

The Perceived Value of Money Depends on Irrelevant Uses

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Abstract

The economic value of a sum of money—where “money” includes limited-use resources such as gift cards, airline miles, and other mediums of exchange—is a function of the best consumption that it permits on the margin. We find that consumers’ perceived value of money deviates from this normative benchmark. In four studies, using choice and willingness-to-pay measures of value, we find that the perceived value of money not only depends on the *best alternative* but also on the *set of alternatives* that money can buy. Increasing the salience of the best alternative increases the value of money, but this effect is attenuated when the salience of the entire set increases as well. Even when all uses are salient, the value of money still varies with the value of unchosen alternatives, resulting in money that is valued less than the consumption it can buy.

For a given consumer, the value of money¹ is based on the best set of goods and services that it can buy (i.e., the set that yields the greatest utility). If the best use of an extra \$2 is a cup of coffee tomorrow that would not be purchased otherwise, then obtaining \$2 is as valuable as that cup of coffee. Even if the exact best set is not certain, the value of money is based on the expected utility of whatever the best set may be. If the best use of an extra \$2 is either a cup of coffee tomorrow or a glass of lemonade tomorrow, but those are each equally valuable, then obtaining \$2 is as valuable as in the first case even though the exact best use is uncertain. The economic value of a dollar (or any other unit of money) is the difference between the expected utility of the best bundle of goods that can be purchased including that dollar and the expected utility of the best bundle of goods that can be purchased excluding that dollar.

Money's flexibility as a medium of exchange that allows the purchase of many goods with a single medium provides clear economic benefits (e.g., by eliminating the double coincidence of wants problem inherent to barter), but the unique benefits that money provides also pose a psychological challenge: money is associated with not just its best uses, but also many less desirable uses (i.e., uses that are outside the consumption set). Given that consumers repeatedly observe the association between money and what it can buy, not just what it will be used to buy, we argue that the *set of goods*, rather than just *the marginal good*, affects the value of money in normatively inappropriate ways. One implication of this proposal is that even when the presence and accessibility of the best use of money on the margin is held constant, changing the actual or accessible composition of the rest of the set of potential uses can affect the perceived value of money.

In this paper, we examine the source of money's perceived value as a function of its set

¹ We include not only general-use money like cash, but also limited-use moneys like gift cards, airline miles, and credit card points.

of uses. We begin by discussing the role of the budget constraint in determining the normative value of money. We then provide a brief review of previous research on the value of money as perceived by the consumer and discuss why the value of a set, rather than just the best option in that set, may influence the value of money. Four studies demonstrate that the value of the set accounts for the value of money above and beyond the best use of the set. We close with boundary conditions and implications for consumers and markets.

The Budget Constraint

Money has economic value because it allows more or better consumption and more or better consumption generates higher utility. The standard economic model of how consumers value money depends on maximizing utility subject to a budget constraint. Every additional dollar relaxes the budget constraint, increasing potential consumption. The value of a dollar is therefore equal to the utility that could be gained through increased consumption by relaxing the budget constraint by one dollar. Holding constant the budget constraint, if the set of possible purchases expands to include a previously unavailable product that allows maximum utility to increase (i.e. the newly available product is better than the ones previously available), then a dollar could become more valuable. Again holding constant the budget constraint, if the set of possible purchases expands to include a previously unavailable product that does not allow maximum utility to increase (i.e. the newly available product is worse than the ones previously available), then the new item is not purchased, and a dollar's value does not change.

This utility maximization framework is considered by most to be an as-if model; consumers are not assumed to actually carry out such calculations. Our question here is not whether consumers engage in this exact type of calculation, but rather whether they act as if

money is as valuable as the best consumption it permits. If this basic principle holds, consumers should be sensitive to the marginal use of money and insensitive to other uses (or, equivalently, its average use controlling for its marginal use). Next, we review behavioral research on the value of money as perceived by consumers to situate our findings in the broader literature before discussing how the assessment of sets may influence how consumers value their money

Valuing Money

Opportunity Cost Neglect and Consideration. Spending money incurs an opportunity cost of the next best purchase that could have been made with that money. Consumers sometimes make spending decisions as if they neglect opportunity costs altogether: simply reminding consumers that money can be used to buy things other than the current focal purchase, a fact that should be self-evident, decreases purchase incidence (Frederick et al. 2009). This seems to indicate that consumers treat money as though it were without value. However, the purchase incidence of liked goods when sufficient funds are available is less than 100%, indicating that something prevents consumers from using their money even when they neglect to pay sufficient attention to opportunity costs. Money is treated as though it has some value, even if the value or the weight given to that value changes when other uses are made salient.

Medium Myopia. If money maintains some value in the absence of concrete opportunity cost consideration, where does that value originate? Much of the behavioral literature on the value of money focuses on money's nominal value as an important source of value. Consumers are susceptible to a money illusion: holding constant real prices and wages, consumers are sensitive to nominal prices and wages (Fisher 1928; Shafir, Diamond, and Tversky 1997). For example, people report that they would be happier with a large raise in a period of high inflation

than with an economically dominant small raise in a period of no inflation. If consumers focused on real consumption (the actual bundle of goods purchased) instead of the medium, they would not be sensitive to such nominal effects.

Because consumers are sensitive to nominal differences, the presence of an irrelevant medium changes behavior. Consumers will work for more units of a medium even when they will not work for the consumption or consumption possibilities that that medium permits (Hsee et al. 2003), and they will work for more units of a medium even when that medium cannot be exchanged for more consumption and are irrelevant over the long haul (van Osselaer, Alba, and Manchanda 2004). Consumers act myopically with respect to the consequences of mediums of exchange like money.

Such nominal differences affect consumer decisions when consumers switch among different currencies. When dealing with a currency that is a multiple of the consumer's familiar currency (e.g., an American consumer spending Mexican pesos, where 1 Mexican peso is worth less than 1 US dollar), the price seems more expensive than it truly is because it is a larger number, thus decreasing spending. When dealing with a currency that is a fraction of the consumer's familiar currency (e.g., an American consumer spending Euros, where 1 Euro is worth more than 1 US dollar), the price seems less expensive than it truly is because it is a smaller number, thus increasing spending (Raghubir and Srivastava 2002). If consumers use the amount in their budget as a reference point instead, the effect on spending may reverse (Werthenbroch, Soman, and Chattopadhyay 2007).

A Role for the Set of Money's Uses

What is missing from this literature is an assessment of how the value of a resource is

grounded at all. The evidence from this literature consistently indicates that nominal amounts of money and other mediums of exchange matter, such that larger numbers lead to greater judgments of value, price, or money available. Because the numerosity of the medium changes behavior, inserting versus removing a medium of exchange changes behavior. Although consumers are sensitive to nominal values, they are not completely insensitive to real value. In addition to the implausible implications of such insensitivity (e.g., a new rewards program could unboundedly increase perceived value by multiplying base units by millions, billions, or trillions), Raghurir and Srivastava (2002) and Hsee et al. (2003) explicitly propose that final value or effort is likely a weighted average of nominal and real values, and van Osselaer et al. (2004) find that large price differences outweigh the value of irrelevant points. Consumers base assessments of the generosity of others' donations on the expense of similar-sized purchases, indicating sensitivity to some potential consumption sets (Gourville 1998). In sum, previous research indicates that nominal value matters when it should not, but consumption value matters as well. Our understanding of how consumption value is assessed is thus far incomplete.

In the present work, we examine the influence of the set of goods that could be purchased on the perceived value of money. We focus on not just the marginal good, but also the other goods in the set. Because money's uses constitute a choice set, we turn to research on choice sets and product bundles to examine how consumers evaluate sets of goods, and use this research to inform our understanding of how consumers may value money.

Direct and Derived Evaluations. Money allows a selection from a very broad choice set. The value of a choice set depends on a subsequent decision that is under the control of the consumer. If a consumer plays out that decision, he could base the value of the choice set on the outcome of that subsequent decision. Alternatively, he could base the value of the choice set on

the properties of the choice set itself without considering the subsequent decision. The first approach is referred to as a *derived evaluation* whereas the second is referred to as a *direct evaluation* (Sood, Rottenstreich, and Brenner 2004). When consumers form direct evaluations of a choice set, they rely on properties of the set itself, for example, its size or variety. When consumers form derived evaluations of a choice set, they rely on properties of the option that they ultimately choose from that set, for example, its quality or price. In Sood et al.'s (2004) example, a direct evaluation of an electronics store depends on the breadth of categories offered and the number of brands offered within categories whereas a derived evaluation of an electronics store depends on the preference for the product that would ultimately be chosen.

Whether consumers use direct or derived evaluations matters. Properties of the set (e.g., flexibility, size, variety) have a stronger potential to influence direct evaluations than derived evaluations (Sood et al. 2004). Applying this research to the choice set made available through money suggests at least two ways for consumers to assess the value of money: a derived evaluation and a direct evaluation. A derived evaluation should lead to a value that is consistent with the normative value²: money is as valuable as the consumption it permits. A direct evaluation, in contrast, need not be consistent with the normative value, and properties of the set itself may influence the perceived value of money.

Direct evaluations are more myopic than derived evaluations, as derived evaluations necessitate looking past the current decision to the next decision. Consumers often exhibit decision myopia and do not look ahead to the next implied decision (Hsee et al. 1999; Miller and Shapira 2004; Tversky and Shafir 1992; van Osselaer et al. 2004). In addition to the cases of medium myopia discussed earlier, evidence from research on real options and violations of the

² Note that the normative assessment could be the result of an as-if process and need not rely on the process of a derived evaluation.

sure-thing principle illustrate the ubiquity of direct decisions. When investors have the opportunity to buy a call option (the opportunity but not the obligation to buy an investment in the future at a price that is locked-in in the present), the probability that the investment will fall short of the exercise price matters, but the extent by which it will fall short does not. If the investment falls short by \$1 or \$1,000, the option will not be exercised. Nonetheless, holding the probability of a negative outcome constant, more extreme negative outcomes lead to lower willingness to pay (Miller and Shapira 2004). Had the investors made derived evaluations instead, willingness to pay should not have been affected. In a demonstration of a violation of the sure-thing principle, Tversky and Shafir (1992) showed that even when consumers would make the same decision no matter how an uncertain outcome turns out, introducing uncertainty affects their decisions. This again is inconsistent with using derived evaluations.

In a variety of decisions, consumers apparently do not peer past the current node in their decision trees to derive evaluations on the basis of how the current decision will unfold and instead rely on a direct evaluation. What properties influence such direct evaluations?

Basis for Direct Evaluation. In evaluating products as sets of attributes (Troutman and Shanteau 1976) and bundles of products (Gaeth et al. 1991; Yadav 1994), people use a weighted average across multiple components to come to a judgment about the composite. Such averages describe evaluations even in cases in which the averaging strategy is unambiguously inappropriate. When both items provide positive utility, an add-on may decrease the perceived value due to averaging. Including less valuable options in a bundle of products can decrease the overall evaluation of that bundle (Gaeth et al. 1990; Yadav 1994). Consumers judge the price of a home gym combined with a fitness video as less expensive than the home gym alone (Brough and Chernev 2012), and they judge a meal containing a hamburger and broccoli as containing

fewer calories than the hamburger alone (Chernev and Gal 2010). When evaluating sets of bets, they report higher evaluations of a single highly valued outcome than of the combination of that single highly valued outcome and a second, moderately valued outcome (Shanteau 1974; Lynch 1979).

These findings suggests that even when a normative evaluation should be a function of the sum of multiple components and greater than either individual component, individuals' evaluations are affected by the average and may be lower than the larger component. A similar result may extend to the direct evaluation of the value of money, although whereas in the bundles described above the normative value is a function of the sum of multiple components, money's normative value is a function of the best among multiple components.

We propose that consumers use direct evaluations of moneys and these direct evaluations are affected by the set of options, including irrelevant ones (i.e., ones that will not be chosen). Such an implication is of considerable importance: to the extent that consumers evaluate money via an averaging process rather than via an assessment of the marginal use, this affects how gift cards and loyalty programs should be structured and our understanding of mental budgets.

Indirect Evidence. Research on multifinal means, real options, and assortment choice provides indirect evidence that averaging may be at play. Just as consumers have multiple means to attain a single goal, there are multiple goals that may be achieved with a single means. As a means is associated with more goals, it is perceived to be less instrumental for any of them. A laser-pointer pen may be used as a writing implement or as a presentation tool, but once its laser-pointing capability has been exhibited, it is less likely to be used as a pen because it has lower perceived instrumentality for writing (Zhang, Fischbach, and Kruglanski 2007). Money is in some ways the ultimate multifinal resource: as additional uses are added, its perceived

instrumentality and value for any one may be decreased. Miller and Shapira's (2004) findings regarding real option valuation indicate that irrelevant outcomes (the investment's value when consumers would not exercise the option) influence consumers' valuation, as described above. The evaluation of an assortment decreases as the number of unacceptable products in the assortment increases (Kahn and Lehmann 1991) and decreasing the number of undesirable SKUs available can increase assortment evaluations when facings are held constant (Broniarczyk, Hoyer, and McAlister 1998). Money provides access to a broad assortment containing many unacceptable products. In some cases, such effects may be normatively defensible (e.g., due to the cost of thinking). We will examine cases where such normatively defensible processes are unlikely to be drivers.

Study Overview

In the current work, we test the extent to which irrelevant alternatives influence the value of money. In Studies 1 and 2, we hold the set of uses associated with a particular form of money (gift cards) constant. In Study 1, we show that consumers are sensitive to the value of typical uses that constitute most of the set rather than preferred uses that are relatively minor contributors to the set. In Study 2, we show that once desirable alternatives are made accessible, increasing the accessibility of less desirable alternatives decreases the perceived value of money. In Studies 3 and 4, we vary the set of uses. We make all options explicit and salient and show that money's value decreases as alternative uses decrease in value, holding constant the end use. Further, we show that this can lead the value of money to be less than the value of its best use, ruling out option value as an explanation. We close with a discussion of boundary conditions and implications.

STUDY 1: BOOKS, MUSIC, AND BARNES & NOBLE

A gift card is as valuable as the consumption that it permits. However, the best use may be from a subcategory that is not representative of the entire set of purchase possibilities. In this study, we examine how a gift card's value depends on the evaluation of a dominant subcategory that is typical of the overall set and on the evaluation of a different subcategory that is not, depending on whether consumers would prefer to purchase from the dominant more-typical subcategory or the other less-typical subcategory. We use a well-known retailer with offerings that span multiple categories but is positioned more in line with some subcategories than others. We ensure that knowledge is not the key determinant by informing all participants of both the more-typical and less-typical subcategories in advance.

Method

Participants and Design. Participants ($N = 300$ from Amazon Mechanical Turk, 129 women, median age of 29) participated in a study about gift cards. All participants were informed that Barnes & Noble sells books, eBooks, music, DVDs, and Blu-ray discs among other products and answered a variety of questions in which they evaluated and made decisions about different gift cards. Barnes & Noble is positioned primarily as a bookseller, with books and ebooks taking precedence over other categories in promotional materials. A separate sample of participants reported that books and ebooks are very good examples of the types of goods Barnes & Noble sells ($M = 6.42$, $SD = 1.02$ on a 1 to 7 scale) whereas music and movies are less good, though not bad, examples ($M = 4.78$, $SD = 1.66$, $t(302) = 13.82$, $p < .0001$).

We examined how two measures accounted for variance in the value of a Barnes &

Noble gift card. In particular, we examined how a participant's value of books and ebooks (the more-typical subcategory) and the participant's value of music and movies (the sometimes-preferred but less-typical subcategory) predicted the value of money (the gift card). To test this, we measured four key pieces of information:

Money Value was assessed by having each participant make ten pairwise choices between a \$25 Barnes & Noble gift card and another \$25 gift card. Participants were asked: "Which gift card would you prefer to receive?" and were given choices of "\$25 Barnes & Noble gift card" or "\$25 [other merchant] gift card". There were ten such choices (Apple, Banana Republic, Bed Bath & Beyond, Crate & Barrel, J.Crew, Macy's, Nordstrom, Pizza Hut, Sears, Staples) in random order with one choice per page. The sum of the number of times the Barnes & Noble gift card was chosen is our measure of money value (ranging from 0 to 10), where the Barnes & Noble gift card is a form of limited-use money.

Book Value was assessed by asking participants to report their strength of preference between \$20 in cash and a \$25 gift card to Barnes & Noble that could only be used to purchase books and ebooks. This unnumbered seven-point scale ranged from "Strongly prefer \$20 in cash" (1) to "No preference" (4) to "Strongly prefer \$25 books and ebooks gift card" (7).

Media Value was similar to *Book Value*, except the focal gift card could only be used to purchase music and movies instead of books and ebooks.

Best Use was assessed by asking participants to report "If you had a \$25 gift card to Barnes & Noble, on which category below would you be more likely to use it?" They were given response options of "books and ebooks" and "music and movies". After reporting its use, participants reported what specific products they would buy with the gift card.

Participants were randomly assigned to complete the tasks in one of two orders. Those in

the “Specify First” condition first reported Gift Card Use, then Money Value whereas those in the “Value First” condition first reported Money Value, then Gift Card Use. All participants then completed Book Value and Media Value in randomized order.

We also measured confidence in their choice of subcategory (ranging from 1 = “Not at all confident” to 7 = “Very confident”), pre-study awareness of different categories of Barnes & Noble products, and the Generation subscale of the Elaboration on Potential Outcomes³ scale (Nenkov, Inman, and Hulland 2008). Finally, all participants reported sex, age, and ethnicity.

Results

We propose that money’s value is determined by the set of goods that the gift card could buy rather than by its best use. If some uses (e.g., books and ebooks) are better examples of the set than others (e.g., music and movies), preference for the typical uses may be a more important driver of gift card value than preference for the other, less-typical uses, even if those other uses better capture how the gift card will actually be used. Although we did not measure typicality directly in this study, awareness results were consistent with the pretest reported above: 99% of participants stated that they were aware that Barnes & Noble sold books before the study began and 94% were aware that they sold ebooks, but only 87% and 85%, respectively, stated that they were aware that Barnes & Noble sold music and movies before the study began. (All participants were informed about Barnes & Noble’s offerings at the beginning of the study.) If books better describe the set of goods, we predict the preference for books will be a driver of the value of money even if the gift card is going to be used on media instead.

Indeed, the value of a Barnes & Noble gift card (i.e., the value of money in this study)

³ We report individual difference measures we collected throughout. As they did not have consistent significant effects, we do not dwell on them further.

was determined by the value of the use that better describes the set (i.e., the value of books) and not by the value of its best use. To test this, we regressed Money Value on mean-centered Book Value, mean-centered Media Value, and each of their interactions with contrast-coded Best Use (1 = books, -1 = media). The only significant predictor was Book Value. See Table 1A.

	B	SE	t	p
Intercept	7.56	0.24	30.91	<.0001
Best Use	0.14	0.24	0.56	0.58
Book Value	0.40	0.13	2.99	<.01
Media Value	-0.09	0.10	-0.85	>.3
Best Use x Book Value	-0.07	0.13	-0.55	>.5
Best Use x Media Value	-0.00	0.10	-0.03	>.9

Table 1A. Study 1 results.

	B	SE	t	p
Best Use is Books				
Book Value	0.33	0.07	4.95	<.0001
Media Value	-0.09	0.09	-0.97	>.3
Best Use is Media				
Book Value	0.47	0.26	1.82	<.07
Media Value	-0.08	0.09	-0.47	>.6

Table 1B. Study 1 simple slopes.

This is not due to a lack of power to detect an interaction. Examination of the simple slopes is consistent: Book Value predicted Money Value both for those for whom the Best Use was books and for those for whom the Best Use was media (though this was a minority of participants and thus exhibited a larger standard error). Media Value, on the other hand, was significant for neither group⁴. Alternative specifications provide concurring results: the value of the money was determined by the value of the typical use, not by the value of the best use⁵⁶.

⁴ In a replication, the effect of media value for the media best use group was significantly positive. However, book value for the media best use group is the key test and was also positive and significant in the replication.

⁵ There is a non-significant trend for value of money for those who chose the less typical use, media, to be higher in the Specify First condition compared to the Value First condition ($M = 7.25$ vs. 6.30 , $p = .11$), but not for those who chose the more typical use, books ($M = 7.85$ vs. 7.83 , $p > .9$). This was also consistent in the replication ($p < .1$).

⁶ There was also a marginal three-way interaction of Best Use and Media Value with Order such that for participants who first indicated how they would spend their gift card, the coefficient on Media Value was marginally significantly *negative*. As this was highly unexpected, only marginally significant, did not replicate, and not robust to alternative specifications (e.g., when Book Value was removed from the model), we do not consider it further.

To summarize, even for consumers who are going to use a Barnes & Noble gift card on music and movies, their valuation of the gift card appears to be driven by Book Value. Some of these consumers had even considered their potential media purchases in depth immediately before evaluating the gift card. Although this study makes it impossible to judge value against a normative benchmark, we can say that the evaluation of the typical members of the set were related to money value above and beyond any relationship (in this case, no relationship) with the evaluation of the best use.

STUDY 2: BEST USE AND OVERALL SET ACCESSIBILITY

In Study 2, we use a discrete choice experiment to examine how the value of money (as revealed through choice) varies as a function of salient uses. To maintain money's fundamental properties while varying the particular associations, we operationalize money as \$10 gift cards and vary consumers' focus on best uses and the overall set. Unlike Study 1 in which we measure best use value and set value, in Study 2 we manipulate best use salience and set salience. To the extent that consumers do not spontaneously consider the best use but are sensitive to average value, increasing the salience of the best use will increase value (and hence choice) whereas increasing the salience of both the best use and the set will attenuate this effect.

Method

Design and Stimuli. We examined how gift card value would vary depending on whether consumers thought about the overall set of options and whether they thought about the options they would most like to purchase. The design was a 2 (Best Use Salience: High, Low) x 2 (Set

Saliency: High, Low) within-subject design. The first independent variable, Best Use Saliency, was operationalized by having participants respond to the prompt “What items at [merchant] are you most interested in purchasing?” in the high saliency condition and not in the low saliency condition. The second independent variable, Set Saliency, was operationalized by having participants respond to the prompt “How would you explain what [merchant] sells to someone who has never been there?” in the high saliency condition and not in the low saliency condition.

The dependent variable, the relative value of money, was operationalized as differences in utility between different \$10 gift cards, scaled into dollars. There were eight gift cards in all, divided into four pairs: a) Sears and Kmart; b) Gap and Old Navy; c) Red Lobster and Olive Garden; d) Marshalls and T.J.Maxx. One pair was assigned to each of the four conditions, with assignment of gift card pair to condition varying across participants according to a Latin square design. Participants chose one gift card from each of 16 sets. Gift cards each had a face value of \$10 and were priced between \$4 and \$9 in \$1 increments. Each choice set had three gift cards and included a no choice option; see Figure 1. Sets varied across participants; no two gift cards from the same pair appeared in the same choice, nor did two gift cards at the same price level. As we are interested in the value of each gift card from an absolute perspective, including a no choice option encourages participants to evaluate the gift cards in an absolute sense rather than a relative sense (Parker and Schrifft 2011).

If these \$10 gift cards were your only options, which gift card would you choose?
Choose by clicking one of the buttons below:
(2 of 16)

 Marshalls Shop On.	 GIFT CARD Red Lobster Come see what's fresh today.	 OLD NAVY OLD NAVY	NONE: I wouldn't choose any of these.
\$6	\$7	\$8	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 1. Sample choice from Study 1.

Procedure. Participants ($N = 100$ from Amazon Mechanical Turk, 50 women, median age of 30) responded to, in order: 1) the Best Use prompt for the Best Use Salience High / Set Salience High gift cards; 2) the Best Use prompt for the Best Use Salience High / Set Salience Low gift cards; 3) the Set prompt for the Best Use Salience Low / Set Salience High gift cards; and 4) the Set prompt for the Best Use Salience High / Set Salience Low gift cards. Participants completed 16 hypothetical choices and ended by completing the elaboration on potential outcomes scale (Nenkov et al. 2008), the propensity to plan for the short-run use of money scale (Lynch et al. 2010), reported which, if any, merchants they were unfamiliar with, and reported sex, age, and open-ended comments.

Results

Because the manipulation of best use may backfire for unfamiliar merchants, we only examine choice sets where participants were familiar with all merchants in that choice⁷. We analyzed the data using a mixed logit analysis, allowing correlated random effects for each gift card; alternative specifications are consistent. We compared Best Use Salience High / Set Salience Low (“Best Use Only”) to each of the other conditions. Gift cards in the Best Use Only condition were significantly more valuable than those in any other condition. Dividing by the price coefficient places a dollar value on this comparison. Best Use Only gift cards were valued \$2.07 more than gift cards for which no uses were made salient ($t = 4.57$; $p < .0001$); \$1.60 more than gift cards for which the set alone was made salient ($t = 3.64$, $p < .001$); and perhaps most importantly, \$1.27 more than gift cards for which both the set and the best use were made salient ($t = 2.94$, $p < .01$).

⁷ We elected to make these exclusions on a choice-by-choice basis to reduce the amount of data loss. If we instead consider only participants who were familiar with all eight merchants (and thus had no excluded choices), the results strengthen further.

Note that no new information was provided in the prompts; participants generated uses themselves. Not only did generating the best use increase the perceived value more than generating the set of uses, but considering the set of uses in addition to the best use decreased perceived value, providing evidence for an averaging model.

Discussion

In Studies 1 and 2, consumers valued gift cards according to the set of goods that are salient rather than the best good(s) in that set. In Study 1, participants valued a gift card according to its set of goods when that set was directly related to how the merchant is positioned. In Study 2, participants valued gift cards more when they focused exclusively on what they would be most interested in buying than when they focused on both what they would be most interested in buying and the overall set of goods. This may suggest why the effect of the manipulation in Study 1 on the value of money for those who would have chosen media rather than books was not significant: the overall set, dominated by books, was so accessible that it influenced values even when the manipulation increased the accessibility of the best use.

It is worth noting a key distinction between the current findings and research on opportunity cost neglect and consideration (Frederick et al. 2009; Spiller 2011). Opportunity cost neglect suggests that consumers would not consider alternative uses of their money. Both the Specify First condition in Study 1 and the Set High Salience conditions in Study 2 encourage consumers to consider their opportunity costs. Spiller (2011) found that increasing the accessibility of alternative uses increases opportunity cost consideration and, if those uses are highly valued, decreases spending. But that work does not speak to the effect of increasing the salience of both the set of uses and a highly valued use, as was tested in Study 2.

These results show the effect for real moneys with large, non-enumerated sets of offerings. One disadvantage is that they do not allow for consideration of the absolute value of the money: is the money undervalued when the set is considered or overvalued when just the best use is considered? In Studies 3 and 4, we construct novel dual-use moneys and measure value of the moneys (through willingness to pay in dollars) and of its best uses. Although these moneys are artificial, they allow us to test whether the perceived values are too high or too low.

Studies 3 and 4 also allow us to conclusively rule out inaccessibility of the best use as a possibility. Spiller (2011) found that consumers were more likely to spend their money when highly valued alternatives do not come to mind, whereas the present research addresses when both highly valued and less highly valued alternatives do come to mind. In Study 1, we reminded consumers of Barnes & Noble's offerings and encouraged some of them to consider what they would most like to buy before deciding, yet they were still sensitive to the value of the set rather than just the best use. In Study 2, encouraging consumers to consider the set in addition to the best use decreased the value of money compared to just considering the best use. By making all alternatives explicitly and externally available during the valuation process in Studies 3 and 4 (something that would be impossible with a non-enumerated set), we further rule out inaccessibility of preferred uses as a plausible account.

STUDY 3: DUAL-USE MONEYS

Method

Participants in this study ($N = 101$ from Amazon Mechanical Turk, 47 women, median age of 32) read brief descriptions of four different products (a 16-week subscription to The

Economist, a 2-month subscription to Beats Music, two AMC movie tickets, and a travel coffee mug) and were informed that each product was sold at a price of \$25 or less.

We measured three key sets of information from each participant:

Product Value (four items): we measured willingness to pay for each of the four products using a slider that ranged from \$0 to \$30.

Gift Certificate Value (six items): we measured willingness to pay for each of six gift certificates, also using a slider that ranged from \$0 to \$30; each gift certificate could be used to buy one of two products. For example, one gift certificate could be used to buy either two AMC movie tickets or a travel coffee mug. The six gift certificates encompassed all pairwise combinations of the four products.

Best Use (six items): we measured which product participants would use each gift certificate to buy.

Each measure was taken twice to reduce error variance (in Product Value and Gift Certificate Value measures) and to identify inconsistent choices (in Best Use measures). The 10 items from Product Value and Gift Certificate Value were presented (one per page) twice, each in a randomized block, for a total of 20 items. Next the Best Use items were presented twice in a single randomized block. For Gift Certificate Value and Best Use, position was counterbalanced. We consider only the 87 participants who chose the same product for each gift certificate both times they were asked. (The remaining 14 participants have at least one choice on which they were inconsistent, meaning that it is impossible to assess the best use for that gift certificate.)

Using these measures, we calculated our measures of interest. The unit of observation was the gift certificate, with six observations per participant. For each observation, we consider four values.

Money Value: The value of money was calculated as willingness to pay for the gift certificate, averaged across the two measurements of Gift Certificate Value. In this study, the gift certificate is the money, willingness to pay represents the value.

Chosen Value: The value of the chosen option was calculated as willingness to pay for the product chosen as the Best Use for each gift certificate, averaged across the two measurements of Product Value.

Unchosen Value: The value of the unchosen option was calculated as willingness to pay for the product not chosen as the Best Use for each gift certificate, averaged across the two measurements taken of Product Value.

Other Value: The value of the other options that could not be purchased with the gift certificate was calculated as willingness to pay for the two products that the gift certificate could not be used to buy, averaged across the two products and the two measurements taken of Product Value.

Finally, participants reported short-run propensity to plan for the use of money (Lynch et al. 2010) and demographics.

Results

Of the 101 participants, 14 exhibited inconsistent choices (e.g., once they chose the coffee mug over the tickets and once they chose the tickets over the coffee mug). Given that there were 6 pairs of choices, this is a relatively stringent test, and is indicative of attentive participants. The 87 consistent participants, with 6 observations each, result in 522 observations. We examined Money Value as a function of Chosen Value, Unchosen Value, and Other Value. Our key hypothesis tests whether Unchosen Value predicts Money Value above and beyond

Chosen Value. Other Value tests whether this effect is distinct to money uses and unrelated to items outside of that possible set. Normatively, Money Value should only be predicted by Chosen Value; conditional on Chosen Value, Money Value should be unrelated to Unchosen Value, but we hypothesize that it will be positively related.

We include subject fixed effects and cluster-robust standard errors to account for non-independence. If there are individual differences in WTP, these will be accounted for by the fixed effects. We also include gift certificate fixed effects to account for any idiosyncracies to these particular gift certificates. Results are robust to alternative analysis plans (e.g., individual-level regressions lead to the same overall conclusions).

Results are given in Table 2. Not surprisingly, the coefficient on Chosen Value is strong and positive: as Chosen Value increases by \$1.00, Money Value increases by \$0.70. More importantly, the coefficient on Unchosen Value is also strong and positive. Holding Chosen Value constant, as Unchosen Value by \$1.00, Money Value increases by \$0.11. Conditional on Chosen Value and Unchosen Value, Other Value is unrelated to Money Value.

	Estimate	SE	t (427)	p
Chosen	0.702	0.051	13.71	<.0001
Unchosen	0.112	0.037	3.02	<.01
Other	-0.009	0.047	-0.19	>.8

Table 2. Study 3 results.

Could this result be driven by option value? If consumers were unsure about how they would use the gift certificate, then a better less-preferred option may result in higher Money Value than a worse less-preferred option because there is some chance they might purchase the currently less-preferred option. Conceptually, this should be unlikely as we only include participants who made consistent choices of how to use all of their gift certificates (and were thus relatively certain of their choice), and the choice of how to use the gift certificate

immediately followed the valuation task.

Our data rule out option value as a viable explanation. Option value can lead Money Value to be greater than Chosen Value to a greater or lesser extent; for a terrible less-preferred option that would never be preferred to the more-preferred option, Money Value should be equal to Chosen Value. Yet if Money Value is driven by both Chosen Value and Unchosen Value as we propose via an averaging process, Money Value may be *less* than Chosen Value⁸.

For observations where Unchosen Value equals or exceeds Chosen Value, neither our averaging account nor the option value account suggests Money Value is less than Chosen Value. Where Unchosen Value is lower than Chosen Value, the option value account predicts Money Value must still be equal to or greater than Chosen Value, whereas the averaging account predicts Money Value will be less than Chosen Value. Indeed, across those observations (averaged per participant across participants), we find that the Money Premium is negative ($M = -0.93$, $SD = 2.01$; $t(81) = -4.21$, $p < .0001$)⁹. When consumers value the chosen product more than the unchosen product, they value their gift certificate less than its final use, indicating both that our results cannot be driven by option value and that poor irrelevant options can actually reduce the perceived value of money.

STUDY 4: SPECIFYING USES FOR DUAL-USE MONEYS

If participants value money based on direct evaluations of their resources, then encouraging them to specify how they will use their resources may encourage them to use a

⁸ Situations may exist where averaging may be combined with a preference for flexibility, potentially leading Money Value to be valued more than Chosen Value.

⁹ Regression to the mean may pose a slight concern, but multiple robustness checks indicate it does not account for the effect. See Appendix for details.

derived evaluation instead and be less influenced by the value of other alternatives in the set. In Study 4, we test the role of first specifying how money will be used in assessing its value.

Method

Study 4 used the same method as Study 3, except that participants ($N = 301$ from Amazon Mechanical Turk, 131 women, median age of 30) were randomly assigned to one of two conditions: they either valued the products and gift certificates before specifying how they would use the gift certificates (*Value First*, as in Study 3), or they specified how they would use the gift certificates before valuing the products and gift certificates (*Specify First*). Rather than completing the short-run subscale of propensity to plan for money, participants completed the Generation subscale of the Elaboration on Potential Outcomes scale (Nenkov et al. 2008).

Results

We again examine participants with all consistent choices ($n = 248$), resulting in 1488 observations. Again, we account for non-independence using fixed effects and cluster-robust standard errors. Results are given in Table 3A below, where Order is coded such that 1 = Specify First and -1 = Value First. Note that the main effect for Order is excluded because participant fixed effects are included in the model.

	Estimate	SE	t(1229)	p
Chosen	0.697	0.034	20.69	<.0001
Unchosen	0.209	0.024	8.84	<.0001
Other	0.042	0.032	1.31	>.15
Chosen*Order	0.019	0.031	0.61	0.545
Unchosen*Order	-0.060	0.024	-2.55	<.05
Other*Order	-0.032	.026	-1.22	0.22

Table 3A. Study 4 results.

	Estimate	SE	t(1229)	p
Value First				
Chosen	0.679	0.047	14.57	<.0001
Unchosen	0.270	0.035	7.65	<.0001
Other	0.074	0.047	1.58	>.1
Specify First				
Chosen	0.717	0.045	15.88	<.0001
Unchosen	0.149	0.032	4.72	<.0001
Other	0.010	0.035	0.28	>.7

Table 3B. Study 4 simple slopes.

Money Value is strongly related to Chosen Value, and this relationship does not depend on whether value is specified first or not. The relationship between Unchosen Value and Money Value is stronger when participants did not first specify how they would use the money, as indicated by the significant Unchosen * Order interaction. However, even when participants first specified how they would use the money, controlling for Chosen Value, a \$1.00 increase in Unchosen Value was associated with a \$0.15 increase in Money Value; see Table 3B for simple slopes. Although the relationship is attenuated, it is not eliminated even when the chosen option is as salient as the unchosen option (unlike Studies 1 and 2).

As in Study 3, we also examine the Money Premium. Using the same analysis plan, we again find that the Money Premium is negative ($M = -0.64$, $SD = 2.25$, $t(244) = -4.48$, $p < .0001$) across all observations where Chosen Value exceeds Unchosen Value¹⁰. Surprisingly, the Money Premium does not differ between conditions ($p > .5$). This can be explained by small shifts in product values. There was a non-significant increase in willingness to pay for the chosen option and a non-significant decrease in willingness to pay for the unchosen option in the Specify First condition compared to the Value First condition. Even though the influence of Unchosen Value decreased, Chosen Value increased without a fully matched increase in Money Value, leaving the magnitude of the Money Premium effectively unchanged. Although the bias was unaltered,

¹⁰ Again, robustness checks indicate this is not explained by regression to the mean. See Appendix.

specifying how they would use the gift card did increase the precision of values. The average absolute error ($|\text{Money Value} - \text{Chosen Value}|$) was smaller in the specify first condition than in the value first condition (raw: $M_{\text{SpecifyFirst}} = 1.44$, $M_{\text{ValueFirst}} = 1.90$, $t(246) = -1.91$, $p < .06$; logged: $M_{\text{SpecifyFirst}} = 0.71$, $M_{\text{ValueFirst}} = 0.88$, $t(246) = -2.32$, $p < .05$).

GENERAL DISCUSSION

Across four studies, we find that consumers' perceived value of money depends on the set of uses available rather than just the best use. This result holds with small sets and limited use moneys (Studies 3 and 4) as well as non-enumerable sets constituting a retailer's entire offerings (Studies 1 and 2). This result also holds when the set itself is varied (Studies 3 and 4) or when the accessibility of the set is varied (Study 2). The relationship with irrelevant uses can be attenuated when consumers first specify how they will use their money, but the relationship is not eliminated (Study 4). Multiple measures of value (choice in Studies 1 and 2 and willingness to pay in Studies 3 and 4) provide convergent evidence for this effect. Money can be valued less than the goods it would be used to buy, as suggested in Studies 1 and 2 and shown in Studies 3 and 4.

Reconciling Results

The results reveal a consistent pattern across studies. Nevertheless, a few deviations from that pattern provide an opportunity for a more complete understanding of how the set's value is integrated into money's value. First, why did the manipulation of order in Study 1 fail to increase the correspondence between the value of money and the value of the best use for participants

who planned to purchase a less typical product (music and movies)? There was a non-significant trend such that encouraging participants to focus on their best use of the gift card tended to increase the value of the gift card when their best use was not typical of the set. Yet, for those participants, there was no across-participant relationship between value of music and movies and value of money. In Study 2, increasing the salience of the rest of the set in addition to the best use reduced the perceived value of money. Given the strong association of the merchant in Study 1 (Barnes & Noble) with the typical subcategory (books and ebooks), that subcategory may have been sufficiently salient to reduce the effect of the focusing manipulation.

Second, why did the manipulation of order in Study 4 fail to reduce the magnitude of the negative money premium? This may be due to the non-significant effect on Chosen Value. When consumers first specified their use, although the magnitude of the negative money premium did not shrink, the average absolute error did and the number of exact predictions (where absolute error = 0) increased.

Boundary Conditions

There are important boundary conditions to our findings. First, we expect that the averaging effect will be reduced when the comparison is transparently dominant. If the products we used in Studies 3 and 4 were (a) four free movie tickets; (b) three free movie tickets; (c) two free movie tickets; and (d) one free movie ticket, we expect our findings would not hold, as the dominated options may be trivially edited out. Whether consumers believe the relationship is dominant or not may be an important moderator. Some consumers might believe that a \$20 bill strictly dominates a \$20 Starbucks gift card, whereas others may question the convenience of paper money if they plan to make daily Starbucks purchases anyways.

Second, because of the need to manipulate the set of options, we have considered limited-use moneys rather than cash or credit. We expect the general principles to apply when using cash or credit as well, though important questions remain. First, when using cash or credit the best use may not come to mind at all (Weber and Johnson 2006; Frederick et al. 2009; Spiller 2011). Under conditions where subsets of options do come to mind (Spiller 2011), the present research indicates that it is not the best use that will determine the value of money. We posit that the value of money is likely learned over time, so that even if no subset of options is particularly salient, the set of potential uses encountered in the past provides a likely basis for valuation. Second, there are important situations when money does have specific categories of uses associated with it, such as in the case of mental accounts and mental budgets (Heath and Soll 1996; Henderson and Peterson 1992; Thaler 1985). Our findings indicate that consumers may value money within a mental budget according to its average value. We expect such mental budgets to exhibit properties like the gift cards in studies reported above.

Consumer Implications and Future Research

The present work has key implications for understanding consumer behavior. First, there are direct implications for how consumers value and use their money. Undervaluing money can lead to a vicious cycle: if money is undervalued, products valued below the normative value of money are more likely to be purchased. Such use will increase the association of money with lower-valued products, reinforcing the undervaluation. This may lead to a stable, self-reinforcing undervaluation that is resistant to self-correction through learning.

Second, this work contributes to recent consumer research on opportunity cost consideration (Frederick et al. 2009; Spiller 2011). Reminding consumers that money has other

uses decreases purchase incidence, though purchase incidence is below 100% even in the absence of such reminders. Consumers give money some value even in the absence of opportunity cost consideration. Does reminding consumers of their opportunity costs serve to encourage them to generate best uses or average uses? In the absence of such a prompt, do consumers use a value based on the set of uses? We contend that consumers may usually use a value based on the set of goods unless prompted to consider an alternative use, in which case they rely on the better-than-average value derived from the retrieved alternatives. This dual approach to the value of money (a generalized value in the absence of concrete opportunity cost consideration, a specific one in its presence) could benefit from further research.

Market Implications

Finally, the present results have concrete implications for marketers and market outcomes. From all four studies, we see that limiting gift card uses to a subset of products may increase their value to the consumer. This is sometimes discussed in the context of precommitment devices, but even when precommitment is not an issue, there may still be benefits. The present results suggest that Sears Tools and Sears Kitchen gift cards may be perceived as more valuable by tool- and kitchen-lovers, respectively. We speculate that this may be one benefit of the category images printed on many gift cards: the images increase the salience of subsets of goods and thus the perceived value, even if at the expense of flexibility. Similarly for loyalty programs, consumers may benefit from having points that go to a limited-use account (e.g., hotels or flights) rather than an undifferentiated account.

Second, our results can help to account for pricing anomalies observed in the marketplace. There is a robust market for secondhand discount gift cards. Within these markets,

economically equivalent gift cards are often offered at different discounts even though the vendors themselves provide information that they are equivalent¹¹. For example, Sears and Kmart gift cards are economically equivalent because a Sears gift card may be used to make purchases at Kmart as well as Sears and vice versa. There are multiple drivers (e.g., consumers might be unaware of such equivalences even though the vendors often make them explicit, or consumers might be embarrassed to use a Kmart gift card at Sears), but a post-test indicates the account based on averaging across salient uses may be a contributing factor.

We examined willingness to pay of 201 participants for 15 \$50 gift cards, including 5 pairs of economically equivalent gift cards (like Sears / Kmart). For some participants, the economically equivalent gift cards were shown on the same screen, meaning that if consumers thought they should pay the same amount for each gift card, they could do so easily. For other participants, the economically equivalent gift cards were shown on different screens, meaning that even if consumers thought they should pay the same amount for each gift card, doing so would be more difficult. For each pair, participants also reported at which of the two merchants they would prefer to shop. Even when the pairs were shown on the same screen, consumers still reported being willing to pay \$2.26 more for their preferred merchant (\$30.44 vs \$28.18; $p < .0001$). This reflects intentional differences (e.g., embarrassment, gift motives). However, when the assessments are separated and not made on the same screen so the separate salience of each set can play a stronger role, the difference is even larger (\$3.29; \$31.60 vs. \$28.31, $p < .0001$; interaction $p < .07$). Even though intentional differences contribute to differences in valuation between economically equivalent gift cards, they do not account for the full extent of the effect, suggesting averaging across salient uses may contribute to the observed price differences.

¹¹ To take one example, at the time this footnote was written, the authors could buy a \$50 Outback Steakhouse gift card for \$44.50 or a \$50 Fleming's Steakhouse gift card for \$43.50 from the same vendor, even though a Fleming's Steakhouse gift card may be used at Outback Steakhouse.

Previous behavioral research has indicated that consumers are sensitive to irrelevant properties of mediums of exchange that are wholly disconnected from their end uses. Yet the role of its consumption value has not been explored in depth. We partially unveil the nature of that relationship. Consumers may be sensitive to nominal changes, but they are not wholly insensitive to real changes. Our examination of this connection, and particularly our findings that the value of the set of uses rather than the best use alone is the key determinant of money's perceived value, helps us better understand how consumers value their money.

Appendix

We considered multiple robustness checks in Studies 3 and 4 to examine whether regression to the mean was driving our finding of a negative money premium. The concern is that if our dependent variable is the difference between Money Value and Chosen Value but we select cases for which Chosen Value exceeds Unchosen Value, we may select cases where Chosen Value may be abnormally high, leading the difference between Money Value and Chosen Value to be abnormally low. Note that if true Chosen Value is higher than otherwise expected, that is still a valid input into Money Value, as an unexpectedly high Chosen Value should lead to an unexpectedly high Money Value. In other words, selecting on shocks that are observed to the consumer is not problematic, only selecting on shocks unobserved to the consumer (e.g., measurement error, mistaken input) could cause a spurious effect. Over all observations, including those for which an averaging account would not predict a decrease, the effect averaged -0.44 ($t(86) = 2.30, p < .05$) in Study 3 and -0.12 ($t(247) = -0.85, p > .3$) in Study 4.

First, including all observations, a non-parametric Wilcoxon signed-rank test indicates that both in Study 3 ($p < .005$) and in Study 4 ($p < .005$), the distribution of gift card values is shifted to lie below the distribution of chosen product values.

Second, by selecting observations based only on a low Unchosen Value rather than a positive spread between Chosen Value and Unchosen Value, we select observations that are more likely to exhibit such a spread without selecting on a component of the dependent variable; this avoids regression to the mean. If we select the subset of participants for whom average Unchosen Value is less than or equal to \$8 (where the median is \$6.75 in Study 3 and \$7.79 in Study 4), the negative money premium holds within that subset (Study 3: $M = -0.35, t(49) =$

2.04, $p < .05$; Study 4: $M = -0.378$, $t(132) = -2.74$, $p < .01$).

Third, the effect size of the mean difference as estimated via a Bayesian t-test (Kruschke 2013) is relatively robust to outliers, because the data are modeled as being generated by a (potentially) heavy-tailed distribution. Over all observations in Study 3, the posterior mean is -0.395 with a 95% high-density interval ranging from -0.693 to -0.115, with only 0.2% of the posterior distribution of the mean lying above 0; in Study 4, the posterior mean is -0.177 with a 95% high-density interval ranging from -0.322 to -0.033, with only 0.5% of the posterior distribution of the mean lying above 0. Thus, over all observations (meaning that it cannot be driven by regression to the mean), the most likely mean that would generate our data is reliably negative in each study.

Fourth, we also selected observations based on a measure that would be related to the difference in stable value but not momentary error unknown to the participant. In particular, we select gift certificates based on the Chosen-Unchosen Value spread from the first measurement and then examine the Money Premium from the second measurement, and also select gift certificates based on the Chosen-Unchosen Value spread from the second measurement and then examine the Money Premium from the first measurement. This measure remained significant for both Studies 3 ($M = -0.74$, $t(82) = -3.18$, $p < .01$) and 4 ($M = -0.54$, $t(244) = -3.61$, $p < .001$).

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