When I’M 64: Temporal Referencing and Discount Rates

Shane Frederick, Massachusetts Institute of Technology
Daniel Read, London School of Economics, UK
Robyn LeBoeuf, University of Florida

We examine the effect of “temporal referencing” on discount rates. We show that respondents exhibit much lower discount rates when the timing of a future reward is indexed by the corresponding age (“when you are 47”) than when it is indexed by the length of the intervening time period (“in 10 years”). This framing effect is shown to be especially large among younger people and to gradually diminish with age. We discuss the implications for the marketing of financial instruments.

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SYMPOSIA SUMMARY
Temporal Consumption: How Time Influences our Memories of the Past, our Enjoyment of the Present, and our Preference for the Future
Leif Nelson, University of California, San Diego, USA

SESSION OVERVIEW
Consumption is necessarily temporal in nature. We recall yesterday’s trip to the record store, savor the experience of listening to music today, and look forward to hearing it again tomorrow. These processes are relatively easy to identify and yet incredibly challenging to describe. Consumers maintain a complicated relationship with time; our consumption memories are colored by our motives over time, our behavior and our experience changes with the progression of time, and in fact our anticipation of the future is sculpted by our ability to conceptualize time. In four papers, we pose questions and offer some tentative answers, about the role of time in consumption.

The first paper (Norton and Chance) considers how consumers recall past decisions. Quite famously, past research has suggested that following difficult decisions people are motivated to bolster the chosen option and deride the foregone alternatives (i.e., Festinger 1957). Norton and Chance show that consumers sometimes use the even simpler strategy of forgetting the original decision entirely. They demonstrate first that, in seeming violation of standard memory effects, this decision amnesia is most likely to occur for those decisions consumers spent the most time considering. Furthermore, consumers seem to fill in the missing elements of past decisions with originally absent options: The desire to maintain the amnesia is strong enough to reconstruct the fabric of memory. Though people know how to cope with post-decision regret, sometime a few well-chosen memory lapses may be even more efficient.

When given enough time, people may avoid such regrets by simply improving their consumption. The second paper (Vohs) considers self-regulation over long time periods, and show that the seasoned veterans of self-control (of the consumption of calories and the expression of emotions) are significantly better at foregoing temptations than their journemen counterparts. Most interesting were results suggesting that a little bit of self-regulatory experience was worse than none at all, as novice dieters showed less self-control than non-dieters. In order to perfect consumption, people need to self-regulate, but it appears that people need a lot of time practicing self-regulation before they can eliminate its negative consequences.

What about the perception of time during consumption? Intuitively and empirically it is believed that time flies when you’re having fun. The presence of such a strong lay theory, and the persistent ability for people to misattribute information to the wrong source, allows for an intriguing possibility: if people think that time is flying, to they actually have more fun? The third paper (Nelson and Meyvis) shows that people think an upcoming event will be more enjoyable if they are made to feel as though it will go by quickly. Furthermore, in three additional studies they also show that when an incidental cues signals that time is passing quickly (a slightly fast timer) people enjoy listening to music more, regardless of whether the songs are enjoyable or irritating.

The final paper considers how we value products and currency to be consumed in the distant future (Frederick, Read, and LeBoeuf). A commodity to be consumed “when I’m 64” is no different than one to be consumed “33 years from now”, put people value the former much more than the latter. Interestingly, that effect diminishes with the age of the participant, perhaps reflecting that experience with time makes consumers more expert at conceptualizing it. Furthermore, another investigation hints that the key variable may be thinking about age, rather than merely focusing on dates and time.

Given the breadth of this research domain, these papers necessarily represent substantial variation in both methods and inferences. Thankfully, we are pleased to have an expert in temporal perception to serve as a discussant for the session. Over his career Yaacov Trope has made substantial inroads into the investigation of time in human behavior, and his work on temporal construal has brought coherence to a seemingly diverse set of findings.

EXTENDED ABSTRACTS

“Decision Amnesia: Why Taking Your Time Leads to Forgetting”
Michael I. Norton, Harvard University
Zoë Chance, Harvard University

Imagine having to choose between your two favorite flavors of ice cream, chocolate and mint chip. Such conflicted decisions – decisions under uncertainty – have been explored through a number of theoretical lenses: cognitive dissonance theory (Festinger, 1957) focuses on how people derogate foregone options and inflate the value of their choices – which a host of studies have demonstrated – while other researchers have focused on how such decisions lead to counterfactual regret (e.g., Kahneman & Miller, 1986; Roese, 1997). To varying degrees, these approaches focus on how individuals engage in the uncomfortable process of rationalizing the regret such decisions induce. Our research demonstrates another viable, efficient – and, we suggest, surprisingly common – means of coping with difficult choices: forgetting them altogether. Rather than engage in complicated – and costly – post-decisional rationalization, we suggest that individuals frequently exhibit decision amnesia when coping with difficult decisions. In addition, because the motivation to forget is at its highest when decisions are most difficult, we predict that people are ironically most likely to forget those decisions they take the longest to make, since this greater amount of time indicates a greater degree of conflict.

We demonstrate this decision amnesia in a series of studies using a diverse array of stimuli. In Study 1, we asked participants which vacation destinations they preferred among 40 pairs (e.g., Shanghai vs. The French Riviera), while measuring their reaction time and reported difficulty; after a distracter task, we then asked them to recall which destination they had chosen. As predicted, participants made significantly more errors on pairs they had taken longest to choose between (which were also those pairs they rated most difficult). We replicated this basic effect in choices between types of death (e.g., getting bitten by a poisonous snake vs. getting strangled by a tetherball rope) as well as in choices between consumer products (e.g., an autographed James Gandolfini portrait vs. a Robosapien robot). An alternative explanation for our findings would be that the objective similarity of options – rather than the subjective difficulty of choosing – impairs recall. In Study 2, therefore, participants chose between pairs of colors and we asked them to rate both the difficulty of the choice and the similarity of the two colors. When asked to recall their choices, once again, partici-
pants forgot more difficult than easy choices; most importantly, difficulty predicted accuracy independent of and more strongly than similarity.

The strongest test of our decision amnesia hypothesis, however, is that participants forget not only which option they chose when making difficult decisions, but also forget having made a choice at all. In Study 3, participants again chose between pairs of colors at Time 1. At Time 2, however, rather than indicating the color they chose at Time 1, participants were asked to indicate if they had seen pairs of colors in the previous task or not – and were presented with pairs that had been difficult or easy, or with new pairs they had not seen. As predicted, participants were more likely to forget having seen pairs of colors for which their choice had been difficult than easy. In Study 4, we added a “lure” option at Time 2 (a 3rd color not present at Time 1). When asked to recall the earlier colors, participants were more likely to select the new “lure” option as having been present at Time 1 for pairs that had been difficult, again suggesting they had forgotten the original choice sets altogether.

Taken together, these studies demonstrate that decision difficulty impairs memory both of what options were chosen and even of having made a decision at all: the longer participants took to make decisions – and therefore the longer they were exposed to stimuli – the less likely they were to remember ever having seen them. Of course, in many real life situations, we have lingering evidence of our difficult choices: for instance, we are unlikely to forget which person we married, no matter how hard that decision may have been. There are, however, ample opportunities for decision amnesia to occur; indeed, were we to rationalize every decision we made, we would likely have little time left to think about anything else. Thus decision amnesia may be a generally efficient strategy: rather than continually coping with the agony of regret, we suggest that people simply forget.

“Self-Regulation Over Long Periods of Time: Practicing a Controlled Activity Reduces Depletion of Self-Regulatory Resources”

Kathleen D. Vohs, University of Minnesota

It is now well-known that when people engage in self-regulation something akin to a reservoir of energy becomes depleted and leaves people less capable of performing a subsequent act of self-control. Tests from all around the world as documented in over 90 published articles support this limited-resource model of self-control. Despite these robust findings, it deserves noting that almost all of the experiments are conducted in laboratory settings wherein participants are instructed to engage in a self-regulatory task or they are instructed to engage in a task that is similar in scope but not in degree to which self-regulation is needed. Hence, people in the regulatory condition are presumably engaging in a task that represents some natural form of self-control (e.g., controlling one’s attention while distracting words appear on the video that one supposed to be watching is similar to keeping one’s eyes on a boring speaker while one’s Blackberry begs for attention). Nonetheless, to understand the fundamental nature of self-control, it is crucial for the field to move beyond its current paradigm. Hence, the present research asked whether people who have been self-regulating over long periods of time show differential effects in terms of self-regulatory depletion than people who have not been devoting effort at such lengths of time.

In experiment 1, participants were experienced dieters or novice dieters who came to the lab and were seated at a chair next to or far away from several bowls of tempting candies. The candies were present to differentially activate self-regulatory processes within dieters, who would have to overcome their desire to eat them: sitting close to the candies was designed to be more tempting – and therefore require more self-regulatory resources to resist – than would sitting far away from the candies. Participants sat next to the candies while watching a boring documentary about the lives of Big Horn Sheep. Next, as a test of how many self-regulatory resources they had exerted in the movie-watching phase, all participants were taken to a different room and asked to eat ice cream ostensibly as part of a taste and rate paradigm. Ad-hoc eating was the measure of self-control, a measure that has been used in the eating literature for more than 30 years (Schachter et al 1968). As expected, veteran dieters self-regulated better, by eating less ice cream, as compared to novice dieters. This finding suggests that time spent dieting is a significant factor in how depleting it is to self-regulate.

In Experiment 2, participants were novice dieters, experienced dieters, or non-dieters. They came to the lab where they were tempted with bowls of sugary and chocolate candies. This setting was intended to active the desire to eat, which for dieters would have to be overridden but not so for non-dieters who are not regulating with respect to eating (cf. Vohs and Heatherton 2000). The second task involved asking all participants to attempt to solve difficult puzzles (that were, in actuality, unsolvable), as a measure of self-control. The results showed that non-dieters had the best persistence, followed by the experienced dieters, with the novice dieters showing the worst persistence. These results supported the hypothesis that practicing a specific act of self-regulation over a long period of time fails to disable people to the extent that being new at an act of self-regulation does. Note, however, that being an experienced self-regulator completely removes the need to regulate — dieters who were experienced at dieting were more depleted (and less persistent) than non-dieters, who did not have to regulate while seated next to candy.

In Experiment 3, I investigated long-term efforts at self-regulating in the domain of emotion regulation. All participants completed an emotion regulation questionnaire (Gross and John 2003), which enabled me to score some participants as being experienced emotion regulators (meaning, they were frequently engaging in emotion control) and some participants to be novices at this task (meaning, they did not often control their emotions). All participants were asked to watch a disgusting and sad video under instructions to control their emotions. Later, as a test of self-regulatory resource availability, participants were given a task to perform, which was akin to the task of assembling a bookshelf that was purchased in disassembled form. Persistence at the difficult task was the measure of self-regulation. The results showed that participants who were well-practiced at controlling their emotions were better at persisting at the difficult task relative to participants who were unused to controlling their emotions.

In sum, time spent self-regulating is a meaningful component not yet recognized by current theories in self-regulation, especially work pertaining to the limited-resource model. The discussion of these experiments will revolve around conscious versus nonconscious self-regulation and how repeated attempts at self-regulating may help automatized controlled behaviors and hence free consumers to engage in other acts of self-control.

“Time is Flying, We Must be Having Fun: The Effect of Subjective Time Progression on Enjoyment”

Leif D. Nelson, New York University
Tom Meyvis, New York University

Time flies when you’re having fun. This old adage holds that as enjoyment increases, our estimates of elapsed time will similarly decrease. Indeed, popular wisdom holds up relatively well to empirical scrutiny, as more engaging activities are judged to be faster than similar non-engaging tasks (Chaston and Kingstone...
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2004). Apparently, this basic relationship is strong enough to end up in the popular lexicon.

If the assumed effect of enjoyment on time perception is learned well enough, then perhaps people will rely on this lay belief to infer the cause from the consequence: Subjective changes in the passage of time could lead to corresponding changes in the enjoyment of an experience. Time is flying, I must be having fun.

There is a long history investigating the misattribution of feelings in consumer research (Schwarz, 2004). Feelings of fluency, for example, can make preferences and attitudes feel more positive and more persuasive (Muthukrishnan and Wathieu 2007; Levav and Fitzsimons 2006). Furthermore, existing lay theories (like beliefs about the relationship between time and fun) can influence a variety of human inferences, including those relating to consumption (e.g., Mukhopadhyay and Johar 2005). Given that people have a strong lay theory about the effect of enjoyment on time perception, altering the subjective time experience may lead to inferences of enjoyment. To test this hypothesis, we conducted four studies in which we manipulated the subjective experience of time and measured anticipated (Study 1) or actual (Studies 2-4) enjoyment.

In Study 1, participants thought about the upcoming weekend and listed a few activities they would engage in during that weekend. Some participants listed 2 activities whereas others listed 6. Past research has shown that, when considering future time periods, if people list more events they will perceive the time period to be shorter (LeBoeuf & Simmons 2006). We reasoned that if a known time period (a weekend) was felt to be shorter, people would feel as though the time was moving faster. As predicted, people who listed 6 activities thought the weekend would go by faster than did people who listed 2 activities. Furthermore, and most central to our hypothesis, people who listed six activities thought that the weekend would be more enjoyable than did people who listed only 2.

Since the first study only studied anticipated enjoyment, we conducted a second study to test if the effect also influences actual enjoyment of an ongoing experience. In Study 2, participants listened to an enjoyable pop song (“Yours to Keep” by the Teddybears) while a timer either displayed the accurate timing, or instead displayed a slightly accelerated timer (seconds are updated each 0.8 seconds). Though consciously imperceptible to our participants, the latter timer gave the impression that time was moving faster. As predicted, people enjoyed the pop song more when the timer was fast, people enjoyed the song more than when the timer was slow. When the timer counted down however, the effect was completely eliminated. Participants in the fast timer conditions showed responses consistent with our previous findings: when the timer was fast, people enjoyed the song more than when the timer was slow.

Whereas the perceived fluency of the ongoing time progression should be equally salient in both conditions (counting up or counting down), the total time elapsed should be most salient when the counter is counting up. Participants with the timer counting up showed responses consistent with our previous findings: when the timer was fast, people enjoyed the song more than when the timer was slow. When the timer counted down however, the effect was completely eliminated. Participants in the fast timer conditions inferred greater enjoyment of the experience due to their surprise at the length of the elapsed experience rather than due to the suprisingly fluency of the ongoing experience.

From a theoretical perspective, these findings hint at the malleability of hedonic experience. Recent work has suggested that top-down processes only operate on preferences if that information is consciously encoded prior to consumption (Lee, Frederick, and Ariely 2006), but this work suggests that preferences can shift in a bottom-up manner, even when the influential information operates outside of conscious awareness. From a managerial perspective, these findings show how a subjective sense of time can operate on explicit preferences. Perhaps if managers can create a sense of time flying by, the consumption experiences they offer will be judged as more enjoyable.

“When I’m 64: Temporal Referencing and Discount Rates”

Shane Frederick, Massachusetts Institute of Technology
Daniel Read, London School of Economics
Robyn A. LeBoeuf, University of Florida

The Beatles song sharing our title refers to the future in two distinct ways. The lyrics begin “When I get older, losing my hair, many years from now...” and end “Will you still need me, will you still feed me, when I’m 64.” Though each of authors is still many years from 64, one of us recently “recognized” that he’ll be 50 in just 12 years, which didn’t feel nearly long enough to bridge the psychological distance between his conception of himself and his conception of a 50-year-old.

These ruminations suggest that our conception of the future, and the choices we make regarding it, may depend on the manner in which the future is described. Thinking about a given age may make the future seem more psychologically distant than the number of intervening years suggests – something that should increase discounting. On the other hand, our prior research on temporal referencing (Read, Frederick, Orsel, and Rahman, 2005, and LeBoeuf, 2006) suggests that an age reference may decrease discounting by directing attention away from the intervening time period, and toward other things (e.g., our stereotype of someone of that age, or our speculations of what our own life will be like at that age).

We explore the effects of temporal referencing in three studies. In Study 1, respondents specified the amount of money to be received 10 years hence required to achieve indifference to receiving $40 immediately. In the Delay condition, temporal distance was framed as “10 years.” In the Age condition, respondents first specified how old they would be 10 years from now, and then entered this value into the brackets (as shown below) before completing the matching task.

I would be indifferent between getting $40 right now or getting $_____ when I am [ ] years old.

Respondents were more patient when the temporal interval was marked by their future age rather than the number of intervening years; when faced with an age reference, they indicated that a
smaller future reward was sufficient to achieve indifference with $40 now.

Our second study was conducted using an on-line survey site. On the first screen, respondents entered their date of birth. On the following screen, they made twelve intertemporal choices. For respondents assigned to the *Delay* condition, the future was referenced as a number of years (e.g., $40 immediately vs. $250 in 10 years). For those in the *Age* condition, it was referenced in terms of the person’s future age, generated from their previously entered birthdate (e.g., $40 immediately vs. $250 when you are 48).

Once again, respondents were significantly more patient when the future was indexed by their future age. For example, while only 20% were willing to wait 10 years to get the $250 when it was “in 10 years”, 50% preferred that larger later reward if it was received when they were X+10 years old. Intriguingly, this framing effect diminished with age, and for respondents older than 60 there was no effect at all. We speculate that age becomes chronically salient for older respondents, since opportunities for retirement, for receiving social security, or senior citizen discounts all depend on individuals soon reaching specific salient age milestones.

In our third study, respondents were randomly assigned to one of four conditions, in which temporal distance was specified in one of four ways: as the *Delay* in years until the future reward or penalty, as the specified *Date* on which the future event would occur, as the *Age* that the respondent would be when the future event occurred, or as the number of *Years Older* the respondent would be at the time of the future event.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Phrasing</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Delay&quot;</td>
<td>SY in exactly 2 years</td>
</tr>
<tr>
<td>&quot;Date&quot;</td>
<td>SY on Sept 29th, 2008</td>
</tr>
<tr>
<td>&quot;Age&quot;</td>
<td>SY when you are 43</td>
</tr>
<tr>
<td>&quot;Years Older&quot;</td>
<td>SY when you are 2 years older</td>
</tr>
</tbody>
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Respondents were significantly more patient in the *Age* and *Years Older* conditions than in the *Delay* or *Date* conditions. The *Years Older* frame increased patience nearly as effectively as the *Age* frame. This is noteworthy because the numeric presentation in the *Older* frame was nearly identical to that in the *Delay* frame, arguing against a psychophysical explanation involving comparisons of the presented numbers. The words “years older” may prime (as might an “age” reference) the concept of a continuous persistent identity enduring across time demanding impartial treatment by the current self. In our fourth study, we explore whether these framing effects result from perceived temporal distance or perceived “connectedness” to future selves. We conclude by discussing the implications of this research for the marketing of financial instruments, such as IRAs, life insurance policies, and annuities.