



Invest now, drink later, spend never: On the mental accounting of delayed consumption

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Received 23 March 2006; received in revised form 11 May 2006; accepted 12 May 2006
Available online 7 August 2006

Abstract

Monetary transactions in which consumption is temporally separated from purchase naturally lend themselves to multiple frames and to alternative accounting schemes, which nonetheless maintain a modicum of discipline and authenticity. We investigate some of the relevant accounting rules, and find that advanced purchases (e.g., a case of wine) are typically treated as “investments” rather than spending. At the same time, consumption of a good purchased earlier and used as planned (a wine bottle opened for dinner) is often coded as “free”, or even as savings. However, when it is not consumed as planned (a bottle is dropped and broken), then the relevant account, long dormant, is resuscitated and costs associated with the event are perceived as the cost of replacing the good, especially if replacement is actually likely. Related phenomena and assorted implications are discussed. © 2006 Elsevier B.V. All rights reserved.

JEL classification: D90; D91

PsycINFO classification: 2340

Keywords: Mental accounting; Intertemporal choice

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1. Introduction

One of us bought a house recently that came with an industrial, uninsulated stove which violated residential building codes. A protracted search for buyers produced only one promising lead, the owners of a nearby café who were looking to do more cooking. What should they pay for a stove, a couple of years old, originally worth well above \$1000 but worthless to us and with no other buyers on the horizon? Some friendly bargaining (over very good coffee and pastries) soon led to a resolution. They would give us something dear to us but cheap to them: gift coupons to our closest and favorite local café! The ensuing months saw frequent visits to the café, with pocketfuls of decorated coupons, each worth \$5, and bearing no expiration date. The coffee, the cookies, and the breakfasts felt free. In fact, our many (and growing list of) friends were regularly being offered treats with the usual norms of reciprocity seemingly suspended. Those who did not know about the coupons thought we were wonderfully generous; those who knew, thought it was only fair – in fact, had we made them pay good money while in possession of those “free” coupons, they would have found us petty and cheap.

What was it about those coupons that made them feel so different from the cash we all knew they were worth? Would we have felt equally magnanimous had we lost the coupons rather than used them as intended? Would we have been so generous to our friends had the café owners paid us cash for the stove? And when we offered a friend a coupon, would it matter whether that coupon had been purchased at full price or gotten through these other means?

As this anecdote reveals, monetary transactions can sometimes be vague and confusing and can lend themselves to multiple representations. Mental accounting research has shown that slight variation in the naming, allocation, or organization of accounts can influence decisions in ways that are hard to reconcile with fundamental normative assumptions, such as the extensionality of outcomes and the fungibility of money (see [Thaler, 1999](#) for a review). One category of spending that often leads to mental accounting ambiguities is when the purchase and act of consumption are separated over time. In such situations the value of things can change between when they are acquired and when they are consumed due to a variety of factors, including depreciation, appreciation, market valuation, the cost of money, and personal taste.

Compared with unique works of art or personal mementos, the value of standard consumer items is relatively easy to gauge: the coffee makers in our kitchens or the cell phones we use to keep in touch with our families are worth their replacement cost (adjusted for depreciation, etc.). But even the subjective valuation of such standard consumer items, as it turns out, can be malleable and dependent on nuanced factors, such as the item’s history, destiny, whether it has fulfilled its intended use, whether we actually intend to “replace” it, etc.

Imagine, for example, that you and a friend each bought a \$20 bottle of wine years ago and decide to drink it tonight with dinner. When you drink your bottle, our findings below will show, it might feel that it costs you nothing, since you bought the bottle long ago and are simply getting to savor it now. But when your friend accidentally drops the bottle and breaks it, it feels that it costs her what it would cost to replace the bottle now, considerably more.

Because of a variety of intervening factors, the need to put a value on things can prove difficult and confusing. And while there is great malleability in the mental accounting of

delayed purchases, such accounting nevertheless follows some systematic rules. Not just any price comes to mind, and not just any worth can be seriously entertained. In his wonderful essay on the mind as a consuming organ, Tom Schelling provides a perfect description:

The problem is not the lack of imagination, but discipline and authenticity. Fantasy is too self-indulgent. Daydreams escalate. Before I can spend the \$10,000 that my opponent at poker bet because he thought that I was bluffing, I revise the figure to \$100,000; then I put it in gold at forty dollars an ounce, spend a couple of years hiking home from a plane crash in northern Canada, phone my broker to sell and hit the eight-hundred-dollar market, and start plotting to invest my two million in something equally good. By then I realize that it is all counterfeit if I can make it up so easily. (Schelling, 1984, p. 329)

Our purpose in this article¹ is to understand some of the mental accounting rules that allow people the flexibility to value things in multiple, fluid, and inconsistent ways while still providing a modicum of discipline and authenticity. Numerous past studies have documented related tendencies. We know, for example, that people are willing to pay substantially different sums of money for a bottle of beer to be consumed on a beach depending on whether they plan to buy it at a small bodega as opposed to a five-star hotel (Thaler, 1985). We also know that people value the cost of waiting a month differently depending on whether they are waiting for small or for large sums (Leclerc, Schmitt, & Dube, 1995), and that they prefer to pay after acquiring a fridge, but before taking a cruise (Loewenstein & Prelec, 1992). In the present work, we focus on how people represent the value of items as a result of alternative ways in which such value can be construed. Among other things, we argue that certain construals appear more natural in some contexts than in others, as with replacement cost, which comes more readily to mind when the wine bottle is broken than when it is drunk.

The article proceeds as follows. We open with studies that document people's mixed perception of the value of items whose consumption is temporally separated from their purchase. First, we find that people can avoid the feeling of having spent money when they make purchases that are seen as investments to be consumed at a later time. Next, we show that people do not feel that those purchases are costing them anything later when they are consumed. We then explore a variety of factors, for example, single versus aggregate purchases or usage, the nature of the items, and the salient role of historical cost in later evaluation, all of which can be seen to influence the mental accounting that is observed in the context of delayed consumption. We discuss the data and their implications, and conclude with some brief remarks.

We start by inquiring about people's perception of items (e.g., a bottle of wine), that have been in their possession for a while, and are now clearly selling for more than they were bought for. How much does drinking such a bottle of wine feel like it costs us? And what about giving it away? Or breaking it?

¹ This article has been "in progress" for years. Fittingly for an issue dedicated to Tom Schelling, we needed a deadline to help us finish it. Over those years we have benefited from the helpful comments of numerous colleagues. We received helpful and thoughtful comments on the current version from John Gourville, Drazen Prelec, and Suzanne Shu and we thank Orley Ashenfelter for letting us query his wine newsletter subscribers.

2. Study 1: The fluid value of wine

Respondents to this survey were subscribers to a wine newsletter, *Liquid Assets*, that used to be published by economist Orley Ashenfelter. These subscribers are highly knowledgeable wine consumers with substantial home cellars. Because of the association with Ashenfelter, many of the subscribers are also economists or business executives. One half of the respondents received the “giving away” version and the rest received the “drinking” version, both reproduced [with differences between versions in brackets] below.²

Suppose you bought a case of a good 1982 Bordeaux in the futures market for \$20 a bottle. The wine now sells at auction for about \$75 a bottle. You have decided to [give one bottle of this wine to a friend as a gift/drink a bottle of this wine with dinner.] Which of the following best captures your feeling of the cost to you of [giving away/drinking] this bottle? (Check one).

	Giving away (<i>n</i> = 97) (%)	Drinking (<i>n</i> = 76) (%)
(a) [Giving away/drinking] the bottle does not feel like it costs me anything. I paid for the bottle already, many years ago, and probably do not remember exactly what I paid for it anyway	30	30
(b) [Giving away/drinking] the bottle fees like it costs me \$20, the amount I roughly remember paying for it	17	18
(c) [Giving away/drinking] the bottle feels like it costs me \$20, the amount I originally paid for it, plus whatever the interest would have been on the money I paid	9	7
(d) [Giving away/drinking] the bottle feels like it costs me \$75, the amount it would take to replace it	30	20
(e) [Giving away/drinking] the bottle feels like I am saving \$55, because I am able to [give a \$75 gift/drink a \$75 bottle] for which I only paid \$20	14	25

Note first the lack of consensus among these seasoned wine drinkers. All five options presented receive some endorsement, with roughly a quarter of these experienced consumers each endorsing answers as diverse as “it costs me nothing”, “it costs me what I once paid”, “it costs me what it would take to replace”, and “I am making a profit”. The normative economic answer, a \$75 replacement cost, captures the way only 20% of those who drink the bottle think about it, and only 30% of those who give the bottle away.

Respondents were invited to include comments on their responses and many elected to do so. Several of these commentators expressed “mixed emotions”. For example: “I’d

² One interesting sidebar, not unrelated to the theme of this article, is that as an inducement to respond we told participants that they would be entered into a lottery for a single bottle of 1982 Lynch Bages, worth about \$75 at the time. We had 173 respondents (who paid their own postage), meaning that we recruited a rather large pool of respondents for less than 50 cents each. Perhaps it was the lure of a “free” bottle of wine that attracted them.

actually feel somewhere between (b) and (d) but closer to d for the gift question”. And, “Answer (e) is compatible with answer (b) and (c). Actually, I would answer (c) and (e) if possible. (d) would only be true if I intended to replace it, which is not likely”.

Following the initial scenarios, all respondents were then asked about the ensuing “breaking” scenario.³

Which answer would you choose if instead of [drinking the bottle/giving the bottle away], you dropped the bottle and broke it? How much would it feel like you had lost in this case? ($N = 173$)

(a) \$0	8%
(b) \$20	24%
(c) \$20 plus interest	11%
(d) \$75	55%
(e) a \$55 saving (relative to a bottle bought recently)	2%

As before, multiple evaluations strike people as compelling, although there are some substantial shifts. For one, there is a greater proclivity to think replacement cost when the bottle breaks. Breaking the bottle seems to make opportunity costs more salient than drinking the bottle or giving it away. Further, while a substantial proportion perceived a profit in consuming a valuable bottle for which they had paid only a little, and some felt they benefited from being able to gift an expensive item for which they paid much less, almost nobody perceived a profit in breaking a valuable bottle which came cheaply.

When we tally within respondents, we observe a massive shift towards replacement cost when the bottle breaks. Two-thirds of respondents in the “drinking” condition and half of those shown the “giving away” version changed their response to “replacement cost” in the “breaking” scenario from what had initially been another answer. Many who had considered the wine account “closed”, and the drinking of it free (if not sheer profit), appear to have resuscitated the dormant account once plans had gone awry and the bottle broke. It is noteworthy that this shift is not what one would expect from “hedonic framing”, i.e., from a free choice to frame as one wishes so as to maximize hedonic well being (see [Thaler & Johnson, 1990](#)). The shift also reveals a curious logic or lack thereof. Suppose I think that giving away the bottle costs me nothing, and the opportunity cost of breaking the bottle is that I can’t give it away. Why then is the cost of breaking the bottle its replacement cost?!⁴

Comments from the respondents offer additional insights into the thinking of these experienced wine consumers. For example:

In about 1974 I made a particularly good buy at the Pennsylvania State Stores. I was able to get a case of Beaulieu Reserve 1970 Cabernet for \$8.95 a bottle less 15% for case discount. That was immediately worth more. I do feel like I am drinking a *very* expensive bottle of wine (current value about \$100 per bottle) every time I drink one. But I am very conscious of what I paid for it. (Insurance executive)

³ Thanks to France Leclerc for suggesting this question.

⁴ Similar versions were administered to Princeton undergraduates, who showed highly similar patterns that were indistinguishable between students who had taken an economics course and those who had not.

The insurance executive clearly has multiple representations in mind.

I understand that, emotion aside, replacement cost is relevant for economic decisions. My ideal feeling will be if my '89 and '90 futures increase enough in value to sell half for my total cost and drink the balance with only pleasure in mind not money. (Investor, retired engineer)

The engineer is hoping for a mental accounting coup. If the wine he purchases doubles in (nominal) value, he can sell half and consider the remaining bottles “free”!

I find I have no difficulty drinking a bottle from my wine cellar which has a current market value of \$75 and an original cost of \$20. However, I do have a threshold of resistance which begins somewhere around \$100. Bottles at that market value and higher, I tend to save until they show signs of decline. (Retired Bank Treasurer, MA Economics)

The bank treasurer seems to have trouble drinking wine that has appreciated past the magic \$100 barrier, that is, until the wine starts to evolve into vinegar.

You left out the right answer. I *feel* the loss is \$75 less transaction costs of selling it (which are about \$15). So, I think of the gift as costing about \$60. Since I do have plenty of wine in lifetime inventory, net realizable value is correct. If I did *not* have sufficient life time inventory, I'd use replacement cost, \$75 plus commission, plus shipping – about \$90. Also you do not have tax treatment of gain correctly. I get to enjoy tax free the capital gain for \$20 + \$60. At a tax rate of 40% I have benefited $.40 * 60\% = \$16$. (Economist/Professor of Accounting)

Note the word “feel” in the second sentence (our emphasis). Since this respondent is a good friend (who was responding to the survey without knowing who was administering it) we can attest to the fact that he does consult the relevant tax code to determine his feelings.

The finding that a majority of our wine consumers think that drinking an old bottle either costs them nothing or actually saves them money led us to ask the next obvious question. Do they think they are spending any money when they buy the wine initially?

3. Study 2: “Investment” purchases: Why things do not cost when you buy them

As opposed to purchases that soon get consumed, those intended for a distant future consumption seem to allow for different accounting. In particular, since full value is retained post purchase, there is a perception that the related expense is not a simple “cost”, but rather an “investment”, to be liquidated at a future point in time.

About a year after our initial survey, subscribers to *Liquid Assets* were again requested to fill out a survey that presented them with the following scenario, and asked to indicate their level of endorsement of three alternative sentiments on a 1 (*strongly agree*) to 5 (*strongly disagree*) scale.

Suppose you buy a case of Bordeaux futures at \$400 a case. The wine will retail at about \$500 a case when it is shipped. You do not intend to start drinking this wine for a decade. At the time that you acquire this wine which statement more accurately captures your feelings? Indicate your response by circling a number on each of the scales provided.

	Mean
(a) I feel like I just spent \$400, much as I would feel if I spent \$400 on a weekend getaway	3.31
(b) I feel like I made a \$400 investment, which I will gradually consume after a period of years	1.94
(c) I feel like I just saved \$100, the difference between what the futures cost and what the wine will sell for when delivered	2.88

Again we see that while mental accounting rules have some flexibility, even mental accountants retain some discipline in coding outcomes. Thus while the most pleasing way of thinking about the wine purchase would be purely as a “saving” opportunity (option c), it is nonetheless option b, the “investment” option, that received significantly stronger endorsement than either of the alternatives ($t > 5.0$ in both cases; $p < .001$). Still, when the results of the two surveys are combined we see emerge the pattern that led to the title of this article. When buying the wine initially, consumers feel like they are investing, and ten years down the road when they drink the wine or give it away, a majority think it is either costing them nothing or actually saving them money: Invest now, drink later, spend never!

4. Study 3: Planned consumption: Why things do not cost when you use them

The invest now, spend never mental accounting scheme is intriguing, but one is naturally concerned that wine drinkers might be unusual. Perhaps all the alcohol has somehow corrupted their otherwise sensible mental accounting principles! To be sure that the concepts we had identified were not special to wine consumers we conducted another study with Princeton students concerning the purchase of concert tickets. Princeton students ($N = 203$) were asked to rate, on a 1 (*strongly agree*) to 5 (*strongly disagree*) scale, their level of endorsement of alternative descriptions of their feelings when purchasing a concert subscription in the scenario below.

4.1. Purchase

Try to imagine the following scenario. It is the Spring of your sophomore year and you plan to be on campus for your last two years. A student organization has decided to arrange a new concert series featuring just the sort of music you enjoy most. The organizers have taken the unusual step of selling two-year subscriptions to this series. The subscription guarantees you great seats to eight concerts, four next year and four the following year. Since you are committing so far ahead, the series is priced very attractively: Although single concert tickets will cost \$25, your series only costs \$120, or \$15 each. You have talked to the organizers and like the kinds of performers they intend to bring to campus, so you decide to buy the subscription.

At the time you make the purchase, how well does each of the following statements capture your feelings?

	Mean ($N = 203$)
(a) I feel like I just spent \$120, much as I would feel if I spent \$120 on a night out in New York	3.63
(b) I feel like I made a \$120 investment, which I will gradually consume over the course of the next two years	2.20
(c) I feel like I just saved \$80, the additional money I would have paid to buy the tickets one at a time	2.65

As before, the “investment” option, received significantly stronger endorsement than either of the other alternatives ($p < .01$). Whereas the perception of a simple cost was unpopular, a sheer savings perspective was more appealing, although less so at time of purchase, when the concerts had not yet been savored.

So what happens when those in possession of tickets finally attend the concerts?

4.2. Attendance

It is now the Spring of your senior year and there is one remaining concert in the series to which you subscribed two years ago. In fact, the last concert is a group that has become very popular, and tickets are currently selling for \$50 around campus. You are about to go to the concert. Which of the following best captures your feeling of the cost to you of attending this concert:

	Mean ($N = 68$)
(a) I feel like this costs me \$50, the current worth of the ticket and the price I could have gotten if I had chosen to sell	3.96
(b) I feel like this costs me \$25, the list price of a single ticket to this concert	4.37
(c) I feel like this costs me \$15, the price I paid for the ticket	2.37
(d) I do not feel like this costs me anything, since I have already paid for the ticket, a long time ago	2.48
(e) Going to the concert feels like I am saving \$35, the difference between what I paid for the ticket and what it would cost now	2.40

The most common sentiments among those who have the tickets and proceed to use them as planned, are c–e, namely, historical cost, no cost, and the profit felt by being able to attend a highly valued show, for which one had paid less. Those three, indistinguishable from one another in their appeal, were all significantly more appealing than the ticket’s list price, or its cost of replacement.

Consider a participant who rates highest options b (“investment”) or c (“saving”) in the “Purchase” scenario, and then rates either options d (“no cost”) or e (“saving”) among his two highest in the “Attendance” scenario. This is a person whose experience of buying a ticket and going to the theater at no point includes a clear feeling of spending. (We can call this person a “never-spender”.) Among all those presented with the two foregoing scenarios, 76% (52 out of 68) conformed to the never-spender pattern.

But what if, instead of using the tickets as planned, people were to suddenly lose them?

4.3. Loss

It is now the Spring of your senior year and there is one remaining concert in the series to which you subscribed two years ago. In fact, the last concert is by a group that has become very popular, and tickets are currently selling for \$50 around campus. Unfortunately, you have lost your ticket, and there is no way of obtaining a replacement ticket from the organizers. Which of the following best captures your feeling of the cost to you of losing this ticket:

	Mean ($N = 67$)
(a) I feel like this costs me \$50, the current worth of the ticket and the price I could have gotten if I had chosen to sell	2.43
(b) I feel like this costs me \$25, the list price of a single ticket to this concert	4.06
(c) I feel like this costs me \$15, the price I paid for the ticket	3.60
(d) I do not feel like this costs me anything, since I have already paid for the ticket, a long time ago	4.33

When they are lost, the same tickets that would have been handed to the usher with a feeling that they cost nothing, now are most likely to be seen as costing their full replacement cost (all differences $p < .01$). Just like the broken wine bottle, the tickets formed part of a dormant account which, upon them being lost, was resuscitated at full replacement cost.

To summarize, at time of purchase the tickets are seen as an investment or even, to a somewhat lesser extent, as a savings; and when they finally attend the concert, many perceive the use of the ticket as incurring no cost. Hence, many people invest initially and then enjoy the concerts for free, thus never really feeling like they spent. Unless, of course, the ticket gets lost; this then elicits sentiments of loss worthy of full replacement cost.

5. Study 4: Local versus global representations

In many contexts people have been shown to apply local, narrow, “piece-meal” frames to decisions as opposed to a more global, overall perspective. For example, prospect theory’s reliance on changes as the carriers of utility assumes a narrow frame whereas the standard expected utility of wealth formulation in which all gambles are integrated with other assets represents a global frame. In our present context, a decision framed locally may highlight immediate expenses, whereas a more global perspective may induce feelings of “investment”.

The following scenario explores people’s perceptions of the cost of missing a \$20 gym session, and shows that the feeling of having wasted \$20 is significantly stronger (and the feeling of having wasted nothing significantly weaker) when people pay per-session than when they have paid for a full year. Participants were presented with one of two versions (shown in brackets) of the scenario below, and with the same scale for showing their endorsement as before, ranging from 1 (*strongly agree*) to 5 (*strongly disagree*).

Imagine that you have a membership to a gym in a nearby town that you travel to for business on a regular basis. You go to this gym exactly once a week: every Mon-

day night when you're in town. [The membership allows you to pay \$20 (non-refundable) per each visit./The membership costs you \$1000 a year (i.e., roughly \$20 per visit).] One Monday, just after you have arrived and changed, you receive a phone call that requires you to leave and forego your exercise that evening. How well does each of the following statements capture your feelings about the cost of the missed workout? (Please indicate your response by circling a number on each scale provided.)

	Frame	
	Per-session	Yearly
(a) I feel like I just wasted \$20, which is what I paid to work out that evening	1.98	2.70
(b) I feel like I wasted nothing, since my visit had already been paid for, and sometimes you just can't take full advantage of things to which you are entitled	3.77	3.03
(c) I feel like I wasted something, perhaps time, perhaps money, but no specific amount or measure readily comes to mind	2.95	2.40

As shown in the right-hand columns, the most compelling sentiment triggered by missing a gym session amounted to \$20 in the local, “per-session” frame, and to thoughts that were less concrete or monetary under the global, “yearly” frame. (All respective ratings in the per-session versus yearly frames differ at $p < .01$.) A third, “monthly” frame yielded endorsements that fell in between these two frames.

6. Study 5: Local accounting implications

Related to the global versus local perspectives discussed above is an inherent asymmetry that often applies in the context of purchase and consumption: Purchases are often made with a global perspective in mind – that's the kind of thing I'd like to do or the type of item I'd like to use from now on – whereas consumption often induces a local perspective – today I'll do this, or I'll use that. We explored this pattern in people's perception of an expensive acquisition – a fancy espresso maker – intended to last for a long while, and their ensuing perspective as they enjoy the latté it produces each day.

Respondents ($N = 56$) were presented with one of the following two scenarios. The first inquired about their sentiments around purchasing the machine, and the second explored their perspective on individual mornings.⁵

6.1. The moneysaving espresso machine

(Buying the machine:) Suppose that you are a devoted coffee drinker and that every morning, on your way to class, you used to go to your favorite café and purchase a large latté for \$3.00. Eventually, you decided to purchase a first-rate, \$500 Espresso maker instead, so that you could make your own latté each morning, saving the

⁵ We thank Sendhil Mullainathan for suggesting this, in his case autobiographical, scenario.

repeated trip and expense. Please indicate which of the following best captures your feelings about this expense:

I simply feel like I spent \$500.00, much as I would feel if I had just spent \$500.00 on an expensive weekend getaway	36%
I feel like I just made a \$500.00 investment, which I will gradually consume over the course of the next few months or years	64%

(Drinking the coffee:) Suppose that you are a devoted coffee drinker and that every morning, on your way to class, you used to go to your favorite café and purchase a large latté for \$3.00. Eventually, you decided to purchase a first-rate, \$500 espresso maker instead, so that you could make your own latté each morning, saving the repeated trip and expense. Every morning now you make your own latté at home, which is every bit as good as the one you used to get at the Café. Please indicate which of the following best captures your feelings about each morning's latté expense:

Each morning's latté feels like it is costing me two or three dollars, which will gradually add up to make for the \$500 espresso machine expense	42%
Each morning's latté feels like it is not costing me hardly anything (except for the negligible price of the ingredients)	19%
Each morning's latté feels like it is saving me nearly three dollars, which I would be spending at the Café had I not owned the machine	39%

As can be seen by the percentages to the right of the options, two-thirds of respondents purportedly buying the expensive espresso machine predicted feeling that this purchase, rather than mere spending, was more of an investment, to be consumed over the ensuing months or years. Yet, as they imagined sipping their home-made espresso each morning, nearly two-thirds of respondents felt this was costing them nothing or, in fact, was saving them money they would otherwise have spent by going out for coffee.

The pattern above suggests a kind world in which the machine (which is difficult mentally to amortize) never really cost its full expense, and the coffee it yielded was essentially free or even a bit of a money saver. Interestingly, in line with the notion of account resuscitation discussed earlier, all this gets revised once the machine breaks, for example. We asked a separate group of respondents ($N = 30$) who were presented with the same buying-the-espresso-machine scenario above how it would feel if after two months of regular use the machine were irreparably broken. Over ninety percent of these respondents predicted feeling like the machine cost them either the full \$500, or the \$500 adjusted for coffee-related expenses saved during its use. Finally, of a group ($N = 30$) presented with a similar scenario in which the machine irreparably breaks after four years, rather than two months, over ninety percent of respondents reported no cost at all, or the renewed feeling of having saved over all those many mornings of averted coffee costs.

7. Study 6: The nature of items and thoughts of their replacement

As we have seen above, minor situational nuances, such as whether a bottle is given away or broken, can influence whether replacement cost comes to mind. As it turns out, the nature of the item that is being considered can itself influence the likelihood that replacement cost will appear compelling.

In one study, participants ($N = 97$) were asked to contemplate one of two vignettes in which, as a result of a leaky roof, some valuable possessions had been damaged. One vignette described the loss of an item with little sentimental value and a clear replacement cost:

7.1. *An autographed photo*

Since the seventh grade you have been collecting autographed celebrity photos. One item from that collection was lost: an autographed mint condition photo of a well-known movie star from the 50's who has since died. You found this item in an old thrift store a few years ago; a similar item in similar condition now sells for about \$1000.

The other item had clear sentimental value, but was unlikely to be replaced:

7.2. *Some inherited stamps*

You inherited a small collection of six stamps from your late, beloved grandfather. These were stamps he had removed from letters received from your grandmother while he was at the front during the war. These same stamps, in similar condition, now cost about \$1000 to buy. Although you have never had any interest in stamps, and have never bought one, you always cherished these stamps that your grandfather loved.

Participants were asked to indicate which of the following two descriptions better characterized how they felt about the cost incurred by them in losing the item:⁶

- (a) It does not feel like the loss of [this photo/these stamps] costs me any money – the loss feels mostly emotional.
- (b) Although also emotional, the loss of [the photo/the stamps] feels like it costs me \$1000, the amount it would take to replace [it/them] today.

Seventy four percent of respondents chose description a – the mostly-emotion-not-money sentiment – when presented with the beloved grandfather's stamp collection, whereas only 25% chose this description in the context of the lost photo ($\chi^2 = 22$, $p < .0001$). As predicted, the grandfather's "irreplaceable" collection was significantly less likely to be evaluated at the \$1000 replacement cost, and significantly more likely to be evaluated as representing a mostly emotional loss; the photo, on the other hand, appearing easily replaceable and generating little emotion, was perceived by the majority of respondents as roughly worth its cost of replacement.

⁶ Participants had the option to write their own open-ended responses instead. This option was exercised by a small minority, whose data, for ease of presentation, is not included here. That data was not inconsistent with the rest.

We then ran a within-subject replication, where we provided participants with a more nuanced array of alternatives. Following the presentation of similar vignettes describing either the loss of inherited stamps or of a non-nostalgic collector's item (a poster in this case), participants ($N = 51$) were invited to choose from among the following six alternatives.

When I think of the loss of [my great-grandfather's favorite stamps/this poster], I feel:	Poster	Stamps
(a) A sense of emotional loss; the monetary value hardly figures in it	12%	54%
(b) Some emotional loss, and also some financial loss, although both are hard to quantify	29%	28%
(c) Some emotional loss, and a financial loss of \$300, the amount that had been spent on [these stamps/the poster]	20%	12%
(d) Some emotional loss, and a financial loss of \$1000, the amount it would take to replace [these stamps/the poster] today	29%	6%
(e) No emotional loss, but a clear financial loss of \$300	8%	0%
(f) No emotional loss, but a clear financial loss of \$1000	2%	0%

Reminiscent of our opening examples, the scenario concerning the non-nostalgic poster elicited a variety of sentiments. While every available alternative was chosen by at least someone, the majority reported some combination of emotional and financial loss (options b–d), with only a few indicating only one and not the other (options a, e, and f). In contrast, the more nostalgic stamps led over half of the respondents to report an emotional loss accompanied by no loss of monetary value (and none to report a financial but no emotional loss.)

8. Study 7: The historical accounting of purchases and bonuses

As observed in the opening vignette, the willingness to consider multiple representations of worth often leads to an accounting partly based on an item's history, which can appear quite different depending on whether the item was purchased or obtained for free.

We once found ourselves at an airport waiting to take the same flight. One of us was in possession of upgrade coupons to first class, which he offered the other so that we could sit together. Some of these coupons had been purchased from the airline, whereas other, identical coupons had been obtained as rewards for trips taken. We soon agreed, much to our bemusement, that if one of the purchased coupons were to change hands, the recipient would insist on paying for it, whereas if a free coupon were offered, any request for remuneration would be considered offensive. We decided to see whether we were unique in this predicament.

8.1. Airline coupons

Princeton students were presented with one of the following scenarios.

A number of airlines have recently introduced “upgrade coupons”, which can be bought by anyone for \$35 each and used to upgrade from economy to business-class

on domestic flights of up to 1000 miles (several coupons can be combined for longer flights). Suppose you are flying with a friend who has upgraded to business class and who is in possession of two additional such coupons: one that he purchased for the standard price of \$35, and another that he received from the airline as a free bonus. Just one coupon is required for upgrade on the current flight, and your friend offers you [the coupon that he purchased/the bonus coupon which he got for free] so that you can upgrade as well, allowing you to sit together.

What do you think is the most appropriate thing to do?

	Purchased (<i>n</i> = 57) (%)	Free (<i>n</i> = 58) (%)
(a) Pay your friend \$35 for the coupon	25	5
(b) Consider it a gift and not pay for the coupon	32	57
(c) Pay some, but not the full amount for the coupon (for example, half the price)	44	38

As predicted by our own behavior, those who contemplated a coupon that had been purchased felt more compelled to pay for it than had those who considered an identical coupon that was obtained for free ($p < .01$). We also ran a third version where the coupons – those purchased and those received at no cost – could not be told apart. This “indistinguishable” version yielded intermediate results: the percentage of respondents who chose to pay at least some amount was 69% for those presented with the purchased coupon, 43% for those offered the free coupon; and 61% among those presented with the indistinguishable coupons. These findings have implications for gift giving that we discuss below.

9. Study 8: The distorting influence of historical cost

Coding the cost of usage in terms of historical costs instead of replacement cost is particularly likely to arise in contexts where current valuation is fluid and uncertain and historical cost is salient. Consider, for example, collector items, such as stamps.

9.1. Stamp collection

Respondents ($N = 154$) were presented with a scenario in which they were in possession of a valuable stamp collection, which they were considering selling. For half the respondents the collection had been purchased at a greater nominal price than for the rest, although the current worth was precisely the same for both groups.

Imagine that you have inherited a distant relative’s stamp collection. In the collection there is a valuable special-edition series of a dozen stamps. Serious collectors with whom you have consulted agree that the series is currently worth about \$1100. [In 1992, when the series was first issued, it was worth \$1000./In 1968, when the series was first issued, it was worth \$250.] You would very much like to sell the series, and have spent a lot of time looking for buyers, but buyers for such stamps are hard to find. You have just met a collector who is willing to offer you \$800 for the series. Would you sell it for that amount?

	\$1000 (%)	\$250 (%)
Yes	31	54
No	69	46

Apart from the difference in historical cost, respondents are facing an identical decision. Adjusted by the CPI, \$250 in 1968 is the equivalent of \$1000 in 1992 dollars. Moreover, all respondents are now being offered \$800 for a collection currently worth \$1100. The difference in historical costs, nonetheless, had a significant impact on people's valuation: Those in possession of a collection purchased for \$1000 were less willing to sell it at below current value and at a nominal loss than their counterparts, who owned an identical collection purchased for only \$250 (31% versus 54%, $p < .01$).

10. Study 9: Historical cost and non-monetary decisions

Historical cost, combined with money illusion (the tendency to focus on nominal rather than real worth; see Shafir, Diamond, & Tversky, 1997) appears to influence people's willingness to sell items that were historically acquired for more rather less, as well as items that were purchased as opposed to those gotten for free. As it turns out, the intrusion of historical cost can also be observed in the context of decisions that are no longer monetary in nature in ways that look quite paradoxical.

10.1. *The shoes do not fit*

Respondents were presented with one of two (bracketed) versions of the scenario below, and provided with a 7-point scale (1: *not at all*; 7: *certainly*) on which to indicate the likelihood they would donate the shoes under consideration.

Imagine that you bought a pair of shoes [for \$55 about a year ago./for \$250 about a year ago. You normally do not spend this much on a pair of shoes, but] You liked the shoes a lot when you bought them and thought you would wear them often. Alas, you wore them a few times but you found that they hurt your feet. The shoes are still in fashion, but they have now been sitting at the back of your closet unworn for 11 months. You are now putting together some things to donate to the Salvation Army. How likely are you to donate these shoes?

People's reported tendency to give to charity a pair of shoes they will not wear was influenced by the shoes, historical cost, with those who spent more reporting a significantly lower likelihood of donating the shoes than those who had paid less (3.08 versus 4.88; $p < .0001$). Reminiscent of the earlier wine collector who could not afford to drink the good wine in his cellar until it went bad, it appears that in the present context the better the shoes the more likely they are to remain, unused, in the back of the closet.

There is an alternative interpretation: perhaps people are hesitant to donate high-quality items, not because of what they cost, but for what they symbolize. To explore this possibility, we ran an additional version, otherwise identical to the above, in which the shoes, which had been selling for \$250, were purchased for \$55 on sale. The reported likelihood of donating the shoes was significantly greater in this scenario than in the original \$250 scenario (4.31 versus 3.08; $p < .001$), where the shoes were of presumably comparable

quality, but different historical cost. Interestingly, and in accord with the notion of multiple valuation sources, this last version differed also from the original \$55 version (4.31 versus 4.88; $p < .07$), suggesting that both the historical \$250 label as well as the \$55 cost had some influence on current valuation.

Finally, we replicated the above pattern in a within-subject design, where participants ($N = 72$) were presented with the same shoes-that-do not-fit scenario as above, but were now queried successively about their willingness to donate the shoes in three distinct situations: When they had paid \$55 for them; when they had paid \$250; and when they had paid \$55 during a sale on shoes originally marked \$250. The ratings obtained for the three questions (4.79, 2.74, and 4.30, respectively) essentially replicated the between-subjects data above: Reported likelihood to donate the shoes was significantly higher in the \$55 than in the \$250 version, with the \$250/\$55 sale version yielding in between ratings significantly different from either of the other versions.

11. Discussion and implications

Purchases that are made and immediately consumed offer little opportunity for creative mental accounting besides the chance for the transaction utility (Thaler, 1985) that accrues when a particularly good or bad deal takes place. When you go buy lunch at the usual place for the usual price, there are no mental accounting degrees of freedom, and essentially no mental accounting “entries” occur. In contrast, when purchases and consumption are separated or “decoupled”, the term used by Prelec and Loewenstein (1998) and Gourville and Soman (1998, 2001), a certain amount of flexibility is available, as the studies we have reported here show. Our principle findings are the following:

- As Schelling suggested, there are limits to the amount of self-deception one can engage in. People do not frame purchases hedonically.
- The consumption of a good purchased much earlier is often coded as “free”, or even better, a money-saving event.
- Advanced purchases are typically treated as “investments” rather than spending.
- When an item is not consumed as planned (a bottle is dropped and broken) that account, long dormant, is resuscitated and costs associated with that event are now likely to be perceived as the cost of replacing the good, especially if replacement is actually likely.
- Utilization, “as planned”, of a durable good does not produce a mental accounting entry similar to depreciation. Use of that durable item is “free”.

There are numerous implications to these findings. We discuss a few here.

11.1. Time shares

The “invest now, consume later, spend never” frame is obviously an attractive one for the wine connoisseur, and seems to be within the limits of self-deception. Sellers of other goods would find it advantageous to suggest this frame to their potential customers. One successful illustration of this strategy is the vacation time-share business. Typically, vacationers are approached about time share purchases while on vacation at resort intensive communities such as golf, beach, and skiing destinations. “Investors” are offered the fol-

lowing deal: For an up-front expenditure now of a given amount (typically tens of thousands of dollars or more) and an annual “nominal maintenance fee” the vacationers are entitled to a week (or more) each year in a given property, for free, forever. Since the up-front purchase is surely coded as an investment, and even the maintenance fee is decoupled from the actual visit, vacations are experienced as free.

11.2. Prepaid cabs⁷

Many urban households appear to own a car (or a second car) at an expense (for depreciation, parking, insurance, maintenance, etc.) that greatly exceeds the costs of taxis and car rentals that would compensate for the absence of such a car. Of course, there are convenience advantages to owning a car, but if the cost of car ownership exceeds the taxi and rental costs by enough it may be mental accounting problems rather than convenience that are driving the decision making. When a car owner uses her car to go grocery shopping, the research we have reported above suggests that she will think of the cost of that trip as essentially zero (assuming parking is free). In contrast, the round-trip cab fares of \$14 are unambiguously coded as an “expense” associated with the shopping trip, and are aversive. Similarly, spending \$100 to rent a car for a ride out into the country seems like an outrageous splurge. How can a consumer avoid spending \$8000 a year to own a car in order to avoid \$4000 a year in taxis and car rentals? We suggest that car rental firms, taxi companies, and especially “car sharing” companies such as iGo might profitably offer pre-paid plans aimed at this market. (An ad campaign might stress the number of cab rides that can be had for merely the cost of insurance and parking). The monthly (or, even better, annual) fee will be decoupled from the cab rides, which will then become free. Indeed, if these bulk buyers of cab rides are offered a discount, the cab rides might even be turned into money saving opportunities. Consumers might create a similar system on their own. For example, suppose a consumer sets up a cab ride account with a friend or secretary. Money is deposited into the account annually, and then when cab receipts are turned in, the consumer is “reimbursed”.

11.3. Insuring heirlooms

Suppose a friend has inherited a painting from an eccentric Aunt. The painting is unique and valued at \$100,000. Though your friend likes art, he has no other art works worth more than a few thousand dollars. Your friend has asked his homeowners insurance company about insuring the drawing and was told that works of art valued over \$10,000 require a special rider. For this piece, the cost would be \$1000 per year, which would cover any type of loss, from theft to fire. Your friend asks your advice about whether to purchase the insurance. What do you say?

The findings of this article offer an interesting perspective on insuring unusual items such as works of art. In the scenario described above, if the painting is stolen and your friend receives a \$100,000 check from the insurance company he is very unlikely to buy another painting of comparable worth. The emotional loss of the painting is uninsurable, and the monetary loss is actually immaterial! Why then insure the painting? If a family

⁷ This example is also discussed by [Prelec and Loewenstein \(1998\)](#).

heirloom ring will never be sold or replaced if lost, then its monetary value should be pretty much irrelevant to the decision to insure. This view was apparently shared by the management of the Isabella Stewart Gardner museum in Boston.⁸ The museum and its contents, including hundreds of very valuable paintings, are as they were when Ms. Gardner lived there. The terms of her will stipulated that nothing ought to be changed, and no additional works of art purchased, so the museum's curators decided not to insure its contents, given the very high insurance premiums that would have to be paid. The lack of insurance came to light when thieves stole twelve works of art with an estimated value of over \$200 million. Although the lack of insurance certainly caused second-guessing, the fact that replacement was not an option makes the museum's decision to leave the paintings uninsured understandable in light of our findings, and perhaps even sensible. Along similar lines, we see little wisdom in a family paying a lot of money to insure an heirloom ring that is neither worn nor will ever be sold or replaced if stolen.

11.4. Strategic gift giving

In the all important competitive game of reciprocal gift giving, there are important insights to be gleaned from both the wine example and the airline coupon study. The gift of a "free" upgrade coupon produces a much smaller gift debt than that of a coupon that had been purchased for good money. Now, consider two couples going out to dinner at a BYO restaurant. One couple brings an old bottle that, as in our original example, once cost \$20 and is now worth \$75. How much "credit" should that couple get toward the cost of the dinner? And, would they get more credit if they had stopped at the wine shop and bought a bottle for \$50? Finally, what if one couple brings the former and the other the latter bottle? Who owes whom how much?

11.5. Conclusion

Monetary transactions naturally lend themselves to multiple frames and to alternative accounting schemes. Under some circumstances, an item's value is easy to gauge. The bottle of wine which I bought at the store yesterday, and which I can return today, is worth what I paid for it; and the value of my two-year old car falls within some reasonably narrow range of its published *blue book* value. In other cases, mental accounting, which can be malleable, flexible, and confused, matters.

At one extreme, the value of unique items can be largely subjective. What is the worth of a painting by an unknown painter that I find beautiful? And how much more should I be willing to pay if it was once part of Mick Jagger's personal collection? Amusing examples can be gleaned in the domain of sports memorabilia, a business estimated in the US at (roughly, since it is highly decentralized and unregulated) \$1–6 billion a year. The value of memorabilia is determined entirely by what people will pay for them. But when one person is willing to pay some amount, it is not always clear that there are many who would do the same. The baseball that Mark McGwire hit for his 70th homerun sold recently for \$3M; yet, the market for used baseballs at that price is severely limited. Not to mention some of the following: \$8000 for false teeth worn by Ty Cobb; \$2400 for pitcher Tim Hudson's dis-

⁸ Thanks to John Gourville for suggesting this example.

carded goatee shavings; \$25,000 for Nolan Ryan's jockstrap; over \$10,000 for Arizona Diamondback Luis Gonzalez's already-chewed bubble gum.

What drives people to make such collector purchases are presumably a variety of narratives, motivated by personal, affective, and other considerations that are largely non-market based. A Maryland lawyer who has spent a large fortune on Ted Williams collectibles, which he displays in his office, explains: "I cannot go to Fenway Park, but I can go into my office and long to be at a Red Sox game. It makes me recapture my childhood, and renews the good feelings I had then". (*The Week*, February 11, 2005).

Schelling (1984) has beautifully captured several nuances of such "mental consumption":

If a gourmet host dawdled thirty minutes choosing the grandest meal of his career, looking at the raw meat shown him by the chef, discussing wine with the wine steward, watching it brought to the table and tastefully served; smiled at the friends assembled around him, delicately sampled the wine and nodded his approval, and watched the first course served impeccably onto everybody's plate – and died instantly of a heart attack – we'd be tempted to say that the last half hour of his life was perhaps the best half hour of his life. More than that, we might say it was the most enjoyable meal of his life, one of the best he had ever "consumed." (p. 343)

A final thought. It is reasonable to ask about the normative value of mental accounting rules we have highlighted in this article. The wine collector who takes out that old bottle knows that it is "worth" quite a bit; that is why he has saved it for a special occasion. Still, if the thought that it costs nothing to consume that bottle makes for a better experience, who is to say that he would be better off thinking like our accounting professor friend whose feelings about drinking a bottle of wine depend on the current Fedex shipping costs and tax codes. Rational is not necessarily happy, and irrational gives you the rare opportunity to enjoy "free" drinks.

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