Recalling Past Temptations: An Information-Processing Perspective on the Dynamics of Self-Control

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This research investigates how consumers respond to food-related temptations as a function of recalling their own behavior when faced with a similar temptation in the recent past. Bringing together different streams of relevant research, we propose and find that chronically nonimpulsive individuals display behavioral consistency over time—resisting (succumbing) when they recall having resisted (succumbed) earlier. In contrast, impulsive individuals show a switching pattern, resisting current temptations if they recall having succumbed, and vice versa. These propositions are supported by convergent results across four experiments involving real eating behaviors, response latencies, and hypothetical choices. Implications for consumer welfare are discussed and possible interventions are suggested.

Recent statistics suggest that almost a third of the American population 20–74 years of age can be classified as obese (Flegal et al. 2002). These data underscore the need to study the dynamics of indulgent behaviors—what makes people succumb to temptation, time after sinful time? Indeed, while much of consumer research has focused on stand-alone decisions and point-in-time behaviors, consumers go through life being exposed to strings of stimuli and making sequences of decisions, many of which may be interdependent. This research explores how consumers respond to a given temptation, specifically a tasty but unhealthy food item, contingent on their recall of how they had responded in the face of a similar temptation in the recent past.

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Research in the domain of food-related temptations has shown that the relative strength of inhibitory and instigating forces is affected by various contextual factors, such as cognitive load (Ward and Mann 2000), regulatory focus (Sengupta and Zhou 2007), and stress (Tice, Bratslavsky, and Baumeister 2001). Consistent with this perspective, the present research investigates one such situational factor, the salience of recent behavior as induced by its recall, and suggests interventions that increase the press of inhibitory forces among impulsive people who may have succumbed to a temptation in the recent past.

The structure of this article is as follows. First, we present our theoretical framework, bringing together research on self-control, goal structure, and the effects of past behavior to make separate predictions for impulsive and nonimpulsive individuals. Specifically, we predict that nonimpulsives will tend to display consistency over time, doing at time 2 what they recall having done at time 1. In contrast, impulsives will switch behaviors, resisting if they recall having succumbed, and vice versa. We present four experiments that provide support for our hypotheses. Finally, we conclude with a general discussion of limitations, future research, and implications for consumer welfare in the domains of obesity and binge-consumption.

CONCEPTUAL BACKGROUND

Impulsivity and Goal Conflict

Consistent with prior research (Puri 1996; Shiv and Fedorikhin 1999), we define impulsive behavior as "experi-

encing a sudden and unplanned urge to behave in a hedonically pleasing manner that is immediately gratifying and acting on the impulse without careful deliberation regarding possible consequences." Such behavior is typically characterized by a spontaneous urge to engage in an approach action with respect to the tempting object (Rook 1987; Tice et al. 2001). Impulsive behavior is manifested, for instance, when one spontaneously decides to buy an expensive dress that is clearly beyond one's budget. More relevant to our context, choosing a hedonically appealing (but unhealthy) cake over a healthy salad because of a strong instantaneous urge represents another instance of such behavior (Shiv and Fedorikhin 1999). In the current research, we treat impulsive behavior as a personality trait, a perspective that posits that individuals vary in terms of their chronic impulsivity (e.g., Puri 1996; Rook 1987). Viewed as such, an important point of difference between individuals who tend to be impulsive (henceforth, "impulsives") versus those who are usually not ("nonimpulsives") has to do with the extent of conflict experienced in a self-control–related situation (e.g., when exposed to a hedonically tempting but unhealthy food item). In such situations, impulsives are likely to experience substantially greater conflict than nonimpulsives. Support for this premise exists across several related theoretical perspectives, all of which conceptualize impulsive behavior (and therefore loss of self-control) in terms of a battle between two opposing forces such as the hot system versus the cool system (Metcalfe and Mischel 1999), short- versus long-term perspectives (Ainslie 1975), "doing" versus "planning" (Thaler and Shefrin 1981), and desire versus willpower (Hoch and Loewenstein 1991). Inherent in this conceptualization is the recognition that impulsive behavior involves a struggle between two conflicting goals: an instigatory propulsion toward a given behavior, coupled with an inhibitory force. This intrinsic conflict between opposing goals constitutes an essential part of the explanation for impulsivity.

In addition to the theoretical conceptualizations of impulsive behavior as involving a struggle between opposing goals, empirical support has also been obtained for the premise that impulsives are likely to experience a higher degree of conflict. Ramanathan and Menon (2006) demonstrated that, on exposure to temptation, impulsives feel more ambivalence than nonimpulsives and this ambivalence manifests itself as a greater tendency to oscillate between approach and avoidance tendencies toward the temptation. A pilot study conducted for the current research (details available from the authors) provided additional evidence of the positive relationship between impulsivity and felt conflict. In what follows, we draw upon this relationship between impulsivity and goal conflict to theorize about the effects that should obtain for impulsive versus nonimpulsive individuals who are confronted with a temptation (i.e., a hedonically appealing but unhealthy snack) if they recall their past behavior when faced with a similar temptation. Importantly, recalling a past decision at the point of making a current decision serves to bracket the two decisions together (Read, Loewenstein, and Rabin 1999) and hence increases the probability that the prior decision will have an influence on the current decision. This influence could result in *consistency*, such that the same decision is repeated (i.e., the same goal served), or it could result in *switching*, such that the opposite decision is taken (i.e., the conflicting goal is served). We propose that the recall-induced bracketing of the two decisions will have different effects for impulsives and nonimpulsives.

Effects of Recalling Past Behavior for Impulsives. As we have noted earlier, impulsive individuals associate hedonic-healthy situations with two salient, yet conflicting goals: restraint and desire (e.g., Hoch and Loewenstein 1991). Thus, the act of recalling their decision when faced with a prior situation of this nature is likely to bring to mind both of these conflicting goals. Which of these goals is likely to guide current behavior? The literature on goal accessibility provides useful guidelines for answering this question. Research in this area posits that fulfillment of a goal inhibits activation of that goal and constructs related to it, whereas nonfulfillment enhances activation of the goal and related constructs. As several scholars have noted (e.g., Forster, Liberman, and Higgins 2005; Zacks and Hasher 1994), these effects are consistent with a logic based on functionality: it serves a useful purpose if constructs related to a nonfulfilled yet salient goal increase in activation, since such activation is helpful to attain goal fulfillment. Similarly, once a goal has been fulfilled, it becomes relatively less important, and it is therefore functional for related constructs to become less accessible since they may otherwise interfere with behaviors directed to unfulfilled goals (Shah, Kruglanski, and Friedman 2002).

Beginning with Zeigarnik (1927), who demonstrated that interrupted tasks are better remembered than completed ones, various empirical studies have obtained findings supportive of these principles of goal activation and inhibition (Forster et al. 2005; Goschke and Kuhl 1993; Marsh, Hicks, and Bink 1998). For instance, Forster et al. (2005) showed that participants in a lexical decision task were faster to respond to words related to a prior goal before the goal was achieved but slower after the goal was achieved, supporting the premise that fulfillment (nonfulfillment) of a salient goal decreases (increases) the accessibility of goal-related constructs. Similarly, in the context of script learning, it has been found that items associated with an incomplete intention become more accessible than neutral items (i.e., those without an associated intention); however, once the script has actually been completed, items associated with the script reduce in accessibility compared to neutral items (Marsh et al. 1998). Based on these notions of goal conflict and inhibition, we propose that, for impulsives, recalling an action at a prior hedonic-healthy decision situation should inhibit the goal relating to that action while it increases the accessibility of the competing goal. Specifically, if impulsives recall a prior decision of succumbing to (resisting) a temptation, the competing goal of resisting (succumbing) should increase in activation at the current instance. Accordingly,

based on the established premise that accessible goals guide behavior (Bargh and Barndollar 1996; Shah 2003), we predict that impulsives should display a switching effect such that they are more likely to resist a current temptation if they recall having recently succumbed to (rather than resisted) a similar temptation.

It is important to clarify that the current conceptualization of inhibition (for fulfilled goals) and activation (of nonfulfilled goals) represents an extension of prior work. Earlier research has examined these effects in the context of actually requiring participants to perform a behavior—which involves fulfilling or interrupting a goal at a current moment in time—and then examining subsequent effects on goal accessibility. For instance, the original work by Zeigarnik (1927) examined later recall after the interruption or completion of an actual task that participants were engaged in. Similarly, Forster et al. (2005) measured the accessibility of goal-related constructs in the context of an actual task participants were engaged in at the time, either before task completion (resulting in increased activation) or after task completion (resulting in inhibition). In these and other studies, therefore, increased and decreased goal accessibility have referred to the effects of actually performing a behavior that involves accomplishing (or not accomplishing) a currently activated goal. In extension, we propose that similar effects should obtain even when impulsives recall prior behaviors involving goal fulfillment. Such recall in itself should also lead respondents to draw inferences regarding the fulfillment of one goal and the nonfulfillment of the competing goal. Therefore, subsequently, a switching effect should obtain for the same functional reasons that operate in the context of actually having performed a behavior, namely, increased activation of the competing goal at the expense of the fulfilled goal.

Effects of Recalling Past Behavior for Nonimpulsives. While the underlying goal conflict for impulsives should produce a switching effect because of the inhibition/activation processes described above, the picture may be very different for nonimpulsives. In this case, as discussed, the situation is likely to be associated with substantially less goal conflict. In the relative absence of goal conflict, it is not functional for goal-related constructs to become inhibited once a behavior related to that goal has been performed. Instead, recalling a past behavior should make the concomitant goal and related cognitions salient, rather than a conflicting goal. This should reinforce the likelihood of the past behavior being repeated, leading to a consistency effect.

There is much evidence to support this consistency hypothesis. For instance, research on self-perception posits that individuals infer their attitudes from their recollections of past behavior, increasing the likelihood of the same behavior being repeated (Bem 1972). Similarly, research on autobiographical recall has shown that asking individuals to recall past behaviors increases the accessibility of the underlying attitude consistent with those behaviors (Fazio, Herr, and Olney 1984). More recently, Albarracin and Wyer (2000) provided a detailed examination of how a salient recent behavior can influence future intentions and behavior. In a series of studies, they showed that being simply made aware of past behavior led to a subsequent repetition of that behavior. The increased accessibility of cognitions and attitudes consistent with the past behavior contributed to this effect. Thus, in the absence of goal conflict, being made aware of a past behavior makes salient the attitude and cognitions supportive of the behavior and concomitant goal, leading to a repetition of the original behavior. Therefore we predict that nonimpulsive individuals should display consistency in their behaviors, being more likely to resist a current temptation when they recall resisting (vs. succumbing to) a similar recent temptation.

Moderating Influence on the Switching Effect. Our conceptualization thus far suggests that recalling a past behavior induces a switching effect for impulsives because of the reduced salience of the focal goal and the increased salience of the competing goal. However, consistency is obtained for nonimpulsives because recall of a past behavior increases the accessibility of supportive cognitions. This implies that consistency may be obtained for impulsives as well if cognitions supportive of the original behavior are made salient at the time of the current decision. This argument is supported by the view of goals as cognitive structures in long-term memory (Bargh 1990; Kruglanski et al. 2002). The association of goals with other constructs through semantic as well as functional relationships implies that one way of increasing the accessibility of a goal is to make salient the constructs that are related to it. For instance, Shah and Kruglanski (2003) found that priming participants with the means to a goal (e.g., "run") increased its accessibility, as shown by decreased latency of goal-words (e.g., "fit") in a subsequent lexical decision task. Applying this logic to our context, the accessibility of the focal goal should be enhanced at the point of recall if impulsives are asked to recall the reasons for their decision. Bringing these cognitions to mind should remind the individual why that goal was important in the first place while it simultaneously increases accessibility. Further, the more the focal goal is bolstered, the more competing goals will be inhibited (Shah et al. 2002). Thus, even though the act of recalling the prior decision may activate both the focal and the competing goal, the additional bolstering of the focal goal produced by recalling the underlying reasons should inhibit the competing goal. Behavior should then be guided by the focal goal rather than the competing goal, and hence thinking of associated reasons should lead to consistency even for impulsives.

Summary

In sum, we hypothesize that impulsive individuals who simply recall their behavior in a prior hedonic-healthy decision situation are likely to display a switching effect, because merely recalling such behavior serves to inhibit the associated, fulfilled, focal goal while it increases the activation of the nonfulfilled, competing goal. For nonimpulsives, in contrast, recall of the prior behavior should spon-

taneously bring to mind cognitions supportive of the focal goal, thereby increasing its salience and producing a consistency effect. These ideas are tested in a series of experiments. Experiment 1 demonstrates the crucial role of goal accessibility, showing that recalling an earlier behavior increases the accessibility of the behavior-consistent goal for nonimpulsives but the competing goal for impulsives. Experiment 2 then establishes the key finding that recalling a prior behavior produces consistency for nonimpulsives but switching for impulsives. Subsequently, experiment 3 provides support for the mediating influence of goal accessibility on these different behavioral patterns. Finally, experiment 4 documents a boundary condition for the switching effect for impulsives, whereby asking respondents to recall the reasons for their earlier behavior leads to consistency for both impulsives and nonimpulsives.

EXPERIMENT 1: EFFECTS ON GOAL ACCESSIBILITY

The aim of experiment 1 was to provide initial evidence for our hypothesized mechanism. We predicted that recall of a past behavior (in the context of hedonic-healthy decision situations) subsequently leads to different patterns of goal accessibility for impulsives and nonimpulsives. According to our theory, a switching pattern should be obtained for impulsive individuals, such that recalling a prior instance of resisting (succumbing) should increase the accessibility of cognitions and goals related to desire (restraint). In contrast, a pattern of consistency should be obtained for nonimpulsives, such that recalling a prior instance of resisting (succumbing) should increase the accessibility of cognitions and goals related to restraint (desire).

Method

The study crossed recall of prior behavior (resist vs. succumb) with impulsivity, which was measured. Seventy-two undergraduate students at the University of Chicago participated in this study in return for compensation. Participants were asked to recall a recent situation in which they had been exposed to a tempting food item and had either succumbed to the temptation or actively resisted it. They were given 5 minutes to describe this experience. After completing this task, they worked on a brief 5-minute filler task, consisting of a series of moderately easy math puzzles, designed to clear working memory. Subsequently, all respondents participated in a lexical decision task in which they had to judge as fast as possible whether or not a presented string of letters was a meaningful word. Included in this task were words pertaining to pleasure or temptation, those pertaining to restraint, and some that were neutral in content. The lexical decision task commenced with a fixation cross that appeared in the center of the screen for 250 milliseconds and was then replaced by a blank screen for 150 milliseconds. Thus the stimulus onset asynchrony (SOA) was 400 milliseconds. A stimulus string then appeared on the screen and remained until the respondent pressed one of two keys to indicate whether the presented stimulus was a word or a nonword. Respondents were asked to press the key as quickly and accurately as possible. Response times (in milliseconds) and accuracy were recorded by the computer. Participants began the task with a set of 15 trials (seven neutral and eight nonwords) that were meant to familiarize them with the task. Sixty-four experimental trials then followed, with eight words related to temptation, eight words related to restraint, 16 neutral words, and 32 nonwords that were created from other neutral words by changing one letter in the spelling. Each response was followed by a blank screen that remained for an intertrial time of 700 milliseconds.

Participants then filled out a battery of personality items in which was embedded the key measure of trait impulsivity, assessed via a standard 10-item scale wherein they indicated the degree to which phrases such as "easily tempted" or "self-controlled" described them (Puri 1996; the two context-specific items "extravagant" and "enjoy spending" were dropped). We created an index of impulsivity by averaging responses to all items ($\alpha = .84$) after reverse-scoring the items on restraint (see Rook and Fisher [1995] and Sengupta and Zhou [2007] for similar measures of impulsivity based on reverse-scoring restraint items). For the purpose of analysis, we used both the continuous measure and a dichotomous measure (based on a median split; median = 4.9) to classify participants as impulsive or nonimpulsive. Finally, a hypothesis-guessing check showed that none of the participants made any connection between the lexical decision task and the recall task or the personality task.

Results and Discussion

Data from the lexical decision task were prepared for analysis by removing all trials that contained errors (6.2%) and those that had response latencies greater than 2,000 milliseconds (.4%) or lower than 300 milliseconds (.4%). In addition, data from six participants were excluded due to a very high proportion of errors, indicating a relative lack of familiarity with the English language. Since the recall task required participants to think about food-related situations, each participant's recall essay was probed for food-related words that were part of the lexical task. Trials containing such words were removed from the analysis, since the recall task itself could serve as an independent source of accessibility for the lexical task, confounding the results (as per Cesario et al. 2006). As a result, we examined response latencies for five words related to temptation (pleasure, enjoy, delight, pamper, and desire) and five words related to restraint (restrain, refuse, caution, resolve, and muscle), along with 16 neutral words and 32 nonwords. Facilitation scores for temptation and restraint were computed by subtracting each participant's averaged (log-transformed) response times to temptation- and restraint-related words from those for neutral words. A positive facilitation score would indicate faster response times and thus a higher accessibility for the particular category. We hypothesized that, for impulsives, recall of a prior action should increase the accessibility of the competing goal and associated cog-

nitions; therefore, temptation-related words should receive greater facilitation when recalling a prior act of restraint rather than one of succumbing, whereas restraint-related words should be facilitated more after recalling a prior act of succumbing rather than one of restraining. For nonimpulsives, the consistency effect predicts that recalling a prior act of restraint (succumbing) should increase facilitation for restraint-related (temptation-related) words.

Using the continuous measure of impulsivity (after mean-centering the variable), we ran two separate regressions on facilitation scores for temptation-related and restraint-related words, including impulsivity, recall condition (contrast coded), and their interaction as predictors. The regression for temptation-related words showed no main effects for either recall condition ($t(62) = -1.45$, $p > .15$) or impulsivity ($t(62) = -.75$, $p > .45$). However, there was a marginally significant interaction between recall condition and impulsivity ($b = .13$, $t(62) = 1.72$, $p < .09$). In the case of restraint-related words, there were again no significant main effects of either recall condition ($t(62) = -.16$, $p > .85$) or impulsivity ($t(62) = -1.44$, $p > .15$), but there was a significant interaction between recall condition and impulsivity ($b = -.32$, $t(62) = -3.96$, $p < .001$). In order to explicate the interactions, we ran simple slopes analyses on each of the two regressions after recentering impulsivity at one standard deviation above and below the mean (Aiken and West 1991). For ease of exposition, these regressions analyses are reported here separately for impulsives and nonimpulsives. As hypothesized, impulsives had positive and greater facilitation scores (log-transformed) for temptation-related words after they recalled having resisted a prior temptation as opposed to having succumbed in the past ($M_{\text{resist}} = .02$ vs. $M_{\text{succumb}} = -.02$, $b = -.018$, $t(62) = 2.14$, $p < .05$). For restraint-related words, however, impulsives reported greater facilitation scores after they recalled succumbing to versus resisting a prior temptation ($M_{\text{resist}} = -.03$ vs. $M_{\text{succumb}} = .02$, $b = .025$, $t(62) = 2.78$, $p < .01$). These data are strongly supportive of the posited switching pattern for impulsives.

Unlike impulsives, nonimpulsive individuals showed no differences in facilitation scores for temptation-related words when recalling prior resistance versus succumbing ($p > .77$). However, contrary to expectation, a consistency effect (which would predict facilitation for temptation-related words in the prior succumbing condition) was not manifested either. Nevertheless, analysis of the restraint-related words did support the consistency thesis: facilitation scores for these words were higher when nonimpulsives recalled resisting versus succumbing to a prior temptation ($M_{\text{resist}} = .01$ vs. $M_{\text{succumb}} = -.05$, $b = -.03$, $t(62) = 3.05$, $p < .01$).

Exactly similar results were obtained with standard planned contrasts in the context of a 2 (recall condition) × 2 (impulsivity) MANOVA, with impulsivity being treated as a dichotomous, median-split variable. Consistent with switching, impulsives reported positive and greater facilitation scores for temptation-related words after recalling past resistance versus recalling past succumbing ($M_{\text{resist}} = .029$ vs. $M_{\text{succumb}} = -.026$, $t(62) = 3.23$, $p < .01$), while the reverse was true of restraint-related words ($M_{\text{succumb}} = .033$ vs. $M_{\text{resist}} = -.034$, $t(62) = 3.66$, $p < .001$). Unlike impulsives, nonimpulsives showed no difference in facilitation scores for temptation-related words when recalling prior resistance versus recalling prior succumbing ($p > .5$), indicating neither a switching nor a consistency pattern. However, analysis of the restraint-related words supported the consistency thesis: facilitation scores for these words were higher when nonimpulsives recalled resisting versus succumbing to a prior temptation ($M_{\text{resist}} = .00$ vs. $M_{\text{succumb}} = -.05$, $t(62) = 3.79$, $p < .001$).

Results from experiment 1 thus largely supported our theorizing. For impulsives, recalling a prior act of resistance increased the accessibility of cognitions relating to the opposing goal of pleasure, while recalling a prior act of succumbing to temptation increased accessibility of cognitions relating to the opposing goal of restraint. Further, consistent with predictions, no such switching effect was obtained for nonimpulsives for either prior resistance or prior succumbing. Rather, partial support was obtained for a consistency effect, according to which recalling a prior behavior should increase the accessibility of supportive cognitions. In particular, recall of a prior act of resistance increased the accessibility of cognitions related to the consistent goal of restraint. However, such an effect was not obtained when nonimpulsives recalled an act of succumbing to temptation—doing so did not increase the accessibility of cognitions related to the focal goal of pleasure. It is possible that, since instances of indulgence may be relatively rare among nonimpulsives, the use of a filler task between the recall task and the lexical decision task led to reduced accessibility of temptation-related words. Instances of resisting temptation are more likely to be chronically accessible and hence not subject to decay over time.

EXPERIMENT 2: BEHAVIORAL CONSISTENCY VERSUS SWITCHING

Drawing on the accessibility-based mechanism delineated above, experiment 2 examines how recalling past behavior in the face of prior temptation affects current behavior when one is faced with a similar situation. In line with the premise that currently accessible goals guide behavior (Bargh and Barndollar 1996; Kruglanski 1996), we propose that impulsives display switching, being more likely to resist when they recall a past act of succumbing as compared to recalling a past act of restraint. For nonimpulsives, however, in accordance with the pattern of consistency that has been documented by much earlier research (e.g., Albarracin and Wyer 2000) and also partially supported by our accessibility results in experiment 1, we propose that the response to the current temptation should mirror the past behavior. That is, they should be more likely to resist (succumb) if they recall past restraint from (giving in to) temptation.

Method

This study again crossed recall of prior behavior (resist vs. succumb) with impulsivity measured. Students at the Hong Kong University of Science and Technology ($N = 119$) participated for monetary compensation. The procedure was similar to experiment 1, with the exception of the major dependent variable. Thus, as before, participants recalled a recent instance when they had either resisted or succumbed to a tempting food item, and they were given 5 minutes to describe this experience. Immediately afterward, they were escorted to a different room and assigned to separate workstations, each with a covered box on it. After they had settled, the experimenter lifted the boxes to reveal bowls full of cheeseballs (each bowl containing exactly 50 identical cheeseballs, which pretesting had revealed to be tasty and tempting but unhealthy) and said, "We will take a little while to prepare the next task, so if you'd like, please help yourself to some snacks while you wait." For the next three minutes, the experimenter turned her back and pretended to be busy. The bowls, which had unobtrusive identifying markings, were then taken away. A later count revealed how many cheeseballs had been eaten; this constituted the key dependent variable for the study. After removing the bowls, the experimenter handed out the final questionnaire consisting of personality measures, including the Puri (1996) measure of impulsivity. The items composing the impulsivity scale ($\alpha = .79$) were again averaged to form a single measure after appropriate reverse-scoring, and a median split (median $= 4.60$) was used to identify impulsives versus nonimpulsives. Finally, we collected a measure of mood ("Could you please tell us how you are feeling right now?" 1 = "In a bad mood"/7 = "In a good mood"), following which participants were debriefed and thanked.

Results and Discussion

According to our conceptualization, impulsives should be more prone to resist temptation after recalling an earlier instance of succumbing rather than one of restraint, while nonimpulsives should be more likely to resist if they recall having resisted. A regression using the continuous measure of impulsivity (mean-centered to reduce multicollinearity) yielded a marginally significant main effect of impulsivity ($b = -2.25$, $t(115) = -1.73$, $p < .09$), qualified by a significant interaction between impulsivity and recall condition ($b = 4.06$, $t(115) = 2.29$, $p < .05$). Slopes analysis (Aiken and West 1991) showed that, for impulsive people, the effect of recall condition was marginally significant ($b = -3.64$, $t(115) = -1.91$, $p < .06$), indicating that they ate fewer cheeseballs (i.e., resisted more) when they recalled succumbing compared to resisting a prior temptation ($M_{\text{resist}} = 6.41$, $M_{\text{succumb}} = 2.78$). For nonimpulsive people, the effect of recall condition was directionally consistent with our predictions, but nonsignificant ($b = 2.53$, $t(115) = 1.34$, $p < .20$; $M_{\text{resist}} = 3.00$, $M_{\text{succumb}} = 5.53$). Similar results were obtained using standard planned comparisons in the context of a 2 (impulsivity) × 2 (T1 behavior) ANOVA, with impulsivity being treated as a dichotomous variable based on a median split. As expected, a significant interaction was obtained ($F(1, 115) = 10.01$, $p < .01$). Planned contrasts then showed that impulsives who recalled having succumbed to an earlier temptation ate fewer cheeseballs than those who recalled having resisted earlier ($M = 2.21$ vs. $M = 5.93$; $F(1, 115) = 3.92$, $p < .05$). In contrast, and as predicted, nonimpulsives who recalled having succumbed ate more cheeseballs than those who recalled resisting ($M = 6.93$ vs. $M = 2.36$; $F(1, 115) = 6.26$, $p < .05$). Finally, a 2 (impulsivity) × 2 (T1 behavior) ANOVA revealed no effects on mood (all F's < 1), indicating that these results cannot be explained by differences in participants' mood across conditions.

These results provided a conceptual replication of experiment 1 findings and extended those accessibility-related findings to the domain of behavior. Experiment 1 had shown that, for impulsive individuals, recalling a past behavior heightens the accessibility of the competing goal and related cognitions. Building on this finding, experiment 2 obtained evidence for a switching effect on actual behavior, such that impulsives are more likely to resist temptation when they recall an earlier act of succumbing rather than one of restraint. In contrast, for nonimpulsives, consistent with our predictions, we found a consistency effect such that recalling a past instance of restraint (vs. succumbing) maintained the likelihood of subsequent resistance.

In a follow-up study, a different set of students at the Hong Kong University of Science and Technology ($N = 193$) went through a similar procedure, with the key exception being that the trait measures were e-mailed to them a week after the main experiment in order to minimize the possibility that the trait responses would be influenced by the behavioral measure. Further, for increased generalizability, a different measure of impulsivity was used, namely, the Behavioral Inhibition Scale/Behavioral Activation Scale (BIS/BAS; Carver and White 1994). While the BIS items did not possess sufficient reliability ($\alpha = .47$), the Behavioral Activation subscale did ($\alpha = .86$); the latter was accordingly used as the measure of impulsivity, with high values on this subscale indicating greater activation, that is, greater impulsivity. Reassuringly, results from this study perfectly mirrored the patterns observed earlier, with even greater levels of statistical significance, possibly due to higher power. A regression using the continuous measure of BAS (mean-centered to reduce multicollinearity) yielded a marginally significant main effect of activation ($b = -1.27$, $t(190) = -1.85$, $p < .07$) qualified by a significant interaction ($b = 2.77$, $t(190) = 3.08$, $p < .01$). Slopes analysis (Aiken and West 1991) showed that, for high-active (i.e., impulsive) respondents, the effect of recall condition was significant ($b = -2.50$, $t(190) = -1.98$, $p < .05$), indicating that they ate fewer cheeseballs when they recalled succumbing to, as compared to resisting, a prior temptation ($M_{\text{resist}} = 3.96$, $M_{\text{succumb}} = 1.46$). In contrast, low-active (i.e., nonimpulsive) respondents ate more cheeseballs when they recalled succumbing versus resisting

earlier ($b = 3.05$, $t(190) = 2.40$, $p < .05$; $M_{resist} = 1.41$, $M_{succumb} = 4.46$). As before, these results were replicated when a dichotomous measure of activation was used instead of the continuous measure. Finally, to address other possible explanations, this study also included measures of ease of recall and specific impulsivity-related emotions such as happiness, guilt, pride, and regret (Mukhopadhyay and Johar 2007) at the time of recall. No significant effects were observed on these measures, thus ruling out the possibility that any of these dimensions were responsible for our observed patterns of behavior.

EXPERIMENT 3: PRODUCT VALUATION AND DEVALUATION

Experiment 3 sought to provide further evidence for our posited process. We have argued that recalling past behaviors leads to activation of nonfulfilled goals among impulsives and increased salience of the fulfilled goal among nonimpulsives. Research has shown that objects or products related to an unfulfilled goal are valued more positively (Ramanathan and Menon 2006). Further, fulfilled goals have a lower value and expectancy (Forster et al. 2005) and hence must lead to devaluation of related objects or products. Therefore, we predicted that impulsives will have lower (higher) evaluations of indulgences after recalling a past act of succumbing (restraint). In contrast, nonimpulsives will evaluate indulgences consistent with their previous behavior—higher if they recalled succumbing and lower if they recalled restraint. Importantly, we further hypothesized that this process of valuation/devaluation mediates subsequent behavior.

Method

Sixty-three undergraduate students at the University of Chicago participated in return for monetary compensation. Prior to the main study, potential participants were sent a short personality questionnaire to complete and return via e-mail. This questionnaire included the Puri (1996) impulsivity scale. Those who responded were requested to participate in a second study after 2 weeks. Here, they completed a product evaluation task where they saw randomly presented pictures of 30 products: five food indulgences (e.g., desserts, pizza), five nontempting foods (e.g., vegetables, green apples), and 20 neutral or unrelated to food (e.g., furniture, batteries). Care was taken not to include any product related to cookies among the indulgences. Each product was evaluated on a 9-point scale (1 = "Dislike very much" to 9 = "Like very much"). Then, as before, participants recalled a recent act of resisting or succumbing to a food temptation. They then performed the evaluation task with the same 30 products, which were again randomly presented. Following these tasks, participants indicated their feelings at that point (1 = "Not at all" and 7 = "Very much) on a set of measures of specific emotions derived from Ramanathan and Williams (2007; positive: pleased, satisfied, excited, proud, strong, determined, happy, confident [$\alpha = .84$]; negative self-conscious: guilty, regretful, ashamed, disgusted [$\alpha = .84$]; negative hedonic: distressed, upset, angry, frustrated, irritable, nervous, sad [$\alpha = .93$]).

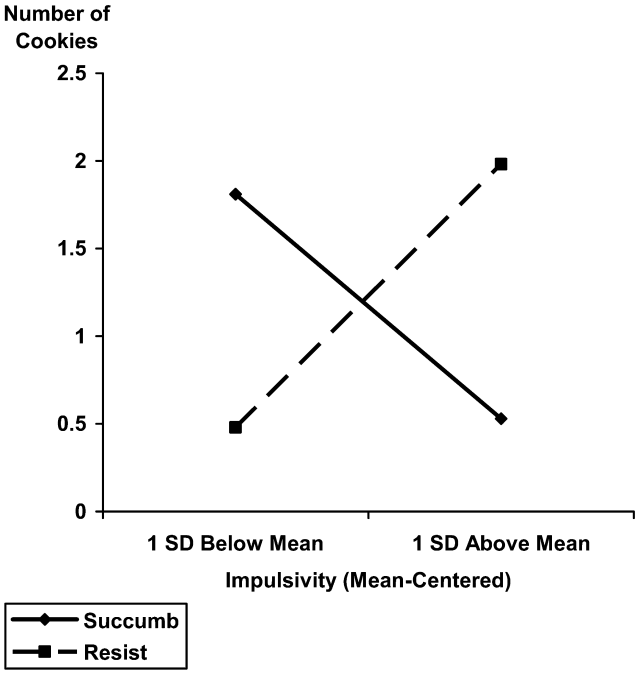
Immediately afterward, all respondents were thanked and informed that they could participate in a second study on personality for additional compensation. They were told that this study needed to be run individually in order to prevent the influence of others on their ratings. Each participant was escorted, one at a time, to a second room. In order to ensure goal activation, care was taken to ensure that no participant had to wait more than 5 minutes. Most participants did not wait at all due to the natural staggering of completion times across individuals. In the center of the table at which participants were seated was a platter of a variety of chocolate-covered/buttery cookies. Cookies were replenished after each participant left the room, so that there were always 25 cookies on the platter. The assistant was coached to say offhandedly, "Oh, there are cookies here! They must be left over from a lab meeting we had a little while earlier." There were no explicit instructions to take or not take the cookies. Participants were left alone for 3 minutes while the assistant pretended to get the questionnaire from an adjacent room. The questionnaire had the same battery of measures that were sent via e-mail to the participants 2 weeks earlier. A test-retest validity test on the impulsivity score from the two sets indicated that the scores were stable and did not change as a result of the manipulations in the study (intraclass correlation = .87). For the purpose of the analysis, we used the time 1 measure of impulsivity ($\alpha = .86$; exactly the same patterns were obtained with the time 2 measure), both as a continuous variable and as a categorical variable based on a median split as before. The assistant recorded the number of cookies the participant had taken after that participant completed the task and left the room.

Results and Discussion

Effects on Behavior. A regression using the continuous measure of impulsivity (mean-centered to reduce multicollinearity) yielded a marginally significant main effect of impulsivity ($b = -.06$, $t(60) = 1.88$, $p = .08$) qualified by a significant interaction between impulsivity and recall condition ($b = .13$, $t(60) = 2.76$, $p < .01$). Slopes analysis (Aiken and West 1991) showed that, for impulsive people, the effect of recall condition was marginally significant ($b = -1.32$, $t(60) = -1.81$, $p < .08$), indicating that such individuals took fewer cookies when they recalled succumbing to, as compared to resisting, a prior temptation ($M_{resist} = 1.81$, $M_{succumb} = .48$). For nonimpulsive people, the effect of recall condition was significant ($b = 1.45$, $t(60) = 2.07$, $p < .05$), indicating that more cookies were taken in the succumb versus the resist condition ($M_{resist} = 1.98$, $M_{succumb} = .53$; see fig. 1). Similar effects were obtained using standard planned contrasts in the context of a 2 (recall condition) × 2 (impulsivity) ANOVA, with impulsivity treated as a dichotomous variable following a median split. A significant interaction between effect was obtained

FIGURE 1

EXPERIMENT 3: EFFECT OF RECALL CONDITION AND IMPULSIVITY ON NUMBER OF COOKIES TAKEN



($F(1,60) = 8.00$, $p < .01$); further, planned comparisons revealed that nonimpulsives took more cookies when they recalled succumbing, versus resisting, a prior temptation ($M_{resist} = 1.74$, $M_{succumb} = .29$; $t(60) = 2.04$, $p < .05$), whereas impulsives took more cookies in the resist, versus succumb, condition ($M_{resist} = 1.89$, $M_{succumb} = .42$; $t(60) = 1.97$, $p = .05$).

These effects cannot be explained by differences in emotions. While impulsives did experience more negative self-conscious emotions ($M_{imp} = 3.09$, $M_{nonimp} = 2.03$; $t(60) = -3.14$, $p < .01$) and less positive emotions ($M_{imp} = 3.77$, $M_{nonimp} = 4.52$; $t(60) = 3.00$, $p < .01$), this effect was not moderated by recall ($p > .66$ for both types of emotions).

Product Valuation/Devaluation. In order to determine whether the recall task influenced goal activation, we computed a difference score for the like/dislike ratings before and after the task for each of the three product categories (food indulgences, food nonindulgences, and nonfood neutral). A 2 × 2 MANOVA crossing recall condition and impulsivity showed no significant main effects, but there was a significant interaction between recall and impulsivity ($F(3,58) = 4.63$, $p < .01$). Follow-up univariate tests showed that the interaction was significant for food-related indulgences ($F(1,60) = 13.06$, $p < .001$) but not for food nonindulgences or nonfood neutral products (F's < 1). Similar results were obtained with the continuous measure of impulsivity for food indulgences (interaction $b = .05$, $t(60) = 3.23$, $p < .01$). Analyses based on a median split showed a pattern mirroring that obtained for the number of cookies. Displaying the predicted switching effect, impulsive people had a positive difference score ($M = .44$), showing that they evaluated indulgences more favorably following the recall task in the resist condition, and a negative score ($M = -.42$) in the succumb condition ($t(60) = 3.15$, $p < .01$). Conversely, nonimpulsives had a negative difference score ($M = -.17$) in the resist condition and a positive score ($M = .33$) in the succumb condition ($t(60) = 1.93$, $p = .06$). Of note, we expected that these patterns should only obtain for evaluations of food-indulgences, which are affected by the relevant goals of restraint and indulgence. Consistent with this, the analyses for food nonindulgences and nonfood neutral products showed no significant effects.

Test of Mediation. Following Baron and Kenny (1986), we entered the difference score for indulgences as an additional predictor into the original regression on number of cookies. The effect of the interaction between recall condition and impulsivity ($b = .13$, $t(60) = 2.76$, $p < .01$) was completely mediated by the difference score (Sobel test $z = 2.58$, $p < .01$), rendering the interaction nonsignificant ($b = .05$, $t(60) = 1.22$, $p > .20$), while the effect of the difference score was highly significant ($b = 1.52$, $t(60) = 4.37$, $p < .001$).

Results from this study thus replicated our earlier findings regarding the effects of recalling past behavior, and they also provided good support for the proposed mechanism. First, using a different measure of goal activation (i.e., the change in attractiveness ratings of indulgences), we replicated experiment 1 regarding switching versus consistency patterns of goal activation following a recall task. Second, we replicated experiment 2 by obtaining the same pattern with regard to behavioral outcomes, again using a different measure (number of cookies taken). Third, and of most importance, our results revealed that the effect of the recall task on behavioral outcomes was mediated fully by the pattern of goal activation. It is worth noting that this mediation cannot be explained by a simple account of preference-behavior consistency. None of the indulgence products used to measure goal activation were related to the cookies that served as the main dependent variable: the constructs were operationally as well as theoretically distinct.

EXPERIMENT 4: ACCESSIBILITY OF REASONS

Experiment 4 was conducted to identify a theory-derived boundary condition for the switching effect observed for impulsives, which contrasts with established consistency effects of recalling past behavior as well with the present findings for nonimpulsives. According to our theorizing, switching should be prevented by inductions that increase the salience of the focal goal, that is, by encouraging recall of not just the prior decision itself but also the reasons for that decision. However, such an induction should not influence

the pattern of behavior for nonimpulsives, for whom salience of a past behavior itself promotes the accessibility of cognitions supporting that behavior. Experiment 4 tested these hypotheses. This experiment also included no-recall control conditions for both impulsives and nonimpulsives. These control conditions were included to facilitate further interpretation of the observed consistency and switching patterns by providing a baseline against which to make comparisons.

Method

The design of this study was similar to that of experiment 2, with one key exception. In addition to recalling a prior instance of when they had resisted or succumbed to a tempting food, some respondents were also asked to recall the reasons for that decision. Hence, the content of recall (decision-only vs. decision-with-reasons), was introduced as a third factor. This study thus took the form of a 2 (recalled prior behavior: resist vs. succumb) × 2 (content of recall: decision-only vs. decision-with-reasons) with impulsivity as an added measured independent variable. There was also an additional control condition where respondents did not recall any prior decision. Four hundred and twenty-three undergraduate students at the Hong Kong University of Science and Technology participated in return for course credit. The procedure was similar to that of experiment 2, except that a hypothetical choice between cake and fruit salad was the only dependent measure in this experiment.

Results and Discussion

The items on the Puri impulsivity scale ($\alpha = .80$) were averaged to form a composite measure and entered in a binary logistic regression on the choice of cake versus salad (coded 0 and 1, respectively), using impulsivity, prior decision, content of recall, and all interactions as predictors. The model had a good fit ($\chi^2(7) = 18.55$, $p < .05$), with significant interactions between prior decision and content of recall (Wald(1) = 5.67, $p < .05$), content of recall and impulsivity (Wald(1) = 4.78, $p < .05$), and a three-way interaction (Wald(1) = 3.72, $p < .05$). Slopes analyses (Aiken and West 1991) revealed an interesting pattern of effects (one-tailed tests are presented below where noted, since these predictions were supported in the previous studies). When only the prior decision was recalled (i.e., without accompanying reasons), findings were similar to those in experiment 2. Among impulsives, those who recalled having resisted a temptation were directionally less likely to choose salad; that is, they were more impulsive than those who recalled having succumbed ($b = -.09$, $t(319) = -1.57$, $p < .06$, one-tailed). In contrast, nonimpulsives who recalled having resisted were directionally more likely to choose salad than those who recalled having succumbed ($b = .08$, $t(319) = 1.37$, $p < .10$, one-tailed). Of more interest for this study was the pattern that emerged when reasons for the prior decision were elicited along with the decision itself. As expected, no difference in results was obtained for nonimpulsives—they continued to display consistency, with those who recalled resisting being less likely to choose cake than those who recalled succumbing ($b = .12$, $t(319) = 1.96$, $p < .05$). However, among impulsives, recalling the reasons along with the prior decision caused a sharp reversal. Those who recalled having resisted were now significantly less likely to choose the cake than those who recalled having succumbed ($b = .13$, $t(319) = 2.18$, $p < .05$). This reversal provided strong support for the hypothesized moderating effect of recalling reasons.

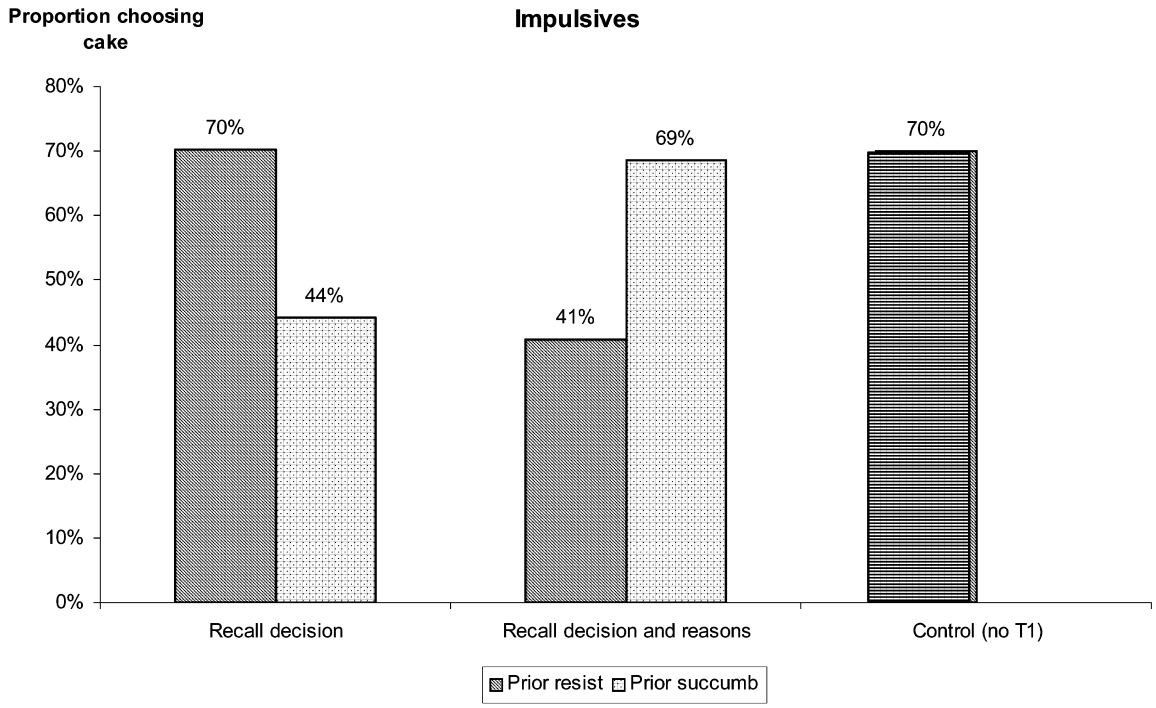
We conducted an analysis of proportions based on a median split on impulsivity to better understand these results (see fig. 2). When only the prior decision was recalled, impulsives who recalled having resisted (vs. succumbed) were significantly more likely to choose the cake rather than the salad ($M = 70\%$ vs. $M = 44\%$; $t(77) = 2.45$, $p < .05$). In contrast, nonimpulsives who recalled having resisted were less likely to choose the cake than those who recalled having succumbed ($M = 45\%$ vs. $M = 69\%$; $t(76) = -2.24$, $p < .05$). When reasons were elicited along with the decision, nonimpulsives continued to display consistency, with those who recalled resisting (vs. succumbing) being less likely to choose cake ($M = 41\%$ vs. $M = 62\%$; $t(79) = -1.98$, $p < .05$). In contrast, impulsives who recalled having resisted (vs. succumbed) were significantly less likely to choose the cake ($M = 41\%$ vs. $M = 69\%$; $t(74) = -2.56$, $p < .05$).

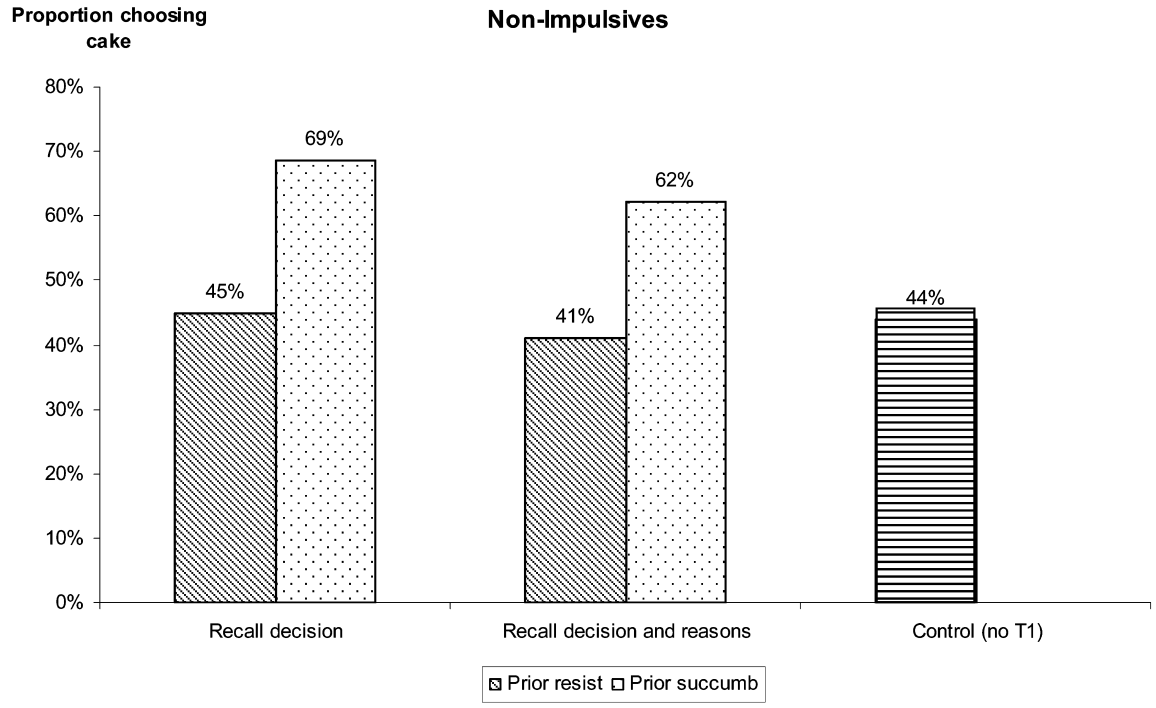
Further insights were provided by the no-recall control conditions, in which respondents were exposed to the choice between cake and fruit salad without recalling any previous food-related temptations. At this baseline state, impulsives were significantly more likely than nonimpulsives to opt for cake ($M = 70\%$ vs. $M = 44\%$; $t(91) = -2.72$, $p < .01$). This result in itself is not surprising; it is akin to a reality check on the experimental paradigm. Comparisons with the behavior-only recall conditions provided results of more interest, since they shed additional light on the switching and consistency effects. These comparisons showed that, among impulsives, recalling a prior decision to succumb caused them to succumb less than in the no-recall condition ($M = 44\%$ vs. $M = 70\%$; $t(86) = 2.56$, $p < .05$). However, recalling a prior decision to resist led to similar levels of succumbing as in the baseline no-recall condition with its already high level of succumbing ($M = 70\%$ vs. $M = 70\%$; $t < 1$, NS). A different pattern was observed for nonimpulsives. Supporting the consistency thesis, the proportion choosing cake was significantly higher when participants recalled an earlier instance of succumbing than in the no-recall case ($M = 69\%$ vs. $M = 44\%$; $t(75) = 2.34$, $p < .05$). Moreover, recalling an earlier instance of restraint led to similar levels of restraint as in the no-recall case ($M = 45\%$ vs. $M = 44\%$; $t < 1$, NS). These results point up the difference between impulsives and nonimpulsives—the latter group display consistency and behave "as usual" when reminded of their normal state of affairs; however, bringing to mind past transgressions can have an adverse effect as they use that signal to continue indulging.

These results replicated our earlier findings by showing that recalling their decision about a prior temptation caused

FIGURE 2

EXPERIMENT 4: PROPORTIONS CHOOSING CAKE OVER SALAD





impulsives to switch and nonimpulsives to display consistency. Comparisons with no-recall control conditions provided convergent evidence for these conclusions. Of more interest, these results documented an important boundary condition for the switching effect obtained for impulsive individuals. We had reasoned that increasing the salience of the focal goal at the point of the current decision, that is, encouraging participants to recall the reasons for their prior behavior, should operate against the switching effect. Strong support was obtained for this thesis: in the reasons-recall conditions, rather than exhibiting a switching effect, impulsives displayed a consistency effect such that recalling a prior decision to resist (vs. succumb) actually increased the likelihood of current resistance. Also as expected, recalling reasons for the prior behavior did not change the pattern of results for nonimpulsives.

GENERAL DISCUSSION

This research reports on how recall of a past behavior given a food-related temptation differentially affects impulsive versus nonimpulsive individuals when they are faced with a similar current temptation. Results from four experiments demonstrate that the goal conflict between restraint and desire that characterizes impulsives manifests itself in "switching" when past behavior is recalled: resisting when they recall having given in, and vice versa. For nonimpulsives, the relative lack of goal conflict leads to the usual "consistency" that has been documented in past research (e.g., Albarracin and Wyer 2000): recalling a past behavior increases the accessibility of cognitions supportive of that behavior, causing it to be repeated. Experiment 1 showed that recalling a past behavior increased the accessibility of opposing cognitions for impulsive individuals but of supportive cognitions for nonimpulsives. Experiments 2–4 then built upon this finding to demonstrate a switching effect on behavior for impulsives and a consistency effect for nonimpulsives; supportive evidence was also obtained for the mediating role of goal activation on behavior. Finally, experiment 4 identified a boundary condition for the switching effect: encouraging impulsives to think of the reasons for their prior behavior operated against the switching effect and instead produced the type of consistency exhibited by nonimpulsives. These four experiments, run in two locations with participants from different cultures and using several different dependent variables, provided strong convergent support for our hypotheses. We would like to note that, while some of the slopes analyses that we conducted had yielded marginal or directional results, a meta-analysis of these slopes across all studies (Winer 1971) showed highly significant results for both impulsives ($z = 4.98$, $p < .0001$) and nonimpulsives ($z = 4.30$, $p < .0001$), attesting to the robustness of the observed effects.

Most previous literature on impulsive behavior has focused on a static snapshot in time, looking at single acts of indulgence (e.g., Hoch and Loewenstein 1991; Shiv and Fedorikhin 1999). Yet, very often, problems in self-control result not from single failures but from repeated indulgence. It is therefore important to understand the likelihood of indulgence conditional upon previous acts of indulgence or resistance. While there is growing interest in studying repeated behaviors, extant research has primarily documented either consistency (e.g., Dhar, Huber and Khan 2007) or switching (e.g., Dholakia, Gopinath, and Bagozzi 2005; Khan and Dhar 2006) but not both types of behavior. We believe that our current research represents an advance over the above studies, most importantly, because it is the first to present a comprehensive model encompassing both consistency and switching, showing that the likelihood of observing consistency or switching depends on the nature of activated goals and associated cognitions and that this is moderated by personality type. Further, we demonstrate that the switching effects for impulsives can go both ways, with prior resistance leading to a greater likelihood of succumbing, but also vice versa. Finally, we demonstrate these effects within the same category across time periods.

Our findings may cue prior research (Dhar and Simonson 1999), which argues that when consumers make trade-offs between two different goals *within a consumption episode* (emphasis added), they tend to "balance" choices that serve each goal, causing switching. However, when making trade-offs between a goal and a resource such as money or time, they tend to "highlight" one choice, leading to consistency. Notably, Dhar and Simonson's research does not provide a process-level explanation of these effects, while our research seeks to do so by demonstrating a goal-activation mechanism. Further, their research does not examine the effects of impulsivity, while we derive theory-based predictions for different patterns of behavior by impulsives and nonimpulsives. Finally, Dhar and Simonson did not find differences in temporally separated choices. Our results show that even temporally separated episodes can result in switching or consistency, as recalling a past episode can bracket it with the present instance and lead to divergent behavior for impulsives and nonimpulsives. Impulsives may indeed engage in balancing, with the recall of satisfying one goal leading to pursuit of the other, but this does not occur for nonimpulsives, who remain consistent despite not having made any trade-offs between goals and resources.

Another interpretation of our findings is that recalling a past action may cause inferences of goal progress or commitment (Fishbach and Dhar 2005; Fishbach, Dhar, and Zhang 2006). In this view, people with multiple goals may switch to an alternative goal when they infer adequate progress being made on a focal goal or subgoal, while those who infer goal commitment to superordinate goals from their past actions continue pursuing the same course. Importantly, Fishbach and Dhar (2005) suggest that commitment results from viewing the pursuit of a focal goal as a defining characteristic of one's self-concept. We show that this is not necessarily the case—nonimpulsives, for whom succumbing to temptation is not part of their self-concept, nevertheless yield to temptation after recalling a similar prior act.

Our research also differs from the ego-depletion model of self-regulation, which argues that failures of self-control are due to resources being used up on preceding choice tasks that are difficult (Muraven and Baumeister 2000). It is unlikely that our respondents felt depleted, since they do not actually engage in a prior choice but merely recall past choices made. Moreover, if recalling a previous act is depleting, it should have similar effects for both impulsive and nonimpulsives, which we do not obtain. Most important, we not only observe the type of switching that has been documented in the depletion literature, namely, resistance followed by succumbing, but we also observe the other form of switching, that is, succumbing followed by resistance.

It is important to note that our demonstration of the switching effect for impulsives, while drawing on the literature on the effects of goal fulfillment, also contributes to it. Research in this area has shown that, given goal conflict, performing a behavior that fulfills one of the goals leads to that goal being inhibited and the competing goal being made salient; subsequent behavior is then likely to be guided by the competing goal (Forster et al. 2005; Marsh et al. 1998). Our results add to this by showing both that such switching effects do not obtain for individuals who are less prone to goal conflict (e.g., nonimpulsives) and that, for more conflicted individuals (impulsives), switching effects can obtain simply by recalling prior behaviors.

Limitations and Future Research

From a practical perspective, it is important to influence the behaviors of vulnerable populations at the time that they are actually faced with temptation. Our studies manipulated recall before participants were presented with the behavioral task. Performing the recall task in the presence of the temptation could potentially have different effects, though it would be difficult to tease apart the cognitions emanating from the past behavior and those arising from the present context. However, manipulating attentional focus at the time of temptation may well reveal interesting boundary conditions. Moreover, it would be interesting to see whether longer delays between behaviors have different effects from those observed. It is possible that impulsive people may then show consistency, especially when giving in to temptation, because they may no longer bracket the two instances and hence revert to baseline states. Our framework presents a two-period model of behavior, and it is not clear whether such patterns would extend to a multiperiod situation. A study of the underlying dynamics of goal states could help shed light on this important issue. Finally, while we obtained convergent results across four experiments involving very different dependent variables, our investigation was restricted to food. Our model predicts that similar effects should be observed in other relevant domains. However, this question needs to be tested empirically and also across different domains of consumption.

Implications for Consumer Welfare

Given that impulsive people, particularly those who are prone to act rashly when distressed, are the ones who normally binge eat (Fischer, Smith, and Anderson 2003), our results provide very specific suggestions on how to help them restrain their eating. We show that, when they are exposed to temptation, making them think back to past success at self-regulation can have an ironic effect, allowing them to let go. Self-help books are replete with examples of how people managed to resist temptations by focusing on past successes, but there is evidence that many diet plans that start with initial successes end in failure (e.g., Heatherton, Polivy, and Herman 1991). Our research makes the novel prediction that overeaters are best restrained from eating by making them recall a prior episode of indulgence. Thinking back to a time when one gave in seems to strengthen resistance; hence, thinking about failure may ironically beget success.

Our results also show that rumination about the causes for failure may lead to further failures. Hence, interventions designed at motivating overeaters to regulate themselves must be carefully designed with three guidelines in mind. First, they should direct attention to a previous instance of failure while avoiding any wallowing in the misery of failure. Second, they should alternately direct attention to the reasons for a prior success. It is important to note that thinking of reasons for prior resistance, rather than merely recalling these acts, helps impulsives to resist again. Thus, interventions should motivate overeaters to consider how and why they managed to resist. Finally, interventions should encourage focus on the likelihood of future success.

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