

Opportunity Cost Neglect

SHANE FREDERICK
NATHAN NOVEMSKY
JING WANG
RAVI DHAR
STEPHEN NOWLIS*

To properly consider the opportunity costs of a purchase, consumers must actively generate the alternatives that it would displace. The current research suggests that consumers often fail to do so. Even under conditions promoting cognitive effort, various cues to consider opportunity costs reduce purchase rates and increase the choice share of more affordable options. Sensitivity to such cues varies with chronic dispositional differences in spending attitudes. We discuss the implications of these results for the marketing strategies of economy and premium brands.

Students of economics are taught that decisions require the consideration of opportunity costs—the unrealized flow of utility from the alternatives a choice displaces (Alchian 1968; Buchanan 1969; Nozick 1977). The assumption that consumers consider the opportunity costs of a decision is not only upheld as a “law” of consumer behavior applied to idealized consumers in economic textbooks but also appears to be widely assumed about actual consumers. For example, Becker, Ronen, and Sorter (1974, 327) contend: “Decision makers confronted with a showcase of beluga caviar consider how much hamburger they could buy with the money [that] a pound of caviar costs. . . . People intuitively take opportunity costs into account.” Okada and Hoch (2004, 313) similarly conclude: “The opportunity cost

of money is easy to assess. Money has a readily exchangeable market, is highly liquid and fungible, and can be saved. A dollar is a dollar . . . and so what comes to mind as the next best use for money remains fairly constant across situations.”

Evaluating opportunity costs requires consumers to consider outside options that are not explicit components of a purchase decision. The assumption that they do so is inconsistent with much psychological research showing that judgments and preferences are based primarily on information that is explicitly presented (Kahneman and Frederick 2002; Slovic 1972). The assumption is also inconsistent with an experience one of us had while shopping for stereos. This customer was frozen in indecision between a \$1,000 Pioneer and a \$700 Sony, and the salesman intervened, framing the choice as follows: “Well, think of it this way—would you rather have the Pioneer or the Sony and \$300 worth of CDs?” Remarkably, the decision that seemed so difficult just moments before was no longer even close—the Sony was at the cash register moments after the word CDs escaped the salesman’s mouth. A big pile of new CDs seemed far too steep a price to pay for the Pioneer’s slightly more attractive speakers.

The consumer in the forgoing story could subtract \$700 from \$1,000 and was capable, in principle, of recognizing that \$300 can be used to purchase \$300 worth of CDs. Nevertheless, that particular perspective was overlooked despite nearly an hour of contemplating the choice. While this anecdote may not be representative of all consumer decisions, we believe that opportunity costs are often neglected and that effort alone will not typically overcome this neglect. We propose that consumers may not spontaneously consider opportunity costs as economics textbooks hypothesize and as consumer behavior researchers often assume. As a result,

*Shane Frederick (Shane.Frederick@yale.edu) and Nathan Novemsky (Nathan.Novemsky@yale.edu) are both associate professors of marketing at the Yale School of Management, Yale University, PO Box 208200, New Haven, CT 06520-8200. Jing Wang (janewang@smu.edu.sg) is assistant professor of marketing at Singapore Management University, Lee Kong Chian School of Business, 50 Stamford Road, Singapore, 178899. Ravi Dhar (Ravi.Dhar@yale.edu) is George Rogers Clark Professor of Marketing at the Yale School of Management (School of Management, Yale University, PO Box 208200, New Haven, CT 06520-8200. Stephen Nowlis (Stephen.nowlis@asu.edu) is the AT&T Distinguished Research Professor of Marketing at the Carey School of Business, Arizona State University, Main Campus PO Box 874106, Tempe, AZ 85287-4106. The authors thank Daylian Cain, Zoë Chance, Eric Gold, Ryan Hamilton, Daniel Kahneman, Barak Libai, John Little, George Loewenstein, John Lynch, Daniel Mochon, Dražen Prelec, Daniel Read, Eldar Shafir, Paige Skiba, Catherine Tucker, Ray Weaver, Juan Juan Zhang, and Ezra Zuckerman for valuable comments. The authors thank Rebecca Ratner for proposing study 4. Correspondence concerning this article should be addressed to Shane Frederick.

John Deighton served as editor and Ann McGill served as associate editor for this article.

Electronically published April 22, 2009

consumer preferences can be influenced by various manipulations that bring to mind opportunity costs, as we demonstrate in several studies described below.

OPPORTUNITY COST NEGLECT

In accounting parlance, incurred expenses and other negative cash flows are termed “out-of-pocket” costs, in contrast with “opportunity costs,” which refer to the absence of potential positive cash flows (e.g., salary that is not earned while one is in school). In this article, we propose that opportunity costs are not merely underweighted relative to some corresponding out-of-pocket costs (as argued by Thaler [1980]) but may often be neglected entirely; that is, consumers may not explicitly consider the outside goods that an expenditure displaces.

This contention draws support from the finding that decision makers restrict their thoughts to salient situational elements and neglect relevant information that remains implicit. For example, when participants were permitted to ask questions about some opportunity (such as going to see a film in a foreign city) before deciding whether to do it, their inquiries pertained almost exclusively to the focal event rather than to possible alternatives (such as visiting a museum or attending a sporting event; Legrenzi, Girotto, and Johnson-Laird 1993). In studies of probability judgments, outcomes not explicitly represented are often ignored or underweighted (Fischhoff, Slovic, and Lichtenstein 1978; Tversky and Koehler 1994). In research on affective forecasting, judgments about one’s current or future well-being are excessively sensitive to current mood or the domain that the research instrument happens to make momentarily accessible, to the neglect of other relevant factors (e.g., Loewenstein and Frederick 1997; Schkade and Kahneman 1998; Wilson et al. 2000). In research on intertemporal choice, Loewenstein and Prelec (1993) found that consumers chose differently when the implicit alternative to dining out was explicitly described as “eating at home.”

The repeated finding that people focus only on explicitly presented details and fail to spontaneously “fill in” the logical consequences of a choice or judgment suggests that opportunity costs are likely to be neglected, since computing the opportunity cost of a decision requires the decision maker to actively generate alternatives that are not explicitly provided. Thus, frames that enhance the salience of opportunity costs, such as that used by the stereo salesman, should evoke thoughts about alternative uses of money that consumers would not have generated themselves. This, in turn, should deter any focal purchase and make cheaper options more attractive than expensive options. The stereo salesman’s suggestion to use the \$300 price difference on CDs (rather than on the more expensive stereo) may have been particularly effective because CDs complement the stereo. Even if our narrator had spontaneously conjured alternate uses for the \$300, he may not have considered anything as attractive as the CDs. However, our experiments will show that cues to consider opportunity costs will influence choice, even the

placebic reminder that money preserved by forgoing some purchase will be available for other purchases.

In studies 1a–1c, we show that purchase rates are reduced when the “not buy” option is described as “keeping money for other purchases” and that preferences shift toward cheaper options when the price difference is made explicit, even without mentioning other purchases. Study 2 replicates these findings and argues against another account: that drawing attention to the price difference segregates it from the total price, thereby increasing its impact. Study 3 provides direct evidence that specifying the price difference as residual cash brings to mind thoughts of purchasing outside goods and suggests that the efficacy of such frames remains even under conditions promoting deliberation. Study 4 shows that opportunity costs can be brought to mind by priming alternative uses of money outside the purchase context. The final study shows that sensitivity to manipulations that bring opportunity costs to mind is moderated by individual differences in the “pain of paying.” We conclude by discussing the relevance of our results for managers and suggesting questions for future research.

STUDY 1A: THE EFFECT OF OPPORTUNITY COST SALIENCE ON WILLINGNESS TO PURCHASE

In the first study, we tested whether a buy/no buy purchase decision can be influenced by a minimal reminder to consider opportunity costs—specifically, by framing “not buying” as “keeping money for other purchases” (without suggesting any particular use of the money). If opportunity costs are spontaneously considered, this frame should have no effect. However, we hypothesize that opportunity costs are routinely neglected and that this frame will diminish interest in a focal purchase.

Method

One hundred and fifty students at Arizona State University were asked to imagine they could purchase a DVD for \$14.99. As shown in figure 1, each was randomly assigned to one of two conditions in which the decision against purchasing was worded either as “Not buy” or “Keep the \$14.99 for other purchases.” The two descriptions are, of course, normatively equivalent, since “not buying” implies keeping the money for other purchases.

Results and Discussion

Although the principal reason against purchasing an entertaining video (or any other good) is presumably to save the money for something else, describing the “Not buy” option as “Keeping money for other purchases” caused willingness to purchase to fall from 75% to 55% ($\chi^2(1) = 6.57, p < .05$). We found similar results for choices involving a dinner event or a pair of sunglasses. Such manipulations should have no effect if participants spontaneously

FIGURE 1

STUDY 1A

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 video. This video is one with your favorite actor or actress, and your favorite type of movie (such as a comedy, drama, thriller, etc.). This particular video that you are considering is one you have been thinking about buying a long time. It is available at a special sale price of \$14.99.

What would you do in this situation? Please circle one of the options below.

(A) Buy this entertaining video

(B) Not buy this entertaining video **[Keep the \$14.99 for other purchases]**

considered outside goods before rendering their decisions, and thus this provides some evidence that they do not.

STUDY 1B: OPPORTUNITY COST SALIENCE ENHANCES PREFERENCE FOR THE CHEAPER OPTION

The prior study showed that opportunity cost cues increased the likelihood of declining a single option, when only one was offered, suggesting that choosers might have failed to consider forgone opportunities without prompting. Single-option choices may indeed be special in that the choice context fails to evoke comparisons (Jones et al. 1998). When one chooses among several options, however, it is clear that selecting one necessitates forgoing others. This could remind decision makers of opportunity costs more broadly—that is, if I am giving *this* up, what else might I be giving up?—and hence render additional opportunity cost cues redundant. We test this in the next study.

Method

As part of a short Web-based questionnaire, 196 participants were asked to choose between purchasing one of two iPods or declining both. For half of the participants ($n =$

97), the price difference between the two iPods was left implicit; for the other half ($n = 99$), we added the phrase “leaving you \$100 in cash,” as shown in figure 2.

Results and Discussion

In each condition, roughly half of the respondents ($n = 51$ in both conditions) declined to purchase either iPod. However, among those who chose to purchase one, we found that merely describing the cost difference as a residual cash amount increased the choice share of the cheaper iPod from 37% to 73% ($\chi^2(1) = 12.3, p < .001$). Just mentioning the cost savings seems to encourage participants to consider alternate uses of that money that they overlook when the difference is left implicit, thereby making an additional \$100 seem too steep a price to pay for the enhanced features of the more expensive option.

These results might be understood as a demand effect if participants regarded the mention of residual cash as a suggestion that frugality is important or that they should avoid unnecessary expenditure. To test this account, we ran a similar study in which respondents rated the importance of being frugal, the amount of guilt they would experience purchasing the more expensive alternative, and how frivolous such a purchase would be. Although our opportunity cost reminder replicated the effect discussed

FIGURE 2

STUDY 1B

Select the option you would prefer.

Option A: A 32 Gigabyte iPod touch for \$399

Option B: A 16 Gigabyte iPod touch for \$299 **[leaving you \$100 in cash]**

Option C: Not buy either iPod.

above, these additional measures showed no differences between conditions (t 's < 1).

STUDY 1C: OPPORTUNITY COST SALIENCE IN CONSEQUENTIAL CHOICE

Our first two studies involved hypothetical choices, and thus they may not have commanded as much consideration as participants would devote to a consequential choice, which could foster consideration of opportunity costs. Furthermore, consequential choices are more likely to reflect participants' preferences than their guesses about the choice that would most please the experimenter. Thus, in the current study, we apply our manipulation from the previous study to a real choice where actual money is exchanged for one of two actual mugs.

Method

Eighty-eight students at Arizona State University were each paid \$10 cash for their participation in an unrelated study. Participants were then informed that they would use the money they had just received to make an actual choice between an insulated metallic portable coffee mug for \$10 and a simpler ceramic mug for \$3.99. Half of the participants saw a description of the cheaper mug that included the phrase "leaving you with an extra \$6.01 in cash to spend on something else."

Results and Discussion

The effects observed in the first two studies persisted when real money and real mugs were at stake. When opportunity costs were brought to mind, the choice share of the cheaper mug increased from 40% to 60% ($\chi^2(1) = 3.63, p = .05$). This result suggests that our opportunity cost manipulation is not operating through experimental demand, and it casts doubt on the idea that motivation to consider the choice is a sufficient antidote for opportunity cost neglect.

STUDY 2: EXPLORING A SEGREGATION ACCOUNT OF THIS EFFECT

Study 2 focuses on an alternative account of our findings based on prospect theory. Thaler (1985) invoked the prospect theory value function (Kahneman and Tversky 1979) to propose that small amounts of money have greater impact when segregated from a larger amount in which they are embedded. He found, for example, that a pair of outcomes (losing \$200 and getting \$25) was judged to be more attractive than the combined outcome (losing \$175). In other words, \$25 has a greater impact as a separate gain than as a reduction of a larger loss. Our results could be interpreted similarly: explicitly mentioning a residual cash amount might segregate this amount from the total cost, thereby increasing the impact of the price difference and, in turn, the attractiveness of the cheaper option (e.g., $v(\$100) + v(\$299) > v(\$399)$). To test

this alternate account, we introduce here a third condition that also explicitly mentions the price difference but that does so in a way that less readily brings to mind alternative uses for money. Specifically, in a choice between two stereo systems, we added a third condition in which the phrase "spend \$300 more" was added to the description of the more expensive option, to frame the price difference as the price premium needed to purchase the superior stereo. This also segregates the price difference from the total price, but it less readily brings to mind thoughts about alternative uses since it identifies how the segregated sum will be spent (on the more expensive stereo).

If segregation explains the prior results, we would expect the choice share of the cheaper stereo to increase whether the additional cost of the expensive stereo is segregated in the form of a *premium* ("spend \$300 more") or a *discount* ("leaving you \$300"). By contrast, our opportunity cost account predicts that only the discount manipulation will influence preferences.

Method

We randomly assigned 110 MIT students in an MBA marketing class to receive one of three versions of a choice between two stereos (see below). The preamble in each case was the same: "Suppose you have just won \$1,000 playing a scratch-off lottery ticket and are shopping for a new stereo system. Check the option you would choose." The only difference was the way in which the options were described, as shown in figure 3.

Results and Discussion

The cheaper stereo was chosen more often in our standard opportunity cost condition than in either the control condition (82% vs. 59%; $\chi^2(1) = 4.47, p < .05$) or the price premium condition (82% vs. 51%; $\chi^2(1) = 8.31, p < .01$). Importantly, the price premium condition did not differ significantly from the control condition (51% vs. 59%; $\chi^2(1) = 0.47, p = .5$), which argues against a segregation interpretation.

STUDY 3: A DIRECT MEASURE OF OPPORTUNITY COST SALIENCE

Thus far, our studies demonstrate that purchase decisions are influenced by subtle frames that bring to mind opportunity costs. These findings are consistent with the notion that individuals neglect information that remains implicit while they retain the ability to recognize its relevance when the choice is framed in those terms. Since participants found opportunity costs relevant when external cues brought them to mind, they might bring them to mind spontaneously if they simply thought harder about the choice. While study 1c suggests that real consequences are not sufficient to cause participants to bring opportunity costs to mind, in this study we manipulate cognitive effort more directly by having participants record advantages and disadvantages of each option

FIGURE 3
STUDY 2

Control condition

Option A: A \$700 stereo system with a 30 watt per channel amplifier and a 5-disc CD changer.
Option B: A \$1000 stereo system with a 60 watt per channel amplifier and a 6-disc CD changer.

Price Premium condition

Option A: A \$700 stereo system with a 30 watt per channel amplifier and a 5-disc CD changer.
Option B: Spend \$300 more for a \$1000 stereo system with a 60 watt per channel amplifier and a 6-disc CD changer.

Opportunity Cost condition

Option A: A \$1000 stereo system with a 60 watt per channel amplifier and a 6-disc CD changer.
Option B: A \$700 stereo system with a 30 watt per channel amplifier and a 5-disc CD changer, leaving you \$300.

before making their decision. This procedure also provided a manipulation check of whether our opportunity cost frame does in fact increase consideration of outside goods.

Method

Two hundred and thirty-five Yale University students were randomly assigned to one of four conditions of a 2 × 2 between-subjects design that crossed our opportunity cost manipulation (whether the price difference was left implicit or was emphasized by adding the phrase “leaving you \$300 in cash”) with a cognitive involvement manipulation. Those assigned to the low-involvement conditions simply made a choice. Those in the high-involvement conditions first listed all the advantages and disadvantages they could generate for each option.

Results and Discussion

The cheaper stereo was chosen more often in the opportunity cost condition than in the control condition whether involvement was low (87% vs. 66%; $\chi^2(1) = 4.30, p < .05$) or high (86% vs. 70%; $\chi^2(1) = 6.77, p < .05$). A logistic regression revealed a significant main effect of the opportunity cost manipulation ($\beta = 1.21, p < .05$) but no effect of involvement ($\beta = 0.17, p > .6$) and no interaction ($\beta = 0.18, p > .8$). We should note that, in a separate study, we also tested whether the imposition of cognitive load (holding a long number in memory prior to choice) increased the effect of the opportunity cost manipulation. It did not.

Participants’ thought listings allow us to examine the prevalence of thoughts regarding outside goods across conditions. These thoughts were coded by two independent rat-

ers as either mentioning outside goods or not. There were very few coding disagreements, and these were resolved through discussion. Participants generated essentially the same number of thoughts in the control condition (4.04) and the opportunity cost condition (4.12, $t(71) < 1$). However, the content of those thoughts differed as expected. In the opportunity cost condition, 30% of participants mention outside goods (e.g., “I’ll have leftover money to buy CDs”; “I’ll have \$300 for shopping for clothes”) as a consideration affecting their stereo decision, as compared to just 13% in the control condition ($\chi^2(1) = 6.35, p < .05$). As further evidence that our manipulation is influencing choice by bringing to mind thoughts about outside goods, a Sobel test confirmed that the mention of outside goods was a significant mediator of stereo choice ($z = 1.6, p = .05$, one-tailed).

STUDY 4: PRIMING OPPORTUNITY COSTS

Thus far, we have shown that explicit mention of the price difference increases the share of the cheaper option, and we have proposed that it does so by encouraging consideration of outside goods. This account suggests that choices should be influenced by any procedure that brings outside options to mind. In study 4, we test another such procedure: having participants list several things they would like to buy in an ostensibly unrelated prior study.

Method

As part of a large packet of questionnaires that participants were paid \$5 to complete, 150 Yale University undergraduate students chose between a pair of cell phones, with the

higher-quality option costing \$20 more than the other option. Participants were randomly assigned to either a control condition, in which they simply chose a cell phone, or to a “priming” condition, in which the cell phone choice was preceded by a study in which they listed several items costing around \$20 that they would like to buy. This listing study was presented in a different font as part of a separate study with a different title to help mask the connection to the subsequent decision between cell phones.

Results

All participants in the priming condition listed at least one other product they would like to buy for \$20 (e.g., CDs, books, clothing). Participants in this condition chose the cheaper cell phone significantly more often (47% vs. 30% in the control condition, $\chi^2(1) = 4.11, p < .05$). This manipulation casts doubt on explanations involving experimental demand as the priming manipulation (the “listing task”) was ostensibly unrelated to the cell phone choice.

STUDY 5: INDIVIDUAL DIFFERENCES IN SENSITIVITY TO OPPORTUNITY COST CUES

We have posited that many consumers fail to spontaneously bring to mind opportunity costs when making purchase decisions. Of course, this tendency may vary across individuals. Recent studies suggest chronic differences in the extent to which consumers experience “pain” when paying for a good (Rick, Cryder, and Loewenstein 2008). We propose that this pain is determined in part by the degree to which a consumer focuses on the opportunities given up. Correspondingly, we predict that “tightwads” who experience greater “pain of paying” will be less affected by manipulations that increase the salience of opportunity costs because they are more prone to think about purchases this way without the intervention of external cues. Study 5 tests this idea.

Method

Three hundred individuals were recruited via the Internet to participate in a Web-based questionnaire. They encountered the stereo choice described earlier and received either the control condition (in which the price difference was left implicit) or the residual cash condition (in which opportunity costs were brought to mind by adding the phrase “leaving you \$300 in cash” to the description of the cheaper option). After making their choice, they completed a four-item “Spendthrift-Tightwad” scale (Rick et al. 2008) intended to characterize people according to their self-reported ease or difficulty spending money. Our hypothesis was that tightwads would be more likely to spontaneously consider opportunity costs and thus be less susceptible to our manipulation.

Results and Discussion

Using the definition provided by Rick and colleagues, we classified participants as tightwads or spendthrifts based on their composite score on the four-item measure ($\alpha > .7$). We then conducted a binary logistic regression to assess the effect of our manipulation of opportunity cost salience and participants’ score on the tightwad/spendthrift scale on participants’ choice between the cheaper or more expensive stereo. This analysis revealed a significant main effect of opportunity cost salience ($\beta = 1.51, p < .001$) and a marginally significant interaction ($\beta = .75, p = .08$). Among spendthrifts, explicit references to residual cash increased the choice share of the cheaper stereo from 41% to 87% ($\chi^2(1) = 14.7, p < .001$). By contrast, our manipulation had a smaller and statistically unreliable effect among tightwads, increasing the choice share of the cheaper stereo from 65% to 80% ($\chi^2(1) = 1.84, p > .15$). The finding that external cues to consider opportunity costs affect tightwads less than spendthrifts suggests that tightwads may be more inclined to spontaneously construe purchase decisions in terms of opportunity costs.

GENERAL DISCUSSION

Our research challenges the widespread presumption that consumers spontaneously consider opportunity costs when making a purchase decision. Frames that evoke opportunity costs reduced the likelihood of purchasing a given product (study 1a) and increased the choice share of the cheaper option (studies 1b–5). Such manipulations remained effective when the choices were consequential (study 1c) and when participants were forced to deliberate about the decision (study 3). Such effects are not readily attributable to enhanced price salience or to the segregation of the price difference from the total price (study 2) but appear instead to reflect the degree to which a particular description of the options brings to mind outside goods (study 3). Study 4 shows that priming opportunity costs affects subsequent purchase decisions even when the priming task was seemingly unrelated to the focal choice. Study 5 suggests that the efficacy of these manipulations depends on chronic spending attitudes as consumers who self-identify as “tightwads” are less influenced by frames intended to highlight opportunity costs.

Unlike the salesman’s comment in the motivating anecdote, several of our manipulations left the alternative uses of the potential savings unspecified. Although mention of any specific outside good may promote greater consideration of alternatives, estimates of opportunity cost may be affected by the particular opportunity that is mentioned. In a study not reported above, we found that the manipulation that referenced a \$300 cash savings was much less effective when accompanied by an unattractive example of how that money could be spent (specifically, a weekend trip to Des Moines, Iowa). Future research could examine how specific opportunities mentioned in a decision context differentially influence choice.

Since the consideration of opportunity costs has been shown to influence relative preferences, the effect of decision context on the accessibility of particular outside opportunities may be an important source of preference instability. In study 4, we found that the request to generate just a few uses of a specific dollar amount affected subsequent purchase decisions. In another study, we found that this task actually affected consumers' attitudes toward money, increasing their predicted reaction to finding (or losing) a \$20 bill and decreasing their willingness to take a pay cut in exchange for a more satisfying job.

Our contention that consumers often fail to consider opportunity costs might seem to contradict abundant evidence of price sensitivity. However, price sensitivity may result from many considerations other than computation of opportunity costs. The price of a product could affect consumers' evaluation of the deal relative to an adopted reference price (Thaler 1985; Weaver and Frederick 2009), their assessment of whether the ratio or difference in the prices is commensurate with the perceived differences in quality, or the amount of "pain" that accompanies expenditure. Recent neural imaging research (Knutson et al. 2007) finds that monetary losses directly activate primary rewards centers, which supports the idea that payment may have a deterrent force that requires no cognitive elaboration of the specific opportunities foreclosed by an expenditure (Prelec and Loewenstein 1998; Rick et al. 2008).

Although sensitivity to price may reflect some vague recognition of sacrifice, that need not mean that, when consumers decide whether a product is "worth it," they consider specific alternative uses for that money or attempt to simulate and compare the utility those other goods would deliver. Indeed, explicit reference to outside goods is notably rare in written protocols about purchases. Brown (2005) found that fewer than 10% of his participants mentioned outside goods when instructed to describe how they arrived at their maximum willingness to pay, we found that only 13% of participants mentioned outside goods in the control condition of study 3, and Rick et al. (2008) found only two comments resembling an explicit contemplation of opportunity costs in over 2,200 protocols regarding past purchase regrets.

While our studies may suggest that opportunity cost neglect occurs in many consumer settings, there are important boundaries worth noting. Typical purchase situations may fail to evoke considerations of outside goods because the amount of money consumers have at their disposal is quite vague and thus trade-offs are rarely explicit. In the language used by Zauberger and Lynch (2005), monetary budgets have considerable "slack"—any particular expenditure (e.g., having wine with dinner) does not unambiguously jeopardize the satisfaction of any other particular purchase goal (e.g., upgrading one's stereo system). This view of opportunity cost neglect suggests several important classes of situations where one would expect no such neglect. First, very poor individuals or those on fixed incomes may be keenly aware of opportunity costs in many decisions because their

binding budget constraints may frequently necessitate a careful comparison of mutually exclusive options. Similarly, those who budget narrowly and impose rigid constraints on the pertinent category of expenditure (see Heath and Soll 1996) may feel that they are giving something up each time they allot money to a specific purchase. The relationship between wealth, mental budgeting, and spontaneous consideration of opportunity costs is an important unexamined topic.

Some research suggests that time budgets contain more perceived slack than monetary budgets (Okada and Hoch 2004; Zauberger and Lynch 2005). Therefore, opportunity costs of time might be even less likely to be considered than opportunity costs of money—except, perhaps, by those who charge by the hour (e.g., lawyers, consultants), who may grow accustomed to converting time into equivalent revenue. Future research could examine when opportunity costs of time are spontaneously considered and how they might be externally cued.

It seems natural to assume that frames that foster the recognition of opportunity costs lead to better choices since the generation of alternatives is universally regarded as an essential component of good decision making (Hammond, Keeney, and Raiffa 2002). However, we have shown that enhancing the salience of opportunity costs will tend to dissuade consumers from selecting the higher-quality, more expensive alternative—a decision they rarely regret (Frederick 1998; Kivetz and Keinan 2006). This phenomenon is hinted at by the tagline on a long-running commercial for Acura automobiles: "Paying for quality can be a difficult decision at first, but over time it gets a lot easier to live with." We agree with Acura's descriptive claim but not its normative tone. The fact that consumers do not regret spending a lot of money does not mean that they should not regret it. As noted by Gilovich and Medvec (1995) in their landmark article on regret, the passage of time impedes our ability to track the cost of a previous action, and the opportunity costs of past expenditures may be neglected even more than the opportunity cost of present expenditures. Future research could explore how consideration of opportunity costs influences short-term and long-term regret and satisfaction.

Marketing Implications

Given that consumers who bring to mind opportunity costs become more price sensitive, manufacturers of less expensive brands interested in increasing price sensitivity may promote their products more effectively by reminding consumers to consider the opportunity costs of the price premium of more expensive competitors. Rather than advertising a brand's low prices in some general way (as when Pontiac advertised its vehicles with the tagline: "Your money hasn't gone this far since you lived with your parents") or emphasizing proportional or cumulative cost savings vis-à-vis some specific competitor (e.g., "20% cheaper than our leading competitor"; "Consumers have saved billions by switching to MCI"), firms may better promote low-price prod-

ucts by cueing consumers to think about the leftover cash and possible attractive uses for it. For example, Volkswagen could emphasize the economy of purchasing their vehicle in terms of the new wardrobe of clothes one would then be able to afford, perhaps illustrated by a smartly dressed driver ferrying her unstylish friends in her new Beetle. Consistent with this strategy, an advertisement for IKEA furniture depicted, on the left panel, an unhappy woman standing next to a cabinet containing a single pair of shoes. The caption beneath reads “Customized cabinet (\$1,670) + 1 pair of shoes (\$30) = \$1,700.” By contrast, the right panel depicted a woman beaming at her daughter in front of a more modest IKEA cabinet that was overflowing with shoes. The caption beneath showed the price of the cabinet (\$245) plus the price of 48 pairs of shoes (\$1,440) = \$1,685. Similarly, an ad for Sun America investments frames the cost of a diamond ring (\$13,000) as the reduction of \$60,296 from the beloved’s retirement account and urges its clients to find less expensive ways of saying “I love you.”

Our research suggests that another effective promotional tactic for less expensive brands would be to bundle their product with another good that could be purchased for the difference in price between their product and their competitor’s more expensive product. In a study not reported above, we found that bundling a cheaper stereo with a \$300 VCR made that option more attractive than a description that neither mentioned—nor constrained the use of—the \$300 price difference. Although this is a worse deal for consumers (because it effectively forces any consumer considering the cheaper option to spend \$300 on the VCR rather than on other things), it serves the function of the CDs in the motivating anecdote by dramatizing the opportunity costs of choosing the more expensive option.

Manufacturers of expensive products or premium brands need to consider how to guard against (or exploit) opportunity costs in consumer choice. In such cases, the strategy would not be to emphasize the opportunity costs of purchasing a competitor’s product but to downplay the opportunity costs of purchasing one’s own. For example, a DeBeers ad depicts two large diamond earrings and the tagline: “Redo the kitchen next year” to (misleadingly) imply that the cost of the diamonds is merely a delay in the kitchen’s renovation—something a homeowner may be inclined to want anyway. Since consumers may readily accept the offered characterization of opportunity costs, proposing small ones may be another strategy for encouraging spending. For example, relief agencies often frame requests for donations to impoverished children in terms of trivial opportunity costs (“For the price of a cup of coffee, you could . . .”). Amusingly, on one ostensibly antiwar Web site, the cost of the war in Iraq (then estimated at \$300 billion) was illustrated as the loss of nine Twinkies per American per day for a year—a rather unimpressive “opportunity cost” that could, perversely, increase support for that war.

Conclusion

One can dispute the normative issue of how much consumers ought to dwell on opportunity costs, but the descriptive phenomenon is clear: bringing to mind opportunity costs can markedly affect preferences. Our experimental results implying that opportunity costs are commonly neglected seem less surprising than the prevalence of the assumption that opportunity costs are routinely computed—that consumers routinely generate an exhaustive set of alternatives and successively simulate the utility of various combinations against the utility of the focal good whose purchase is being considered. To illustrate the implausibility of this assumption, consider the following example. Shortly after having had the stereo experience, our narrator purchased a \$3 cognac truffle, which he quickly consumed. Afterward, his friend asked him, “Was it worth the money?” Before responding, he first considered what else he could have purchased with \$3—six Snickers bars, a copy of *The Sporting News*, or a finer glass of wine with dinner. Or he could save the money—it is not much, but along with other sacrifices, maybe he could get a bigger apartment next year. He also recalled that satellite TV costs \$49 a month and that he had hardly been watching any TV lately. With the \$49 he would save, he could have all the truffles he wants. Bested by his friend’s question, recognizing that such thoughts could go on endlessly, he finally admitted, “I don’t know.”

The role of opportunity costs in decision making has relevance beyond the domain of consumer products. Excerpts from two political speeches warrant comparison. First consider the State of the Union address delivered by George W. Bush on January 29, 2002, just prior to the onset of war with Iraq: “My budget includes the largest increase in defense spending in two decades—because while the price of freedom and security is high, it is never too high. Whatever it costs to defend our country, we will pay.” Contrast this with a passage from Eisenhower’s “Chance for Peace Speech,” which he delivered on April 16, 1953, as he was leaving office: “The cost of one modern heavy bomber is this: a modern brick school in more than 30 cities. It is two electric power plants each serving a town of 60,000 people. It is two fine, fully equipped hospitals. It is some 50 miles of concrete highway. We pay for a single fighter with a half million bushels of wheat. We pay for a single destroyer with new homes that could have housed more than 8,000 people.”

Note that Bush, who was making a case for an expensive war, carefully avoided references to its opportunity costs, while Eisenhower, who was selling peace, liberally invoked them. It is now clear that Eisenhower’s speech failed to curb our nation’s military spending, but our research suggests that his rhetorical strategy has psychological force. If it cannot stop war, it might, at least, be used to increase the market share of affordable stereos.

REFERENCES

- Alchian, Armen A. (1968), “Cost,” in *International Encyclopedia of the Social Sciences*, Vol. 3, New York: Macmillan, 404–15.

- Becker, Selwyn W., Joshua Ronen, and George H. Sorter (1974), "Opportunity Costs: An Experimental Approach," *Journal of Accounting Research*, 12 (2), 317–29.
- Brown, Thomas C. (2005), "Loss Aversion without the Endowment Effect, and Other Explanations for WTA-WTP Disparity," *Journal of Economic Behavior and Organization*, 57 (July): 367–79.
- Buchanan, James M. (1969), *Collected Works of Jame M. Buchanan*, Vol. 6, *Cost and Choice: An Inquiry in Economic Theory*, Indianapolis, IN: Liberty Fund.
- Fischhoff, Baruch, Paul Slovic, and Sarah Lichtenstein (1978), "Fault Trees: Sensitivity of Estimated Failure Probabilities to Problem Representation," *Journal of Experimental Psychology: Human Perception and Performance*, 4 (August), 330–44.
- Frederick, Shane (1998), "Riskless Regret in Consumer Choice," unpublished manuscript, Department of Social and Decision Sciences, Carnegie Mellon University, Pittsburgh, PA 15213.
- Gilovich, Thomas and Victoria H. Medvec (1995), "The Experience of Regret: What, When, and Why," *Psychological Review*, 102 (2), 379–95.
- Hammond, John S., Ralph L. Keeney, and Howard Raiffa (2002), *Smart Choices: A Practical Guide to Making Better Life Decisions*, New York: Broadway Books.
- Heath, Chip and Jack B. Soll (1996), "Mental Budgeting and Consumer Decisions," *Journal of Consumer Research*, 23 (June), 40–52.
- Jones, Steven K., Deborah Frisch, Tricia J. Yurak, and Eric Kim (1998), "Choices and Opportunities: Another Effect of Framing on Decisions," *Journal of Behavioral Decision Making*, 11 (3), 211–26.
- Kahneman, Daniel and Shane Frederick (2002), "Representativeness Revisited: Attribute Substitution in Intuitive Judgment," in *Heuristics and Biases: The Psychology of Intuitive Judgment*, ed. Thomas Gilovich, Dale Griffin, and Daniel Kahneman, New York: Cambridge University Press, 48–81.
- Kahneman, Daniel and Amos Tversky (1979), "Prospect Theory: An Analysis of Decision under Risk," *Econometrica*, 47 (2), 263–92.
- Kivetz, Ran and Anat Keinan (2006), "Repenting Hyperopia: An Analysis of Self-Control Regrets," *Journal of Consumer Research*, 33 (September), 273–82.
- Knutson, Brian, Scott Rick, G. Elliot Wimmer, Drazen Prelec, and George Loewenstein (2007), "Neural Predictors of Purchases," *Neuron*, 53 (January), 147–56.
- Legrenzi, P. Vaolo, Vittorio Girotto, and Philip N. Johnson-Laird (1993), "Focusing in Reasoning and Decision Making," *Cognition*, 49 (1–2), 37–66.
- Loewenstein, George F. and Shane Frederick (1997), "Predicting Reactions to Environmental Change," in *Psychological Perspectives on Ethics and the Environment*, ed. M. Bazerman, D. Messick, A. Tenbrunsel, and K. Wade-Benzoni, San Francisco: New Lexington, 52–72.
- Loewenstein, George F. and Drazen Prelec (1993), "Preferences for Sequences of Outcomes," *Psychological Review*, 100 (1), 91–108.
- Nozick, Robert (1977), "On Austrian Methodology," *Synthese*, 36, 353–92.
- Okada, Erica M. and Stephen J. Hoch (2004), "Spending Time versus Spending Money," *Journal of Consumer Research*, 31 (2), 313–23.
- Prelec, Drazen, and George Loewenstein (1998) "The Red and the Black: Mental Accounting of Savings and Debt," *Marketing Science*, 17 (1), 4–28.
- Rick, Scott, Cynthia Cryder, and George Loewenstein (2008), "Tightwads and Spendthrifts," *Journal of Consumer Research*, 34 (April), 767–82.
- Schkade, David A. and Daniel Kahneman (1998), "Does Living in California Make People Happy? A Focusing Illusion in Judgments of Life Satisfaction," *Psychological Science*, 9 (5), 340–46.
- Slovic, Paul (1972), "From Shakespeare to Simon: Speculations—and Some Evidence—about Man's Ability to Process Information," *Oregon Research Institute Research Monograph*, Vol. 12, 10–23.
- Thaler, Richard (1980), "Toward a Positive Theory of Consumer Choice," *Journal of Economic Behavior and Organization*, 1 (1), 39–60.
- (1985), "Mental Accounting and Consumer Choice," *Marketing Science*, 4 (3), 199–214.
- Tversky, Amos and Derek J. Koehler (1994), "Support Theory: A Nonextensional Representation of Subjective Probability," *Psychological Review*, 101 (4), 547–67.
- Weaver, Raymond and Shane Frederick (2009), "Transaction Disutility and the Endowment Effect, working paper, Harvard Business School, Boston, MA 02163.
- Wilson, Timothy D., Thalia Wheatley, Jonathan M. Meyers, Daniel T. Gilbert, and Danny Axsom (2000), "Focalism: A Source of Durability Bias in Affective Forecasting," *Journal of Personality and Social Psychology*, 78 (5), 821–36.
- Zauberman, Gal and John G. Lynch (2005), "Resource Slack and Propensity to Discount Delayed Investments of Time versus Money," *Journal of Experimental Psychology: General*, 134 (1), 23–37.