The Costs and Benefits of Temptation in Consumer Choice

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January 2007
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Abstract

The literature on impulsive choice and self-control focuses on the costs of facing tempting choices. Resisting temptation requires willpower, whereas yielding to temptation implies a weak will. In contrast, we propose that the presence of temptation may also confer benefits. Selecting an unappealing virtue from a choice set that also includes tempting vices provides a positive self-signal (highlighting one’s ability to resist temptation) that enhances the utility of consuming the virtue. Hence, moderation and restraint are more rewarding in the presence (rather than the absence) of indulgent options. Conversely, selecting a tempting vice from a choice set that also includes unappealing virtues provides a negative self-signal (highlighting one’s inability to resist temptation) that reduces the utility of consuming the vice. Hence, indulgence is more rewarding in the absence (rather than the presence) of virtuous options. A series of five experiments shows that (1) the self-signaling value entailed by the composition of the choice set either adds to, or detracts from, the utility associated with the chosen item, and (2) these effects, in turn, affect consumer choice, including willingness to pay and preferences among the choice sets themselves. We discuss (1) theoretical implications of our findings for research on impulsive choice and self-control and on self-signaling and (2) managerial implications for pricing and assortment strategies.

Key words: Context effects; impulsive behavior; self-control; self-signaling.
“It is good to be without vices, but it is not good to be without temptations.”

Walter Bagehot (1826-77), British economist, journalist, early editor of The Economist

Temptation is costly. Fearful of the consequences of succumbing to it, consumers often limit their own access to tempting vices through precommitment and self-rationing (Gul and Pesendorfer 2001; O’Donoghue and Rabin 1999; Schelling 1984; Wertenbroch 1998). Thus, smokers often buy single packs instead of volume-discounted cartons of cigarettes to limit their availability (Wertenbroch 2003). Moreover, when faced with temptation, consumers expend willpower to resist it (Bénabou and Tirole 2004; Hoch and Loewenstein 1991; Muraven, Tice, and Baumeister 1998). Yet as the Bagehot quote suggests, temptation can also confer benefits. We explore the interplay of the costs and benefits of temptation, which arise from choosing from mixed choice sets that contain both vices (e.g., smoking, eating hamburgers, committing adultery) and not-so-tempting virtues (e.g., giving to charity, eating broccoli, reading this paper).¹ Our main proposition is that such mixed choice sets can either add to, or detract from, the utility of a chosen option.

Consider, for instance, a consumer who chooses between a less healthy but tasty candy bar (a relative vice) and a less tasty but healthy apple (a relative virtue) for a snack. We propose that, if she succumbs to the temptation and chooses the candy bar from this mixed choice set, her utility would be less than if she chose the candy bar from a

¹ Vices are goods that are tempting to consume but whose consumption may entail negative consequences in the future; virtues are goods that are tempting not to consume, although their consumption may entail positive future consequences (see Wertenbroch 1998 for a formal definition of vices and virtues in the context of self-control problems). Related distinctions in the literature have been made between affective and cognitive goods (e.g., Shiv and Fedorikhin 1999) and between hedonic and utilitarian goods (e.g., Dhar and Wertenbroch 2000).
homogeneous set without the healthy options. Conversely, we propose that she would derive greater utility from the apple when choosing it from this mixed choice set than when choosing it from a homogeneous choice set without tasty, less healthy items. The example illustrates that the costs of succumbing to temptation and the benefits of resisting temptation depend on the other options that are available in the choice set. We argue that this is because the choice context can create positive or negative self-signals that affect the utility associated with the chosen item. In other words, the presence of temptation can either decrease or increase the utility of a chosen option.

We further propose that anticipating these self-signaling costs and benefits of temptation before choosing will affect consumer preferences among choice sets themselves. For example, since the utility associated with choosing a virtue depends on the composition of the choice set, consumers who expect to choose a virtue will prefer to choose from a mixed set rather than from a virtue-only set to generate ex-post benefits of positive self-signaling.

The remainder of our paper is organized as follows. We first develop a framework for understanding the implications of the composition of the choice set for the utility associated with choosing an option characterized as a virtue or a vice. Based on a brief review of prior research relevant to self-signaling in choice, we develop our proposition that a mixed choice set can either add to, or detract from, the utility obtained from choice. Next, we test this proposition and its implications for consumer choice in five experiments using real and hypothetical choices. As illustrated in the candy bar example, we use simple choice sets with one or two alternatives to manipulate whether the chosen and the forgone options are virtues or vices. We conclude with a discussion of the
theoretical implications of our findings for research on self-control and on self-signaling and we discuss managerial implications for pricing and assortment strategies.

**CHOICE SET-DEPENDENT UTILITY FROM SELF-SIGNALING**

In standard economic treatment of utility, the utility of a chosen item is independent of the non-chosen options in the choice set (Luce 1959). In the example above, this implies that a consumer would be indifferent between choosing an apple from a heterogeneous, or mixed, choice set \{apple, candy bar\} or a homogeneous choice set \{apple, other virtues\}. Conversely, a consumer who yields to temptation would be indifferent between choosing the candy bar from a mixed choice set \{apple, candy bar\} or a homogeneous choice set \{candy bar, other vices\}. In contrast to this standard account, research on context effects shows that non-chosen options can potentially influence the utility associated with the chosen options (e.g., Huber, Payne, and Puto 1982; Simonson and Tversky 1992). We extend the notion of context-dependent utility of an option to the area of self-signaling.

Consider first the case where the individual chooses a virtue (e.g., an apple). Research on self-perception and self-signaling suggests that people infer from their choices what kind of person they are (Bem 1972; Bénabou and Tirole 2004; Prelec and Bodner 2003). Prelec and Bodner (2003) develop a theoretical model to show that self-signaling provides utility that can guide choices even though it leaves the underlying (context-independent, exogenous) preferences for the choice options unchanged. Thus, if consumers observe themselves resisting a tempting vice, an effort that requires willpower
(Hoch and Loewenstein 1991; Muraven et al. 1998), they may infer that they are blessed with such willpower and strength of character.

We posit that the utility consumers derive from such self-signaling depends not only on what a person chooses but also on what else they could have chosen. This is because counterfactual thinking about the non-chosen options that are salient will also affect the information value of the signal. For example, participants in a study attributed lower honesty to a target individual who acted honestly when there was a situational constraint against acting dishonestly (e.g., a video surveillance camera) than when there was no such constraint (Miller, Visser, and Staub 2005). Such counterfactual thinking is influenced by the presence or absence of other choice options and by the feasibility of choosing these other options. Thus, choosing an apple from a mixed choice set that also includes tempting options allows for a more positive inference than choosing the apple from a homogeneous choice set that consists of healthy items only. So the utility associated with the apple will be greater if the choice set also included candy bars. But if the tempting options in the choice set are not viewed as viable, choosing an apple has less self-signaling utility as it allows only for a limited inference of the strength of one’s will.

Consider next the case where the individual chooses a vice (e.g., a tasty but unhealthy candy bar). Many researchers have shown that the consumption of vices is associated with pleasure mixed with feelings of guilt because it violates standards consumers may have set for themselves (e.g., Khan and Dhar 2006; Giner-Sorolla 2001; Kivetz and Zheng 2006). These feelings of guilt lead to negative attributions about oneself. As stated above, we propose that these negative inferences are strengthened by the extent to which the choice context supports the self-attribution. Thus, the choice of a
vice is more diagnostic of one’s lack of willpower or character when it was chosen from a
set that also included more healthy snacks than when the choice set did not allow for the
possibility of choosing a healthy snack. However, if choosing a virtue from the choice set
is not viewed as viable, then choosing the candy bar has less self-signaling disutility as it
allows only for a limited inference of the weakness of one’s will.

A question that naturally arises is how these self-attributions affect the utility of
the chosen item. Similar to other models of context dependent utility (e.g., Higgins et al.
2003; Thaler 1985), Prelec and Bodner’s (2003) model of strategic self-signaling
suggests that choice reflects two utility components, outcome utility (i.e., the context-
independent utility of an option) and diagnostic utility (i.e., the context-dependent utility
or disutility of learning about the type of person one is as signaled by one’s choice). We
propose that consumers incorporate the value of what their choices reveal about
themselves (i.e., the diagnostic utility) into their overall utility. Extending this notion of
context dependency to the composition of the choice set, we summarize our predictions
using the following notation. The context-independent (exogenous) utility of a vice is
denoted by $v(h)$ and that of a virtue by $v(u)$. The context-dependent utility of choosing a vice from a mixed set that contains both the vice and the virtue is $v(h|\{h,u\})$. Following the same notation, $v(u|\{h,u\})$ represents the utility of choosing a virtue from a mixed set. We contrast these with $v(h|\{h\})$, the utility of choosing a vice from a homogeneous set that contains only vices, and $v(u|\{u\})$, the utility of choosing a virtue from a choice set that contains only virtues.

Our main proposition is that a vice provides more utility when it is chosen from a
homogeneous rather than from a mixed choice set, whereas a virtue provides more utility
when it is chosen from a mixed rather than from a homogeneous choice set,

\[ H_1: \quad v(h|\{h\}) > v(h|\{h,u\}), \]

\[ H_2: \quad v(u|\{u\}) < v(u|\{h,u\}). \]

Next, we present five experiments to test these hypotheses. Studies 1 and 2 demonstrate that consumers derive less utility from a vice when it is selected in the presence of virtue items. In contrast, consumers derive more utility from a virtue when it is selected in the presence of vice items. Study 3 tests the self-signaling account of this effect by providing participants with an opportunity to attribute their choice to the situation or to their own disposition. We then turn to exploring implications of our theory for pricing and choice. Study 4 shows how the difference in utility associated with the choice context is reflected in a corresponding difference in willingness to pay for vice and virtue items as a function of the choice set. Study 5 uses a temporal construal manipulation to vary the salience of the temptation inherent in a choice set, thereby driving consumers’ ex-ante preferences among the choice sets themselves.

**STUDY 1: SELF-SIGNALING AND UTILITY FROM CHOICE**

Study 1 uses hypothetical scenarios describing consumer choice problems to test H1 and H2. Specifically, participants are asked to assess in which context the choice of an item would provide more utility.

*Method*
Participants were 90 undergraduate students in a public northeastern university who received course credit for their participation. There were two between-subjects conditions, each featuring a consumer choice scenario. Respondents in the vice selection condition were asked to imagine choosing a vice (chocolate chip cookies) on two snacking occasions, once from a mixed and once from a homogeneous choice set. Respondents in the virtue selection condition were asked to imagine choosing a virtue (prunes), also once from a mixed and once from a homogeneous choice set. The dependent variable was a measure of their satisfaction with the chosen option. The scenario in the vice selection condition read as follows, with the manipulation in italics:

Imagine you often have an afternoon snack from a snack machine. On some occasions, you choose tasty, fatty snacks, and on other occasions you choose less tasty but low-fat snacks. Now consider the following two scenarios.

• One afternoon, the machine has both healthy, less tasty snacks such as prunes and dried raisins and great tasting but less healthy snacks such as chocolate chip cookies and salted peanuts. You have some chocolate chip cookies.
• Another afternoon, the machine has only tasty, less healthy snacks such as chocolate chip cookies and salted peanuts. You have some chocolate chip cookies.

On which occasion are you more satisfied with choosing the chocolate chip cookies?

[___] When the snack machine offers both great tasting but less healthy snacks such as chocolate chip cookies and salted peanuts and healthy, less tasty snacks such as prunes and dried raisins.
[___] When the snack machine offers only great tasting but less healthy snacks such as chocolate chip cookies and salted peanuts.
[___] It makes no difference.

The scenario in the virtue selection condition read as follows:

Imagine you often have an afternoon snack from a snack machine. On some occasions, you choose tasty, fatty snacks, and on other occasions you choose less tasty but low-fat snacks. Now consider the following two scenarios.

• One afternoon, the machine has both healthy, less tasty snacks such as prunes and dried raisins and great tasting but less healthy snacks such as chocolate chip cookies and salted peanuts. You have some prunes.
• Another afternoon, the machine has only less tasty, healthy snacks such as prunes and dried raisins. You have some prunes.

On which occasion are you more satisfied choosing the prunes?

As a robustness check, we included a second scenario in each of the scenario-based studies reported here (i.e., studies 1, 3, 4, and 5); we summarize the results of each of these below.
When the snack machine offers both great tasting but less healthy snacks such as chocolate chip cookies and salted peanuts and healthy, less tasty snacks such as prunes and dried raisins.

When the snack machine offers only healthy, less tasty snacks such as prunes and dried raisins.

It makes no difference.

Results and Discussion

The results were as predicted. The utilities of both the vice and the virtue options depended on which type of choice set the item was chosen from ($\chi^2 (1) = 13.2, p<.001$). Specifically, participants had a relative preference for choosing the vice in the absence of a virtue. As shown in Figure 1, 54% percent of the respondents in the vice-selection condition said they would be more satisfied with the vice from the homogeneous set (where only the cookies were available) than from the mixed set (where both the cookies and the prunes were available), whereas only 22% of the respondents indicated greater utility of the vice when it came from the mixed set ($\chi^2 (1) = 5.8, p<.02$; 24% said the choice set would not affect their utility, $n = 45$). Also as predicted, participants had a relative preference for choosing the virtue in the presence of a vice. Only 20% of the respondents said they would be more satisfied with the virtue from the homogeneous set (where only the cookies were available) than from the mixed set (where both the cookies and the prunes were available), whereas 56% of the respondents indicated greater utility of the virtue when it came from the mixed set ($\chi^2 (1) = 7.5, p<.01$; 24% said the choice set would not affect their utility, $n = 45$). We replicated these effects in a second scenario involving a dinner choice, in which the utility of steak as a vice and organic pasta as a virtue similarly depended on whether they where chosen from homogeneous or mixed
choice sets ($\chi^2 (1) = 5.7, p<.05$).

[Insert Figure 1 about here]

While these results support our hypotheses, there are three possible limitations, which the next study addresses. First, study 1 involved respondents’ predictions that may not reflect utility from consequential choices. So we next seek to replicate the observed pattern of utility in a situation where participants make real choices. Second, we want to test our hypotheses in a situation where each participant is exposed only to a single choice context, not to both. This is important because the design of study 1 encouraged participants to explicitly compare and contrast the mixed and homogeneous choice sets, thus highlighting the difference between the two.

**STUDY 2: SELF-SIGNALING UTILITY WITH REAL CHOICE SETS**

Study 2 tests H1 and H2 by comparing utility from real choices of items from heterogeneous, mixed choice sets comprised of both virtues (apples) and vices (candy bars) with the utility of either virtues or of vices chosen in the absence of the other.

*Method*

Participants were 156 undergraduate students at a private northeastern university. The choice options were a candy bar (the vice option) and two fresh green apples (the virtue option). We manipulated whether participants were assigned to a mixed set with both vice and virtue items or a homogeneous set with only the vice option or only the
virtue option. In the homogeneous condition, the experimenter simply offered them either a candy bar or two apples.

In study 1, participants had been told to rank the relative utility of an item they imagined they had already chosen. This allowed us to compare the utility for the vice or a virtue depending on whether it came from a mixed or a homogeneous set. To maximize the likelihood that participants’ choices from the mixed set matched the corresponding items from the homogeneous set (i.e., either the apple or the candy bar, depending on the condition), participants were approached where they would be likely to select that specific item. To induce selection of the virtue option, we approached students who were exiting the university gym. To induce selection of the vice option, we approached them as they were exiting a fast food restaurant. Pre-testing had revealed that students who exited the gym would prefer the apples to the candy bar whereas students who exited the fast food restaurant would prefer the candy bar to the apples.

Participants were asked to fill out an unrelated survey and then offered either the apples or the candy bar (in the homogeneous set condition) or a choice between the apples and the candy bar (in the mixed set condition) as compensation. In addition, participants were allowed to decline this compensation (i.e., just like in study 1, a no-choice option was provided to avoid response distortions from forced choice; Dhar and Simonson 2003). Finally, participants were asked to rate on a 7-point scale how satisfied they were with the items (1= “not satisfied at all,” 7= “very satisfied”).

Results and Discussion
We had predicted that participants would be more satisfied with the apples when they came from a mixed choice set. In the mixed set-condition that primed participants to choose the apples, seven of the 38 participants did not choose them. Therefore, we did not have a rating of their (apparently low) satisfaction with the apples. Excluding these respondents from the analysis therefore creates an upward bias in the mean rating in this group in comparison to those in the homogeneous choice set condition. Accordingly, we also excluded the seven participants with the lowest evaluations of the apples in the homogeneous virtue selection condition. For the same reason, eight participants were excluded in the homogeneous vice selection condition to control for the eight who did not choose the candy bar from the mixed set. This correction did not affect the results, but it eliminates any possible concerns about a selection bias from including participants in the homogeneous set condition who may have valued the option they received less than the one they were not offered.

The results were as predicted. Figure 2 shows participants’ mean ratings of satisfaction with their chosen options. Participants were more satisfied with the vice (i.e., the candy bar) when it came from a homogeneous set that contained only candy bars ($M = 5.56$) than when it came from a mixed set that contained both apples and candy bars ($M = 4.68$; $t = 2.60$, $p < .05$). The reverse was true for participants in the virtue condition. They were more satisfied with their selection when it came from a mixed set that contained both apples and candy bars ($M = 5.23$) than when it came from a homogeneous set that contained only apples ($M = 4.47$; $t = 2.23$, $p < .05$).

[Insert Figure 2 about here]

Studies 1 and 2 rule out two rival accounts, according to which the presence of
attractive but forgone choice options generally reduces the utility of the chosen item, either because of regret (Carmon, Wertenbroch, and Zeelenberg 2003) or because of attempts to reduce cognitive dissonance from having forgone these attractive options (Festinger 1957). Both accounts would have predicted a symmetric effect of greater satisfaction with either item when it is chosen from a homogeneous set because that minimizes potential regret and dissonance, contrary to what we found.

Our results in study 2 replicate the pattern of findings from study 1, which employed within-subject comparisons of hypothetical choice sets. Participants’ responses seem no different when faced with real choice sets than when faced with hypothetical choice sets. Because of the equivalence of the results in studies 1 and 2, we model our subsequent studies on the simpler design of study 1.

**STUDY 3: THE SIGNAL VALUE OF TEMPTATION**

Studies 1 and 2 have shown the effect of choice set composition on option utility that we hypothesized. The set, from which vices and virtue options are chosen, affects the utility that consumers derive from these vices and virtues. We have proposed that this effect derives from the context-dependent self-signaling of consumers’ licentiousness or willpower that arises from their choices. To test this self-signaling explanation and provide a boundary condition, study 3 manipulates the information, or signal, value inherent in the choice set by varying the viability of the choices participants can make and by allowing them to attribute their choices to themselves or to situational constraints.

Consider again our earlier proposition that a negative, context-induced self-
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attribution increases the cost of temptation. However, the negative self-attribution weakens when the feasibility of virtues as choice options is limited. For example, consider the following choice sets, A: \{organic pasta, steak\} and B: \{organic pasta with garlic sauce to which you are allergic, steak\}, where choosing the pasta dish from B is no longer feasible. Thus, a person who chooses a steak from B will be less likely to attribute her choice to the weakness of her will than a person who chooses a steak from A. As a result, we predict a preference for choosing a vice from a mixed set that limits the feasibility of the virtue options rather than from an unconstrained mixed set.

Similarly, consider our proposition that a positive, context-induced self-attribution provides a benefit of temptation when choosing a virtue. However, the positive self-attribution weakens when the feasibility of vices as choice options is limited. For example, consider the following choice sets, A: \{organic pasta, steak\} and B: \{organic pasta, steak with cream sauce to which you are allergic\}, where choosing the steak dish from B is not feasible. Thus, a person who chooses the pasta from B will be less likely to attribute her choice to the strength of her willpower than a person who chooses the pasta from A. As a result, we predict a preference for choosing a virtue from a mixed set that does not limit the feasibility of the vice options rather than from a constrained mixed set.

Method

Sixty-four individuals in New York City were recruited as participants in this experiment. They each received $1 for their participation. They read a scenario, given in appendix 1, in which they were asked to imagine having made the same choice between a
vice and a virtue on two separate occasions. To manipulate the viability of the non-chosen option, respondents were told to assume that they were allergic to an ingredient in that option on one occasion but not on the other. We manipulated between subjects whether the virtue or the vice was chosen. We asked participants to select the situation, in which they would be more satisfied with the chosen item.

Results and Discussion

Our analysis confirmed the predicted asymmetric effects of the self-signaling value of the choice set on the utility of the chosen options ($\chi^2 (1) = 14.1, p<.001$). Our participants found the vice more satisfying when it came from a set with a low signal value, allowing them to attribute their choice externally. In contrast, they found the virtue more satisfying when it came from a set with high signal value, allowing them to attribute their choice internally.

As shown in Figure 3, 48% of the participants in the vice selection condition said that they would be more satisfied with the vice (the steak) when the feasibility of the available virtue was limited because of their allergy (to the garlic in the organic pasta sauce) than when the feasibility of the virtue was not restricted (organic pasta without garlic sauce). Only 16% indicated the reverse preference ($\chi^2 (1) = 7.0, p<.01$; 36% said the choice set would not affect their utility, $n = 44$). In contrast, a majority of 58% of the participants in the virtue selection condition said that they would be more satisfied with the virtue (the organic pasta) when the vice was a feasible choice option (the steak without cream sauce) than when the feasibility of the vice was restricted because of their
allergy (to the cream in the steak sauce). Only 22% indicated the reverse preference ($\chi^2(1) = 7.1, p<.01$; 20% said the choice set would not affect their utility, $n = 45$).

We replicated these effects in a second scenario involving a snack choice similar to the one described in study 1, in which the utility of chocolate chip cookies as a vice (or prunes as a virtue) similarly depended on whether prunes (chocolate chip cookies) that were also part of the choice set were feasible options ($\chi^2(1) = 12.3, p<.001$).

Our participants felt that vices are more satisfying when virtues that are also available in the choice set do not, rather than do, present feasible consumption alternatives (e.g., due to an allergy). That is because rejecting virtues that would have been feasible alternatives to a chosen vice reminds consumers of their licentiousness. If the virtues had been feasible, then choosing the vice would signal much more clearly that they have given in to temptation. In contrast, participants felt that virtues are more satisfying when vices that are also available in the choice set do, rather than do not, present feasible alternatives. That is because rejecting vices that would have been feasible alternatives to a chosen virtue conveys a sense of willpower and control to consumers. If the vices had not been feasible, then choosing the virtue would not signal as clearly that they have successfully resisted temptation. So the self-signaling value that is implied by the composition of the choice set affects how much utility consumers derive from an item they have chosen from that set.

The design and the findings of study 3 rule out the following possible alternative explanation for our first two studies. Instead of sending a signal about the strength or weakness of one’s willpower, choosing a virtue in the presence of an unhealthy vice may
simply make the positive health effects of the virtue more salient, enhancing its 
attractiveness in the mixed compared to the homogenous set. Conversely, choosing a 
vice in the presence of a healthy virtue may make the negative health effects of the vice 
more salient, reducing its attractiveness in the mixed compared to the homogenous set. 
This account cannot explain our findings in study 3 for two reasons. First, the two choice 
situations that participants compared both involved mixed choice sets, keeping the 
salience of health effects fixed. Second, this alternative account would imply that 
choosing a virtue from a mixed set is even more satisfying in the presence of a vice to 
which one is allergic (i.e., a vice with even more adverse health effects, enhancing the 
attractiveness of the chosen virtue even more) than in the presence of a vice to which one 
is not allergic, contrary to what we find.

**STUDY 4: SELF-SIGNALING EFFECTS ON WILLINGNESS TO PAY**

Studies 1 and 2 demonstrated the hypothesized effects of choice set composition 
on consumption utility and study 3 showed that these effects derive from the self-
signaling value implied by the set. Our self-signaling account suggests why a consumer 
who chooses a vice or a virtue might associate different degrees of utility with his choice 
depending upon the composition of the choice set. As noted earlier, this self-signaling 
utility should be incorporated into the utility of the chosen item (Prelec and Bodner 2003; 
Thaler 1985). In study 4, we explore behavioral implications of these self-signaling 
effects on utility. Specifically, we examine whether consumer willingness to pay (WTP) 
for a vice or a virtue directly reflects the self-signaling utility derived from the choice set,
from which it is chosen.

We predict the following. As proposed, selecting a vice in the presence of a virtue induces temptation costs and a negative self-attribution that diminish the utility of consuming the vice. Hence, consumer WTP for a vice should be higher when it comes from a homogeneous set than when it comes from a mixed choice set. On the other hand, selecting a virtue in the presence of a vice induces temptation benefits and a positive self-attribution that enhance the utility of consuming the virtue. Hence, consumer WTP for a virtue should be higher when it comes from a mixed choice set than when it comes from a homogeneous set.

Method

Participants were 178 undergraduate students at a public northeastern university who received course credit for their participation. They responded to a scenario involving dinner choices, which is illustrated in appendix 2. The experiment used a $2 \times 2$ between-subjects design. First, we varied whether participants were asked to imagine that they wanted to consume a vice (steak) or a virtue (organic pasta). Second, we manipulated whether they were presented with a mixed (vice and virtue) or a homogeneous choice set (vice or virtue). We asked participants to state their WTP for the chosen item.

Results and Discussion

The results are shown in Figure 4, revealing the predicted interaction effect of
item type (vice versus virtue) and set (mixed versus homogeneous) on WTP \[F(1, 176) = 11.25, p<.001, \text{based on logged WTP}\]. Participants’ stated WTP for a virtue was higher when it was chosen from a mixed set (\(M=13.26\)) than when it was chosen from a homogeneous set (\(M=11.08, t=3.01, p<.01\)). In contrast, WTP for a vice was higher when it was chosen from a homogeneous set (\(M=17.11\)) than when it was chosen from a mixed set (\(M=15.00, t=1.72, p<.09\)). A second scenario involving snacks (chocolate chip cookies and prunes) yielded a similar interaction effect \[F(1, 177) = 4.85, p<.03\].

Neither scenario revealed a main effect of greater willingness to pay for the virtue than for the vice. This rules out a contrast effect as another possible alternative explanation for why virtues provide greater utility when they are chosen in the presence of vices and why vices provide greater utility when they are chosen in the absence of virtues. Suppose consumers preferred virtues over vices. Then the presence of a vice might create a contrast that would enhance the utility of a virtue in the mixed set compared to its utility in the homogeneous set. Similarly, the presence of a virtue might create a contrast that would reduce the utility of a vice in the mixed set compared to its utility in the homogeneous set. Contrary to this account, our WTP results show that our participants did not prefer the virtue over the vice, ruling out such a contrast effect.

These results demonstrate another important implication of the choice set effects we have identified. Consumers directly incorporate the value of the self-signal ensuing from the choice set composition into the utility they derive from the chosen option. They are willing to pay more for virtues that are offered in mixed sets together with vices and more for vices that are sold from sets that do not contain virtues. For example, all else
equal, consumers might pay more for salad when they buy it in fast food outlets than when they buy it in health food restaurants, while the presence of a salad in fast food outlets bar might lower consumers’ WTP for hamburgers.

**STUDY 5: SELF-SIGNALING PREFERENCES AMONG CHOICE SETS**

So far, the participants in our studies reported on the utility (i.e., satisfaction, WTP) of an item conditional on having chosen the item in the presence or absence of other items in the choice set. But does this dependence of utility on the choice context affect consumer choices themselves? We propose that consumer choice may be motivated by the ex-ante desire to obtain a positive self-signal so that consumers actively seek out choice situations that can provide for a positive signal value.

Specifically, study 5 examines whether consumer preferences for choice sets such as preferences among restaurant menus or retailer assortments depend on the strength of the temptation induced by these sets. An offshoot of our basic hypotheses about context effects on utility is that preferences among choice sets themselves should depend on the sets’ capacity for self-signaling. Consider consumers who sometimes choose vices (instead of virtues) on impulse but who would generally prefer to choose virtues, that is, consumers with a meta-preference for virtues (Elster 1984; Jeffrey 1974). We propose the following. When the temptation to consume a vice is weak and these consumers therefore anticipate consuming a virtue, they prefer mixed choice sets over homogeneous sets that contain only virtues, because they enjoy consuming virtues more when they come from mixed sets. So the signaling benefits outweigh the temptation costs. However, when these
consumers anticipate the unwanted temptation to consume a vice from the mixed set and think they will succumb to it, they will select a constrained, homogeneous set including only virtues as a means of self-control by precommitment. In this situation, the temptation costs outweigh the signaling benefits. Accordingly, we predict that virtue consumers’ relative preferences for choosing from mixed (both virtues and vices) rather than homogeneous (virtues only) sets weaken as the intensity of the temptation (and with it the salience of the temptation costs) to choose a vice from the mixed set increases.

To test this prediction, we manipulate the strength of temptation by varying the timing of choice. Research on hyperbolic discounting suggests that immediate choices induce stronger temptation than delayed choices (e.g., Frederick, Loewenstein, and O’Donoghue 2003), and immediate choices are construed in more concrete terms, highlighting situational aspects such as the temptation inherent in the choice situation (Trope and Liberman 2003). So the sooner a consumer with a meta-preference for virtues gets to choose from a mixed set, the more salient the temptation induced by vices in the set will be along with the potential cost of giving in to the temptation. Hence, her preference for facing a mixed choice set rather than a homogeneous virtue-only set, \{h,u\} > \{u\}, weakens with the temporal proximity to her choice from the set.

Method

We recruited 110 pedestrians in New York City as participants in this experiment. As in study 3, each received $1 for their participation. They read a scenario, in which they were asked to imagine themselves facing a choice between two menus. We
manipulated between subjects when items had to be chosen for consumption from each of these menus, later the same day (immediate choice condition) or a month later (delayed choice condition). The dependent variable was the participants’ choice between a (larger) mixed menu and a (smaller) virtue-only menu. Because we were interested in how temptation benefits affect the utility of virtue consumption, we asked participants to imagine that they felt that they should consume virtues (i.e., to induce a meta-preference for virtues). The scenario including the choice delay manipulation is given in appendix 3. We counterbalanced which pair of virtue items was offered in the mixed menu (Hotel A).

Results and Discussion

The results were as predicted; the proportions of participants preferring the mixed or the virtue-only menus depended on the strength of temptation as shown in Figure 5 ($\chi^2 (1) = 19.1, p<.0001$). An overwhelming majority of 82% of the participants preferred the mixed menu when the consumption choice was delayed and temptation was weak, whereas only 7% preferred the virtue-only menu ($\chi^2 (1) = 34.3, p<.0001$; 11% said they would be indifferent between the menus, $n = 55$). In contrast, that preference for the mixed menu disappeared when the consumption choice was immediate and temptation was strong ($\chi^2 (1) = .08, p<1$; 45% preferred the mixed menu, 42% preferred the virtue-only menu, and 13% said they would be indifferent between the menus, $n = 55$). A second scenario involving choices among dinner menus yielded similar results ($\chi^2 (1) = 5.8, p<.05$).

[Insert Figure 5 about here]
These findings illustrate an important behavioral implication of the context-dependent self-signaling effects we have shown. When faced with a choice between choice sets, or menus, consumers prefer to consume virtues from mixed menus that contain both virtues and vices, but only when the temptation by the vice is not overwhelming. That is because choosing a virtue in the presence of weakly tempting vices makes one’s ability to resist temptation more salient, which provides a signal of one’s temperance and thus enhances the otherwise less appealing experience of consuming a virtue.

Two comments are in order. First, our results are driven by the overwhelming preference for the mixed menu in the (weakly tempting) delayed choice-condition, as implied by the signaling account. This refutes an alternative account of the predicted interaction, according to which consumers may have a preference for self-control by precommitting to the virtue-only menu in the (strongly tempting) immediate choice-condition (Gul and Pesendorfer 2001). Our data show that the effect of the signaling benefits on menu preferences in the delayed choice-condition is bigger than any possible effect of a preference for precommitment on menu preferences in the immediate-choice condition.

Second, an alternative explanation for our findings could be that consumers who face a delayed consumption choice are uncertain of what their preferences will be at the time of choice. A stronger preference in this study for the mixed menu (which contained more alternatives than the virtues-only menu) under delayed than under immediate choice may then have resulted from a strategy of keeping one’s options open until the last possible moment, till the choice has to be made, a preference for flexibility (Kreps 1979;
To test this explanation, we replicated the experiment with a second sample of 110 New York City pedestrians, this time presenting them with a choice between two virtue-only menus consisting of the virtues in the initial experiment, one larger and the other smaller. However, we found no difference in the preference for the larger menu between the immediate and delayed choice conditions, ruling out the preference uncertainty explanation.

**DISCUSSION**

Consumers often infer from their choices what kind of person they are. The utility of such self-signaling depends not only on what a person has chosen but also what else they could have chosen. Thus, the signal value of choosing a vice or a virtue depends on the choice set. In studies 1 and 2, we showed that a vice provides more utility when it is chosen from a homogeneous rather than from a mixed choice set, whereas a virtue provides more utility when it is chosen from a mixed rather than from a homogeneous choice set. Study 3 provided a test of the signaling mechanism by manipulating the signal value of a given choice via the feasibility of other options in the choice set. Study 4 showed that the utility derived from the choice context affects consumers’ willingness to pay for selected vice and virtue items. Study 5 showed that consumers’ ex-ante preferences among the choice sets themselves depend on whether they anticipate being able to resist temptation and thus derive positive signaling value from the choice set.

*Theoretical Implications.* Our findings make the following theoretical contributions. First, we add to the literature on consumer impulsiveness and self-control
The Costs and Benefits of Temptation in Consumer Choice

by showing that temptation has ex-post costs and benefits independently of consumption and impulse control. Prior research on self-control has focused on the ex-ante costs of resisting temptation through expending willpower (e.g., Baumeister 2002; Bénabou and Tirole 2004; Hoch and Loewenstein 1991). In addition to these psychic costs, the costs could be monetary and other economics costs such as paying a precommitment premium or penalty to limit access to tempting vices (e.g., Ariely and Wertenbroch 2002; Gul and Pesendorfer 2001; Trope and Fishbach 2000; Wertenbroch 1998). Finally, research has shown that consumers are willing to expend costly effort to earn the right to indulge in vice consumption (Kivetz and Zheng 2006). In contrast, we examine the psychological costs of yielding to temptation and the benefits of resisting it, which both accrue ex-post.

Second, we show empirically that the valuation of a chosen option depends on the self-signal, which the choice implies. That is, the ex-post self-signaling benefits of temptations can enhance utility from choice if consumers successfully resist the tempting options. Conversely, the cost of temptation will detract from the utility if consumers have succumbed to the temptation. This is in line with Prelec and Bodner’s (2003) proposition that the total utility from choice is derived from the outcome itself as well from its diagnosticity as a signal. To the best of our knowledge, our paper is the first empirical demonstration that self-signaling contributes to the total utility of the chosen item.

Third, we add to the emerging theoretical literature on self-signaling (e.g., Bénabou and Tirole 2004; Prelec and Bodner 2003) by showing that the self-signaling utility depends not only on what a person has chosen but also on what else they could have chosen. Such counterfactual thinking is influenced by the presence or absence of other choice options and by the feasibility of choosing these other options. For example, a
smoker will derive more self-signaling benefits from choosing not to smoke in a bar in Paris, where smoking is (still) allowed and, better yet, many other patrons are smoking, than in a bar in New York City, where smoking is prohibited.

Fourth, while the self-signaling costs and benefits of temptation arise ex-post, a consumer who anticipates this (dis)utility from signaling is likely to take it into account in her choices. Thus, in contrast to prior research on self-control by precommitment that suggests that people limit their own access to vices or avoid choice sets that include vices altogether (e.g., Gul and Pesendorfer 2001; Wertenbroch 1998), a strategic consumer who believes in her ability to resist temptation would prefer a choice set that includes tempting options. Thus, paradoxically, having vices in your choice set enhances the utility of choosing a virtue.

**Future Research.** Our findings suggest opportunities for future research into the following issues. First, we investigated self-signaling effects by examining choices and satisfaction with the chosen items. Future research should examine changes in participants’ self-perceptions as a function of choosing from homogeneous or mixed sets and test if these perceptions mediate effects on the utility of chosen vice and virtue items.

Second, an interesting question is whether repeated self-signaling over time may transfer the utility from signaling to the outcome itself more permanently (Bénabou and Tirole 2004), in contrast to Prelec and Bodner’s (2003) model that treats outcome and diagnostic utility separately. For example, will a person who repeatedly chooses reduced-fat potato chips over fatty chips learn to like reduced-fat chips more over time than when fatty chips never enter into the choice set? In that case, marketers and consumers themselves could strategically shape the latter’s preferences for less appealing
virtues by consistently constructing choice sets with self-signaling benefits.

Another interesting question is whether the signaling effects shown here are of symmetric strength. Motivated reasoning suggests that people might be more likely to naturally generate counterfactual choices when they choose vices (e.g., “I should have exercised instead of overeating for lunch”) than when they choose virtues. Thus, virtues might benefit more from being chosen from mixed sets than vices might benefit from being chosen from homogeneous sets (because consumers might be less likely to naturally generate counterfactuals to choices from homogeneous sets of virtues than of vices). Moreover, the diagnostic disutility of forgoing a virtue when you are consuming a vice may linearly increase with the extremity of the forgone virtue. For example, attending a football game is much worse when you are missing your anniversary dinner with your spouse than when you are missing a normal weekend end dinner with him or her. In contrast, the diagnostic utility of forgoing a vice when you are consuming a virtue may level off eventually even if the forgone vice becomes more extreme.

Fourth, our account of self-signaling effects from the choice context is not limited to consumer choice among products and should thus extend to decisions outside of the typical consumer choice domain we have explored here. For instance, when people make decisions involving moral conflict, charitable giving, and so on they ought to be particularly sensitive to what these decisions reveal about their own character. In line with this conjecture, data by Dhar and Wertenbroch (2006) suggest that self-signaling effects of choice set composition generalize beyond choices of consumer goods to moral choices (e.g., assisting a soup kitchen for the poor versus indulging in a Sunday brunch).

Finally, our findings suggest that self-signaling effects from the presence or
absence of vices or virtues in the choice set may also enhance the extent to which people exercise temperance or indulgence. Vignette-based data by Dhar and Wertenbroch (2006) suggest that consumers are more likely to choose a more indulgent over a less indulgent vice when virtues are absent from the choice set, implying that the presence of virtues induces some temperance in vice consumers.

Managerial Implications. Our research has marketing implications for pricing, assortment policies, and retailer competition. To the extent that value depends on context, pricing of vice of virtue items should take into account the choice context, in which they are offered. Ceteris paribus, marketers ought to be able to charge a premium for virtues (e.g., baked potato crisps), when they are sold in the presence of vices (e.g., regular potato chips). Also, it follows that marketers can design assortments to increase this price premium. For instance, a retailer may benefit by designing a section with virtue items (e.g., a healthy snacks shelf) by introducing a few vice items adjacent to these offerings.

Retailers often compete based on the size and variety of their assortments. In standard economic analysis, the utility of the assortment is the utility of the most preferred item in the assortment. Our findings suggest that, all else equal, retailers who sell virtues such as health food may boost their store or menu attractiveness by including a few vices. This follows directly from showing that items that are not likely to be selected from the menu can still enhance the attractiveness of the menu because of the signaling value of the non-chosen option. Hence, consumer preferences among assortments are also affected by the utility from self-signaling in the purchase context as highlighted by an assortment. If individuals believe they can resist burger temptation, they might prefer choosing a salad at McDonald’s rather than at Subway’s. Of course, if
eaters are wary of succumbing to their temptation, they might prefer to preclude any possibility of ending up choosing a burger and avoid McDonald’s altogether.

Our findings also have implications for how retailers of vices may be able to attract customers who would otherwise not visit their stores. By featuring a few virtue items in their assortments, vice retailers can attract those virtue buyers to their stores as well who think they can resist the vices. For example, the introduction of salad bars may attract new customers to McDonald’s restaurants who are new to the fast food category. That is because McDonald’s provides these unlikely vice consumers with an opportunity to enhance the utility of eating healthy with a (cheap) signal of their own virtuousness—if they can resist the lure of the Big Mac.

In conclusion, we have shown that temptation is not necessarily always costly; it can also be beneficial. The costs and benefits of temptation depend on whether the composition of the choice set creates a positive or a negative self-signal and hence a positive or a negative effect on the utility of the chosen option. We have thus explored at least one sense, in which “it is not good to be without temptations.” There may well be others, but we leave it up to the curious reader to explore those.
APPENDIX 1

This appendix shows the scenario used in study 3. The vice selection condition read:

Imagine you often eat out for dinner. Although you enjoy eating rich, greasy, great-tasting dishes, you feel that you should eat low fat, less tasty, organic dishes. Now consider the following two scenarios.

- One evening, the restaurant you visit offers rich, greasy, great-tasting dishes such as steak and low-fat, less tasty dishes such as organic pasta. You have a steak.
- Another evening, the restaurant you visit also offers rich, greasy, great-tasting dishes such as steak and low-fat, less tasty dishes such as organic pasta. However, the pasta dishes are prepared with garlic sauce, to which you are allergic. You have a steak.

On which occasion are you more satisfied having the steak?

[___] When the restaurant offers great tasting, fatty dishes and low-fat, less tasty dishes.
[___] When the restaurant offers great tasting, fatty dishes and low-fat, less tasty dishes, but you are allergic to the garlic sauce that comes with the pasta.
[___] It makes no difference.

The virtue selection condition read:

Imagine you often eat out for dinner. Although you enjoy eating rich, greasy, great-tasting dishes, you feel that you should eat low fat, less tasty, organic dishes. Now consider the following two scenarios.

- One evening, the restaurant you visit offers rich, greasy, great-tasting dishes such as steak and low-fat, less tasty dishes such as organic pasta. You have organic pasta.
- Another evening, the restaurant you visit also offers rich, greasy, great-tasting dishes such as steak and low-fat, less tasty dishes such as organic pasta. However, the steak is prepared with cream sauce, to which you are allergic. You have organic pasta.

On which occasion are you more satisfied having the organic pasta?

[___] When the restaurant offers great tasting, fatty dishes and low-fat, less tasty dishes.
[___] When the restaurant offers great tasting, fatty dishes and low-fat, less tasty dishes, but you are allergic to the cream sauce that comes with the steak.
[___] It makes no difference.
APPENDIX 2

This appendix shows the scenario used in study 4. The wording in the vice [virtue] selection condition is in italics [brackets]. The homogeneous choice set-condition read:

Imagine that you go out to dinner with friends. The restaurant has *only tasty, less healthy dishes such as delicious steak* [only healthy, less tasty dishes such as organic pasta]. You choose the *steak* [organic pasta].

In this situation, what is the maximum amount you would be willing to pay for this kind of dish? Please fill in a dollar (to the penny if you like) amount here. $ [____.____]

The mixed choice set-condition read:

Imagine that you go out to dinner with friends. The restaurant has both tasty, less healthy dishes such as delicious steak and healthy, less tasty dishes such as organic pasta. You choose the *steak* [organic pasta].

In this situation, what is the maximum amount you would be willing to pay for this kind of dish? Please fill in a dollar (to the penny if you like) amount here. $ [____.____]

APPENDIX 3

This appendix shows the scenario used in study 5. The between-subjects temporal distance manipulation is shown in italics versus brackets.

Imagine that you are leaving for a trip to Los Angeles *later today* [a month from now]. Your travel agent has a special arrangement with the following two otherwise identical hotels.

- Hotel A serves both great-tasting but unhealthy items and less tasty but healthy items for breakfast (see sample menu below).
- Hotel B serves mostly less tasty but healthy breakfast items (see sample menu).

**Breakfast at Hotel A**

Sample healthy breakfast items:
- Whole-wheat bread with low-fat cheese
- Low-fat organic yoghurt

Sample unhealthy breakfast items:
- Eggs Benedict
- Ham and cheese croissant

**Breakfast at Hotel B**

Sample healthy breakfast items:
- Salt-free whole-grain fruit cereal
- Fresh watermelon

You feel that you should eat the less tasty but healthy dishes for breakfast that are served in both hotels. You know that if you stay at Hotel A, you might be tempted to eat the great-tasting but unhealthy dishes. Since both hotels are quite popular, you have to make a reservation now for the trip *later today* [a month from now]. Which hotel do you choose?

[____] Hotel A (where the breakfast menu contains tempting, unhealthy items as well as less tempting, but healthy items).
[____] Hotel B (where the breakfast menu contains only less tempting, but healthy items).
[____] It makes no difference.
REFERENCES


Figure 1
PROPORTIONS OF RESPONDENTS IN STUDY 1 INDICATING GREATER UTILITY FROM CHOOSING FROM MIXED OR HOMOGENEOUS CHOICE SETS

Figure 2
MEAN CHOICE SATISFACTION RATINGS AS A FUNCTION OF HAVING SELECTED A VICE OR A VIRTUE IN STUDY 2
Figure 3
PROPORTIONS OF RESPONDENTS IN STUDY 3 INDICATING GREATER UTILITY FROM CHOICE SETS THAT ALLOW FOR SELF-ATTRIBUTION OR EXTERNAL ATTRIBUTION

Figure 4
MEAN WILLINGNESS TO PAY IN STUDY 4 AS A FUNCTION OF CHOICE SET
Figure 5
PREFERENCE FOR MENUS (MIXED VERSUS VIRTUE-ONLY) IN STUDY 5 AS A FUNCTION OF STRENGTH OF TEMPTATION (CHOICE SHARES IN PERCENT).