps > .10$). Thus, it is specifically when opportunity cost is highlighted and connectedness is heightened, that people reduce spending, specifically on less desirable products (relative to all other conditions).

This study generalizes our findings to a more typical purchase situation. A task that people often do before shopping—prioritizing categories of spending—can highlight tradeoffs, and this facilitates the effect of connectedness on fiscal restraint. Furthermore, the restrained spending occurs for purchases of product categories that are less personally desirable. As a result, higher-connectedness respondents’ tastes for spending are both reduced and more focused after completing the ranking task.

General Discussion

The general framework of decision making advanced in this paper recognizes two factors that jointly determine choices: (i) valuation of one’s future interests (which is partially determined by connectedness) and (ii) awareness of the intertemporal tradeoffs entailed by current choices. These key factors have been studied before, but in isolation, and examin-

ing them together yields insights that are not apparent when either is studied alone.

We find that the awareness of opportunity costs is insufficient to motivate fiscal restraint among people low in connectedness, who place lower value on future outcomes, and therefore may be least prone to save. We also find that the motivation to provide for future selves is insufficient to motivate thrift when opportunity costs are not highlighted.

The efficacy of making tradeoffs salient for promoting thrift could depend on the specific opportunity costs highlighted. We would expect connectedness (via its influence on temporal discounting) to matter more if the opportunity costs were characterized as future consumption. Since our opportunity cost reminders were generic and not specifically about future opportunities displaced by current indulgences, our studies may be a conservative test of the interaction we posit.

Implications for interventions in financial decision making

The large literature on financial decision making has explored various interventions aimed at promoting far-sighted behavior. Many interventions target people’s presumed lack of information to optimize such decisions. For example, credit card companies are required to disclose the monthly payment needed to pay off one’s accumulated debt in three years, cigarette packaging requirements mandate explicit warnings of the long-term health consequences of smoking, and New York requires chain restaurants to post calorie information.

Related interventions assume that people may fail to fully process information or fail to summon it at the right time. For example, studies have found increased savings or reduced debt from interventions like reminding people of the consequences of failing to save (e.g., Koehler et al., 2011). Presumably this affects behavior by bolstering the accessibility of intertemporal tradeoffs in the face of competing cognitive demands. Other interventions, such as surveys about banking and savings (Dholakia & Morwitz, 2002), or collecting deposits in person (Ashraf, Karlan, & Yin, 2006) may provide inadvertent reminders, with similar effects.

However, informational interventions have not always been found to be effective. The current studies suggest that these kinds of interventions can fail to have an impact either because such tradeoffs are spontaneously taken into account (a person may have a high propensity to plan) or because people have low connectedness with the future selves their current forbearance would benefit. Thus, efficacy of interventions will vary markedly across people, for reasons unrelated to the intervention’s potential benefit. Our analysis suggests that connectedness-increasing interventions may therefore increase the efficacy of informational manipulations. However, not all informational interventions will necessarily have such positive synergies: for example, an ad which emphasizes the costliness of medicating our frail older selves could well undermine the feelings of connectedness that provides our motivation to save for those older selves in the first place.

If intertemporal preferences are stable, our results are consistent with the characterization of informational interventions

as “nudges”, which affect the choices of those who want to make far-sighted choices but not those of people who have a preference for current consumption. However, recent research on connectedness suggests that intertemporal choices may not represent stable preferences, and therefore bolstering people’s sense of connectedness with their future self could also be seen as an alternative type of intervention (Bartels & Urminsky, 2011) that acts on underlying preferences. Interventions that involve imagining one’s future self (e.g. “motivational interviewing” used in smoking and alcohol reduction: Colby et al., 2005), or more literally, viewing one’s aged self (Hershfield et al. 2011) may be operating through a similar mechanism. However, these types of interventions, as well as attempts to directly impact time preference (e.g., Urminsky & Kivetz, 2011), will primarily affect decisions for which the tradeoffs are explicit or spontaneously considered. When a non-planner passes by Starbucks, merely shifting her relative valuation of present versus future consumption is unlikely to impact her coffee purchasing, unless she happens to view that purchase in terms of a tradeoff—unless she finds her “latte factor,” as David Bach describes it.

The current studies suggest that greater attention should be placed on the interaction between the factors underlying intertemporal cognition and behavior. Interventions which succeed in both facilitating the recognition of tradeoffs and fostering feelings of connectedness will best promote the interests of people’s future selves. Prudence may require the convergence of specific thoughts and specific feelings at the moment of decision: an explicit consideration of the costs of an indulgence, and empathy for those future selves who bear those costs. Once we recognize and identify with the future beneficiaries of our sacrifices, fiscal restraint may feel more like buying ourselves a future gift and less like self-deprivation.

Acknowledgments

We thank Eugene Caruso, Pete McGraw, Stephen Spiller, and Rob St. Louis for helpful comments, the 2013 Chicago Blackhawks for winning the Stanley Cup, and Jarrett Fowler for superogatory research assistance.

References

Ashraf, N., Karlan, D., Yin, W. (2006). Tying Odysseus to the mast: Evidence from a commitment savings product in the Philippines. *Quarterly Journal of Economics*, 121, 635-72.

Bach, D. (2002). Interview with Fredericka Whitfield, Anchor of CNN Sunday Morning, CNN, Aired December 29, 2002 - 11:23 A.M. EST.

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

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

Bartels, D.M., Kvaran, T., & Nichols, S. (2013). Selfless giving. *Cognition*, 129, 392-403.

Colby, S.M., Monti, P.M., O’Leary Tevyaw, T., Barnett, N.P., Spirito, A., Rohsenow, D.J., Riggs, S., & Lewander, W. (2005). Brief motivational intervention for adolescent smokers in medical settings. *Addictive Behaviors*, 30, 865–874

Dholakia, U.M. & Morwitz, V.G. (2002). “The scope and persistence of mere-measurement effects: Evidence from a field study of customer satisfaction measurement. *Journal of Consumer Research*, 29, 159-167.

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

Frederick, S., Novemsky, N., Wang, J., Dhar, R., & Nowlis, S. (2009). Opportunity cost neglect. *Journal of Consumer Research*, 36, 553-561.

Hershfield, H.E., Goldstein, D.G., Sharpe, W.F., Fox, J., Yeykelis, L., Carstensen, L.L., & Bailenson, J.N. (2011). Increasing saving behavior through age-progressed renderings of the future self. *Journal of Marketing Research*, 48, S23-S37.

Koehler, D., White, R., & John, L. (2011). The price of good intentions. *Social Psychological and Personality Science*, 2, 90-96.

Lynch, J.G., Netemeyer, R.G., Spiller, S.A., & Zammit, A. (2010). A generalizable scale of propensity to plan: The long and the short of planning for time and for money. *Journal of Consumer Research*, 37, 108-128.

Meyer, R.F. (1976). Preferences over time. In R. Keeney & H. Raiffa (Eds.) *Decisions with Multiple Objectives*, pp. 473-89. New York: Wiley.

Neukov, G.Y., Inman, J., & Hulland, J. (2008). Considering the future: The conceptualization and measurement of elaboration on potential outcomes. *Journal of Consumer Research*, 35, 126.

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

Spiller, S.A. (2011). Opportunity cost consideration. *Journal of Consumer Research*, 38, 595-610.

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

Urminsky, O. & Kivetz, R. (2011). Scope insensitivity and the “mere token” effect. *Journal of Marketing Research*, 48,282–295.

Urminsky, O. & Zauberan, G. (2013). The psychology of intertemporal preferences. Working paper.

Zauberan, G., Kim, B.K., Malkoc, S., & Bettman, J.R. (2009). Discounting time and time discounting: Subjective time perception and intertemporal preferences. *Journal of Marketing Research*, 46, 543–56.