Spent Resources: Self-Regulatory Resource Availability Affects Impulse Buying

KATHLEEN D. VOHS
RONALD J. FABER*

This research investigated impulse buying as resulting from the depletion of a common—but limited—resource that governs self-control. In three investigations, participants' self-regulatory resources were depleted or not; later, impulsive spending responses were measured. Participants whose resources were depleted, relative to participants whose resources were not depleted, felt stronger urges to buy, were willing to spend more, and actually did spend more money in unanticipated buying situations. Participants having depleted resources reported being influenced equally by affective and cognitive factors and purchased products that were high on each factor at equal rates. Hence, self-regulatory resource availability predicts whether people can resist impulse buying temptations.

Modern Western societies provide ever-increasing opportunities for impulse spending. Years ago, consumers might have seen an interesting product advertised while watching television or flipping through a magazine one evening. If tempted, however, they would generally have had to wait at least until the next day to act on this desire. This imposed delay may have served a highly useful purpose insofar as it aided in preventing situational factors from governing purchasing behavior. Such developments in technology as cash machines, shop at home television programs, and Internet shopping now render urges to act immediately and buy around the clock highly difficult to resist.

Has the new technology changed the rate and frequency of impulsive buying? Recent figures suggest that the answer is yes: the ratio of household debt to disposable income in the United States is at an all-time high and continues to climb (Federal Reserve 2003; Federal Reserve Bank of Cleveland 1997), impulse purchasing being a hefty chunk of spending (Bellenger, Robertson, and Hirschman 1978). The unending stream of immediate consumption opportunities—and evidence that consumers regularly succumb to the temptations they represent—make it all the more imperative for consumer scientists to better understand the situational factors that determine impulse buying.

*Kathleen D. Vohs is assistant professor of marketing, Marketing Department, Carlson School of Management, University of Minnesota, 321 19th Ave. S, Minneapolis, MN 55455 (kvohs@csom.umn.edu). Ronald J. Faber is professor of advertising and mass communication, School of Journalism and Mass Communication, University of Minnesota, 111 Murphy Hall, Minneapolis, MN 55455 (faber001@umn.edu). This research was supported in part by grant MH12794 from the National Institutes of Health, as well as Canada Research Chair funds for Marketing Science and Consumer Psychology to the first author. The authors gratefully acknowledge Nicole Mead, Melissa Lassiter, Sloane Rampton, Karyn Cirino, Neil Van Den Berg, Christy Taylor, and Lily Lin for their assistance in conducting the studies included in this article. The authors are grateful to the reviewers, the associate editor, and Dawn Iacobucci for their helpful comments on an earlier draft.

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IMPULSE SPENDING

Early research used the terms *impulse buying* and *unplanned buying* synonymously (Kollat and Willett 1969). This conceptualization led researchers to classify products in terms of whether they were likely to be purchased impulsively (e.g., Applebaum 1951). By the 1970s, however, researchers had begun to question whether products could reasonably be classified as impulse items and concluded that all products could be purchased impulsively.

In the 1980s, important works by Rook (1987) and Rook and Hoch (1985) clarified the nature of impulse buying. Rook and Hoch (1985, 23) aptly noted, "It is the individuals, not the products, who experience the impulse to consume." This statement led to a redefinition of impulse buying as a sudden and powerful urge that arises within the consumer to buy immediately (Beatty and Ferrell 1998; Rook 1987). Impulsive purchasing was now defined as involving spontaneous and unreflective desires to buy, without thoughtful consideration of why and for what reason a person should have the product (Rook 1987; Rook and Fisher 1995; Verplanken and Herabadi 2001). Recent research has reflected this viewpoint by distinguishing between people who are "impulsive buyers" and those who are not (Rook and Fisher

1995; Youn and Faber 2000). Although such effort is valuable, it obscures the facts that almost everyone engages in occasional impulse spending and that even identified impulse buyers can and do control their impulses at times.

One factor that has been found to influence impulsive buying is affect. When asked to name the single mood that most often preceded an impulse purchase, respondents most frequently mentioned "pleasure," followed by "carefree" and "excited" (Rook and Gardner 1993). Impulsive buying when in a negative mood is also common (Rook and Gardner 1993). Shoppers in negative moods may be actively attempting to alleviate the unpleasant mood (Elliott 1994). This explanation for impulse shopping is consistent with findings on self-gifting, a behavior often motivated by attempts to cheer oneself up or be nice to oneself (Mick and Demoss 1990).

Perhaps the most compelling explanation for why people engage in impulse buying was presented by Hoch and Loewenstein (1991) in their writing on time-inconsistent preferences. According to this view, consumer decisions represent an ever-shifting conflict between desire and willpower. When desire for a product outstrips consumers' intentions not to make the purchase, impulse buying can result. This conceptualization highlights the two separate mechanisms involved in impulsive spending: (1) the desire to buy and (2) the ability to exercise control over this urge.

Prior work on impulse buying has stressed factors that influence desire for goods. For example, physical proximity can stimulate sensory inputs that affect desire. Touching products in a store, tasting free samples of food, sniffing enticing aromas, or test-driving a luxury automobile can enhance desire to purchase a good (Faber and Vohs 2004). A recent analysis by Belk and colleagues (Belk, Ger, and Askegaard 2003) provided a multifaceted portrait of desire, noting that desire has its roots in motivation, historical and society trends, and, ultimately, morality.

In contrast, the current approach focuses on the role of self-control (compare to willpower) in impulsive spending. Past research has shown that, at the trait level, being controlled (as opposed to being impulsive) is negatively related to impulse buying (Youn and Faber 2000) and positively correlated with the percentage of personal income saved (Romal and Kaplan 1995). Previous work was encouraging insofar as it suggested that generally having good self-control helps consumers not to buy impulsively; methodologically, however, the lack of manipulated variables in these studies left open possible alternate explanations. Accordingly, a direct test of the causal role of self-control in impulse buying must be conducted at the "state" level.

SELF-REGULATORY RESOURCE DEPLETION

In the past decade, new ideas and innovative theories have brought about an upsurge in the field's understanding of self-regulatory processes. We think of self-regulation as having three core ingredients (Baumeister et al. 1994; Vohs, Baumeister, and Tice 2006): establishment of goals or standards, monitoring one's distance from current status to the desired end point, and operations that move the self from current to desired state. There has been a wealth of research on how people set goals and how they recognize and respond to goal discrepancies. Until recently, however, there has been little theory or research on what enables people to progress toward goal attainment once the goal is established.

A limited-resource model has been proposed to describe the mechanism that enables people to progress from their current state to the desired end state (Baumeister and Heatherton 1996). In this model, self-regulatory resources are theorized to allow people to substitute an undesirable response with a more desirable response. Self-regulatory resources are seen as diverse and have been found to be recruited across a variety of diverse domains during goal activity. The reservoir of regulatory resources is, however, finite and, consequently, regulatory resources become temporarily depleted or fatigued by situational self-control demands. This tenet predicts that immediately after having exerted self-control a person may be unable to draw upon enough regulatory resources to reach a subsequent goal, such as the goal to spend prudently (i.e., not impulsively).

Empirical tests have shown that self-regulatory resources underlie a wide range of behaviors across a variety of domains, including overeating, procrastination, intellectual underachievement, and self-presentation (e.g., Baumeister et al. 1998; Vohs, Baumeister, and Ciarocco 2005; Vohs and Heatherton 2000; Vohs and Schmeichel 2003; Vohs 2006 provides a review). For example, in one investigation, dieters who were seated next to a bowl of tempting candies were later less able to persist in doing a difficult task than were dieters who sat further away and, therefore, were less tempted (Vohs and Heatherton 2000). Thus, exerting self-control by having to resist the temptation in one setting rendered dieters less capable of exerting self-control in a subsequent task. We propose that the factors that lead to the depletion of self-regulatory resources may help to explain when and why specific episodes of impulse buying will occur. In the current studies, we tested the hypothesis that exerting regulatory resources in an initial self-control task subsequently leaves people less able to resist the impulse to buy.

EXPERIMENT 1

Willpower-based strategies for limiting consumption often involve making economic cost assessments (Hoch and Loewenstein 1991). In a study of consumers' self-generated strategies for restraining the urge to buy impulsively, among the most common tactics were lowering one's valuation of the product—that is, perceiving the product as not being worth its stated price—and considering the economic costs of a purchase (Rook and Fisher 1995). We hypothesized that diminished self-regulatory resources would limit the ability to apply these control strategies on impulse buying and would hence lead to a willingness to pay more for potential purchases.

TABLE 1

INDICES OF IMPULSIVE SPENDING AS A FUNCTION OF SELF-REGULATORY RESOURCE CONDITION: RESULTS FROM THREE EXPERIMENTS

	No depletion condition	Self-regulatory resource depletion condition	Dependent variable
Experiment 1	$22,789.61 ($7,865.56)	$30,037.12 ($7,305.72)	Willingness to pay
Experiment 2	1.21 (1.90)	4.05 (2.52)	Impulse purchasing (dollars)
Experiment 2	1.65 (2.64)	3.12 (2.90)	Impulse purchasing (quantity)
Experiment 3	1.35 (.93)	4.99 (2.80)	Impulse purchasing (dollars)
Experiment 3	3.21 (1.32)	6.20 (2.76)	Impulse purchasing (quantity)

NOTE.—The data in this table are means and standard deviations (inside parentheses) relating to the effect of self-regulatory resource depletion condition on impulsive spending. Higher numbers in the dependent measure column indicate greater impulsive spending tendencies. Rows denote the experiment from which the means were drawn. The second and third columns show the means for the no resource depletion condition and self-regulatory resource depletion condition, respectively, and the dependent variable column specifies the operationalizations of impulsive spending in each experiment.

Method

Thirty-five undergraduates (16 men, 19 women) at Case Western Reserve University participated in exchange for partial course credit. Participants came to the lab individually, where they were told that they were going to be in one psychology experiment and then one marketing experiment. As part of the purported psychology experiment, participants were asked to watch a 6 minute videotape, without audio, of a woman being interviewed under the guise that they would make personality judgments about the interviewee later. In addition to the woman being interviewed, a series of common, one-syllable words (e.g., *play*, *tight*, *greet*) were presented at the bottom of the screen for 30 seconds each.

To manipulate self-regulatory resource demand, participants were given different instructions about how to direct their attention during the video. Participants in the "no control" condition were given no instructions regarding the irrelevant words at the bottom of the screen. Participants in the "attention control" condition were instructed "not to read or look at any words that may appear on the screen. If you find yourself looking at the words, immediately reorient your attention toward the woman's face." Following the video, participants completed the state version of the positive and negative affective schedule (PANAS; Watson, Clark, and Tellegen 1988) as a measure of state emotion.

Following the video, participants were told that they were going to be taking part in a marketing study to determine the prices that students would pay for various products. Price assignment has been shown to be sensitive to situational manipulations (Feinberg 1986), with a recent meta-analysis demonstrating a mean agreement ratio of 0.89 between willingness-to-pay reports and actual paying behaviors (Carson et al. 1996). For this task, participants perused 18 color images of products and listed the price that they would be willing to pay for each product. The images depicted mid- to high-priced products, such as watches, stoves, boats, and cars. We chose these products because (1) they allowed for sufficient variance in the plausible range of prices in order to maximize sensitivity to differences in willingness to pay and (2) our college student participants would not have crystallized (factual) knowledge of exact prices for these types of products. In this way, participants' price assignments would not reflect a regurgitation of actual information but instead would be an indication of valuation. After completing the price-assignment task, participants completed a postexperiment questionnaire, were debriefed, and were dismissed.

Results

Manipulation Checks. Ratings of task difficulty showed that the manipulation varied demands on self-regulation ($t(33) = 5.89$, $p < .001$). Attention-control participants rated their task as significantly more difficult ($M = 5.77$, SD = 2.86) than no-control participants ($M = 1.61$, SD = 0.85). As expected, participants' mood states were unaffected by the video-watching task for both the positive affect (PA) and negative affect (NA) scores ($t < 1$).

Price Assignments. Our goal was to test the prediction that willingness to pay would be higher when people were depleted of self-regulatory resources. We aggregated the price assignments for the 18 items into an overall pricing index and then subjected this index to a *t*-test. As predicted, there was a significant effect of depletion condition ($t(33) = 2.82$, $p < .01$). As seen in table 1, participants in the attention control condition assigned significantly higher prices to the 18 products than did participants in the no control condition (no control: $M = \$22{,}789.61$, SD = \$7,865.56; attention control: $M = \$30{,}037.12$, SD = \$7,305.72).

Discussion

The results from experiment 1 indicate that if a person is temporarily robbed of self-regulatory resources, their valuation of goods is higher and hence the point at which a product becomes prohibitively expensive is also higher. Using a simulated buying task (Feinberg 1986), we found that participants who had controlled their attention in an earlier task were later willing to pay higher prices for a variety of products, as compared to participants who had not earlier engaged in self-control. Since the only factor that varied with condition was the instruction to control attention, it appears that this effort taxed the self-regulatory resources available for the following task and led to a willingness to pay more for potential purchases.

EXPERIMENT 2

Experiment 2 was conducted to accomplish three goals. The first goal was to show that self-regulatory resource depletion affects actual buying behavior. A second goal of experiment 2 was to demonstrate that a different type of self-regulation task would drain regulatory resources and consequently influence impulse buying. Recall that experiment 1 manipulated attention control, whereas in experiment 2 participants engaged in a task that required mental control.

The third goal of experiment 2 was to integrate the notions of state and trait impulsivity. We assumed that virtually all people want to curb spending to some degree, particularly when tempted by unplanned, unnecessary purchases. However, research indicates that people vary in their trait propensity toward impulse buying (Rook and Fisher 1995). Therefore, in the current and ensuing experiment, we differentiated between participants who are generally tempted by impulsive spending versus those who are less impulsive in their spending. We expected to find an overall effect of resource depletion for both groups, but we hypothesized that a loss of self-regulatory resources would exert an even stronger effect on the spending of participants who typically are impulsive in their buying tendencies than those with weak impulse-buying tendencies. This is expected to occur because people who have high tendencies toward impulsive spending must exert greater control over these urges when in buying situations; therefore, a disabling of their restraints will unleash a particularly strong underlying impulse to spend. Those who are low on the trait of impulsive buying are also expected to buy more when their regulatory resources are depleted, but the impact of depletion will not be as great as it will be among participants who need more to reign in their impulses (i.e., buyers who are high on the trait of impulse buying). Thus, we predicted both a main effect of depletion condition and an interaction between depletion condition and general buying impulsiveness in predicting actual amount of money spent as well as number of items purchased in an impromptu buying situation.

Method

Seventy undergraduates at University of Utah and University of British Columbia (24 men, 46 women) participated individually in experiment 2 in exchange for extra course credit. The data from two participants were incomplete and therefore were not used. Participants were told that the first part of the experiment was investigating thoughts as they occur naturally in people's minds. They then completed the trait Buying Impulsiveness Scale (BIS; Rook and Fisher 1995), which measures generalized urges to spend impulsively.

Next, participants in the thought suppression condition were told that, for the next few minutes, they would be writing down all the thoughts that entered their mind, with one exception: participants were told not to think about a white bear (Wegner 1989). Participants were told that, if they thought of a white bear or if a white bear image popped into their heads, they were to place a check mark on the side of their paper and continue writing their thoughts. Participants in the no suppression condition were told to write their thoughts for the next few minutes, but this group was told that they were allowed to think about anything they wanted, "including a white bear." Both groups were given 6 minutes to write out their thoughts. After the thought-listing task, participants completed the PANAS (Watson et al. 1988) as a mood measure.

Subsequently, participants were told that they would be taking part in a second study that involved the introduction of new products at the university bookstore. Participants were informed that, in exchange for their participation, they would receive $10, which they could either leave with at the end of the experiment or use any or all of to buy products that were available as part of the bookstore's product study. We emphasized that the bookstore was interested in knowing whether students would actually buy these products, and consequently they were free to choose whether to purchase anything at all. Participants were told that, if they did choose to purchase, they could do so in whatever quantities they wished because there was additional inventory in another room. Participants were presented with 22 products, ranging from gum and candy to coffee mugs and playing cards. The items cost as little as $.33 and as much as $4.57 apiece. Any spending here would be unplanned since participants were unaware of the purchasing situation in advance. Thus, this was a reasonable representation of an impulsive spending situation.

Results

Manipulation Checks. Again, as expected, the thought listing task was rated as more difficult by those in the thought suppression group compared to those in the no suppression group ($t(66) = 3.68$, $p < .001$; $M = 4.06$, SD = 2.07 vs. $M = 2.32$, SD = 1.80). We also checked that our manipulation did not alter participants' mood (positive and negative affect), which it did not (PA and NA, $ts < 1$).

Buying Behavior. It was hypothesized here that the

greater impulsive buying tendencies after depletion found in study 1 would also hold for actual purchasing behaviors. We found support for this hypothesis in a *t*-test on amount of money spent as a function of self-regulatory resource condition ($t(64) = 5.26$, $p < .001$). As seen in table 1, participants who experienced a loss of self-regulatory resources through thought suppression spent more of their newly acquired money than did participants whose resource supply was intact. An analysis of the quantity of items purchased revealed a similar pattern: participants who were in the regulatory resource depletion condition bought more items than participants who were not drained of their self-regulatory resources. These results provide behavioral evidence, in terms of items purchased and dollars spent, to support our thesis that self-regulation is a determinant of impulsive buying patterns.

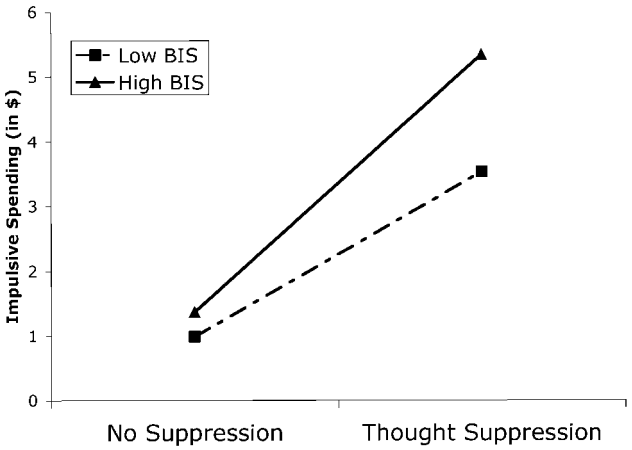
The second hypothesis for experiment 2 was that, when regulatory resources are diminished, people who are prone to impulsive overspending will show greater impulsive spending than those who are generally more restrained. To test this, we conducted regression analyses in which BIS scores (centered) were multiplied by condition; this interaction, along with the main effects of BIS scores and depletion condition, were entered into models to predict impulsive purchases.

The results of these models were consistent with our predictions. First, we found a significant interaction between self-regulatory resource depletion condition and BIS scores in predicting amount of money spent in the buying situation ($t(64) = 2.00$, $p = .05$, $\beta = .20$; see fig. 1). This result revealed that the higher a participant's BIS score, in combination with being in the thought suppression condition, the more money was spent. There was also a significant effect of resource depletion ($t(64) = 5.94$, $p < .01$, $\beta = .60$), as well as an effect of BIS scores ($t(64) = 2.34$, $p < .05$, $\beta = .24$), on amount of money spent. Within-cell comparisons revealed that both low- and high-BIS participants experienced a disinhibiting effect of regulatory resource depletion on spending; moreover, this effect was strongest among high-BIS participants. Specifically, for low-BIS participants (formed using a median split), being in the thought suppression condition significantly predicted amount of money spent ($r(38) = .51$, $p < .001$); this association between depleted resources and spending was even larger among high-BIS participants ($r(30) = .65$, $p < .001$). Analyses of the quantity of items purchased also reflected significant main effects of BIS scores ($t(66) = 3.28$, $p < .01$, $\beta = .38$) and self-regulatory resource depletion condition ($t(66) = 3.03$, $p < .01$, $\beta = .35$). However, the condition by BIS interaction was not significant.

Feelings of Temptation. After participants completed the buying task, we assessed how tempted they had been to spend all the money they were given. Participants rated their temptation to spend all of their newly gained money on a Likert scale with end points of 1 (not at all) to 7 (very much so). In a regression analysis with all three predictors (the two main effects and their interactions), we found a main effect of depletion condition ($t(64) = 3.23$, $p < .01$, $\beta = .35$), such that resource-depleted participants felt more tempted than non-resource-depleted participants, and we also found a main effect for BIS scores ($t(64) = 3.00$, $\beta = .33$). Notably, the BIS × condition interaction was significant ($t(64) = 2.54$, $p < .05$, $\beta = .27$). An examination of the means revealed that the highest temptation occurred among high-BIS scorers in the thought suppression condition (low BIS scores/no control condition: $M = 2.50$, SD = .85; high BIS scores/no control condition: $M = 2.95$, SD = 1.15; low BIS scores/thought suppression condition: $M = 3.21$, SD = 1.98; high BIS scores/thought suppression condition: $M = 5.00$, SD = 2.05).

FIGURE 1

AMOUNT SPENT IN THE BUYING SITUATION AS A FUNCTION OF SELF-REGULATORY RESOURCE CONDITION AND BUYING IMPULSIVENESS SCORES, EXPERIMENT 2



NOTE.—No Suppression stands for random assignment to a condition in which no self-control demands are placed on the subject. Thought Suppression stands for random assignment to a condition wherein participants are asked to suppress thoughts of a white bear during a thought-listing exercise. Low BIS and High BIS are categories of participants on the basis of their buying impulsiveness scores (Rook and Fisher 1995), which was split at the median for illustrative purposes. Impulsive Spending (in $) is the mean amount of dollars spent during a buying impulsive spending situation.

Discussion

In experiment 2, we replicated and extended the findings of experiment 1 by showing that spontaneous buying behavior was predicted by self-regulatory resource depletion. In addition, this study demonstrated that the interaction of dispositional buying impulsiveness and self-regulatory resource condition predicted impulsive spending. Among people who are prone to buying impulsively, temporary lapses in self-control ability signal a strong possibility that impulsive, unplanned, and perhaps unwanted spending may occur.

EXPERIMENT 3

In experiment 3, we sought to distinguish our self-regulatory resource explanation of spending from a model proposed by Shiv and Fedorikhin (1999). In their model, Shiv and Fedorikhin view self-control as occurring when cognition determines behavior more than does emotion. They provided support for this idea by showing that, when participants' cognitive resources were highly taxed (compared to less taxed) there was a greater preference for an affectively laden choice alternative (chocolate cake) over a cognitively laden choice (fruit salad). While we admire and build upon their work in many ways, the regulatory resource model that we use differs from their cognitive-affective model in several important ways.

First, their model is concerned only with availability of cognitive resources during a consumption decision. The self-regulatory resource model posits that self-regulation involves broader, more global, resources that oversee a wealth of different self-control acts. Depletion of any domain that makes up this generalized resource (e.g., attention control, emotion modulation, and behavioral guidance, as well as basic mental control) will negatively affect self-control and lead to stronger impulsive buying behavior. Experiments 1 and 2 showed that the depletion of attention and cognitive resources (thought suppression) increases subsequent impulse buying behaviors. In experiment 3, we sought to expand the confidence in this model by using an emotional-behavioral control task to deplete self-regulatory resources. This would serve to further demonstrate our belief that the control of impulsive behavior (namely, spending) is dependent on a broad pool of resources and not just on cognition as suggested by the Shiv and Fedorikhin model.

A second difference is that Shiv and Fedorikhin's model depicts cognitive resources as determining consumption choices at the moment of the purchase decision. Their use of a cognitive load implies that consumers must be actively considering or reciting information at the moment of the consumption decision in order for their model to predict behavior. Conversely, our model is a "hangover" model that predicts current impulsive spending as a result of having earlier engagements in self-regulation. Thus, any activity that precedes buying can be viewed as potentially influencing the likelihood of impulse buying. On this dimension, too, our model is far broader than the model proposed by Shiv and Fedorikhin.

Third, our model differs from Shiv and Fedorikhin's model in terms of what each model seeks to predict. Shiv and Fedorikhin examined alternative product choice, whereas our model predicts whether people will show controlled or less controlled spending behavior. Thus, the model proposed here is more directly relevant to the situation of making (or not making) an impulse purchase. In addition, whereas Shiv and Fedorikhin stress the primacy of affective over cognitively desirable choices, the regulatory resource model argues that spending on both types of products will increase when resources are depleted.

Experiment 3 was designed to directly determine if regulatory resource depletion increases impulse buying not just for affectively desirable goods but also for cognitively preferable ones. This would further serve to demonstrate that self-regulation and impulse buying involve more than just cognitive resources. Further, experiment 3 examines the influence of yet another type of resource (emotional-behavioral control) on self-regulatory resource depletion and impulse buying behavior. Finally, although experiment 2 found that resource depletion significantly influenced the amount spent on impulse purchases, the impact of resource depletion on the number of items purchased did not reach significance. Hence, in the current study, we sought to again test whether the number of items purchased was a function of resource depletion along with the total amount of money spent.

Method

Forty undergraduates at University of British Columbia (24 men, 16 women) participated individually in experiment 3 in exchange for extra course credit. The data from one participant were incomplete and were not used in the analyses. Participants were told that they would be participating in two different experiments, one concerning workplace behavior and the second concerning home shopping behaviors. They completed the trait version of the BIS (Rook and Fisher 1995) and then were given a task that manipulated the amount of self-regulatory resources expended.

Participants were told that the experimenter was interested in studying situations in which, as part of one's job, one must present material orally (such as when managers make a presentation to clients) or read from a script (as in the case of flight attendants and news anchorpersons). Participants were then given multiple pages of text taken from a boring book on the biographies of scientists. The no-control participants were told to read passages aloud in a natural manner. The behavioral-control participants were given the additional instruction that they should smile and convey happiness and enthusiasm using amplified facial expressions and multiple hand gestures while reading aloud. The read aloud task was 6 minutes long and was videotaped for all participants.

Next, participants completed the PANAS (Watson et al. 1988) to measure mood states, after which they were told that they would be taking part in a grocery shopping study. They were told that they had $10 in cash that they could either take home at the end of the experiment or use to purchase products in the study. Participants were shown eight products laid out on a table with prices underneath each product. Products were matched to include a healthy and an unhealthy version of different food items. They included a granola bar and a candy bar, a bag of pretzels and a bag of Doritos, a bagel and a donut, and a bottle of orange juice and a bottle of Coke. Matched pairs were not situated by each other; instead all eight items were arranged in a random array. The difference in prices within each product pair ranged from zero cents to $.29 (difference: $M =$ $.09), with the unhealthy products being more expensive in three of the four pairings.

Participants were reminded that they could buy as many or as few of the products as they wished—or none at all. They were given a sheet of paper on which to indicate the products that they wanted and how many of each. Participants were then left alone to make their selections. After making their selections, participants completed a questionnaire that asked about the reasons for their purchase selections. Following Shiv and Fedorikhin (1999), participants rated on a seven-point Likert scale how much their purchases were driven by their "thoughts" versus "feelings," "willpower" versus "desire," "believing that it would taste good" versus "believing I'd get fat," their "prudent self" versus "impulsive self," their "rational" versus "emotional" side, and their "head" versus "heart." Finally, they indicated the extent to which they are health conscious.

Results

Manipulation Checks. As before, we predicted and found a significant difference in ratings of difficulty as a function of self-regulatory resource depletion condition ($t(37) = 2.09$, $p < .05$). As compared to the no control group ($M = 4.16$, SD $= 2.14$), the behavioral control group reported that their task was significantly more difficult ($M = 5.55$, SD $= 2.01$). Once again, mood was equivalent as a function of condition ($ts(37) < 1$). In this study, we also assessed ratings of the enjoyment of the activity to rule out this factor as a possible confound. We found no differences as a function of behavioral control condition ($t(37) < 1$). In sum, difficulty ratings indicated a successful manipulation of self-regulatory resources, but participants were not affected in other ways that may be important for interpreting their buying behavior.

Buying Behavior. Experiment 3 tested two hypotheses that replicate and extend our findings from experiment 2. First, we predicted a main effect of self-regulatory resource depletion on buying behavior. Second, we predicted an interaction between self-regulatory resource depletion condition and trait BIS scores, such that people who have chronic tendencies toward impulsive buying, as compared to those who do not, would show a greater increase in impulsive buying after depletion. We tested these two predictions using a regression analysis in which behavioral control condition, BIS scores (centered), and their interaction were used to predict money spent in the buying situation. This analysis revealed that the predicted main effect of behavioral control condition ($t(33) = 5.52$, $p < .01$, $\beta = .61$) and the main effect of BIS scores approached significance ($t(33) = 1.87$, $p = .07$, $\beta = .24$). As predicted, a significant interaction between condition and impulsive buying tendencies was found ($t(33) = 2.38$, $p < .05$, $\beta = .30$). The beta weights indicate that being resource depleted because of the behavioral control task led to more impulsive buying and, moreover, that the buying behavior of participants who typically have strong desires to buy impulsively was particularly affected by depletion of resources (see fig. 2).

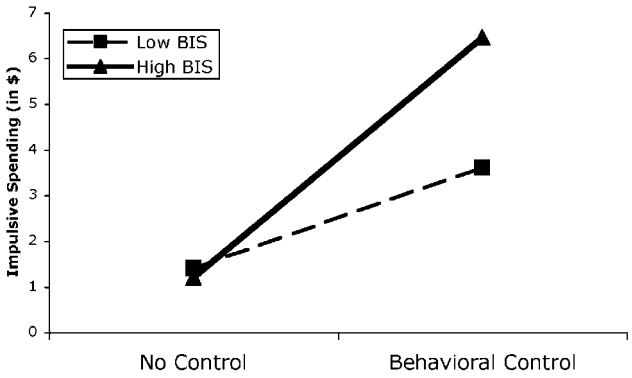
We conducted additional analyses to assess number of items purchased, and this, too, was predicted by the main effect of behavioral control condition ($t(34) = 5.10$, $p < .01$, $\beta = .60$) and its interaction with BIS scores ($t(34) = 3.30$, $p < .01$, $\beta = .40$). Notably, the predicted pattern again emerges that participants are more impulsive in their spending when they are higher in BIS scores in combination with being in the behavior control condition than in the other three conditions (high BIS scores/behavioral control: $M = 8.01$, SD $= 1.25$; low BIS scores/behavioral control: $M = 5.23$, SD $= .99$; high BIS scores/no control: $M = 3.42$, SD $= 1.32$; low BIS scores/no control: $M = 3.04$, SD $= .97$). Moreover, BIS scores on their own also predicted number of items purchased ($t(34) = 3.56$, $p < .01$, $\beta = .44$). The beta weights signal that being in the behavioral control condition predicted more items purchased, and, once again, this effect was pronounced among participants who typically experience strong tendencies to buy impulsively.

More detailed analyses assessed the role of depletion condition within high and low levels of buying impulsiveness. Within the low-BIS group (formed using a median split), there was an effect of being in the behavioral control condition on amount of money spent ($r(20) = .48$, $p < .05$), and there was an even larger (almost twice as large) effect of being in the behavioral control condition among high-BIS participants ($r(17) = .89$, $p < .001$). Number of items purchased was similarly predicted by depletion condition among low-BIS participants ($r(21) = .57$, $p < .01$), and this, too, was amplified among high-BIS participants ($r(17) = .76$, $p < .001$).

To demonstrate that self-regulatory resource depletion is

FIGURE 2

AMOUNT SPENT IN THE BUYING SITUATION AS A FUNCTION OF SELF-REGULATORY RESOURCE CONDITION AND BUYING IMPULSIVENESS SCORES, EXPERIMENT 3



NOTE.—Behavioral Control stands for random assignment to a condition in which participants are asked to exaggerate facial expressions and gestures while reading aloud a nonemotional text. No Control stands for random assignment to a condition in which participants read aloud the same nonemotional text but were allowed to do so naturally. Low BIS and High BIS are categories of participants on the basis of their buying impulsiveness scores (Rook and Fisher 1995), which was split at the median for illustrative purposes. Impulsive Spending (in $) is the mean amount of dollars spent during a buying impulsive spending situation.

not dependent on the differential weight of cognitive versus affective factors, we examined whether participants were drawn to one food type more than another. We conducted a repeated-measures multiple regression, in which the behavioral control condition, BIS scores (centered), and their interaction predicted buying healthy and unhealthy items (a within-subjects variable). There was no significant main effect of food type (healthy vs. unhealthy), nor did food type interact with BIS scores, regulatory resource condition, or the BIS × condition interaction to predict purchasing behavior (Fs$(1, 33) < 1.28$, NS). A second repeated-measures multiple regression model tested the same set of predictors on number of items purchased. This model also failed to show significant differences for the main effect of food type (healthy vs. unhealthy), the two-way interaction of food type × BIS, food type × condition, or the three-way interaction of BIS × condition × food type (all Fs$(1, 34) < 1.03$, NS; for the two-way interaction of food type × condition, $F(1, 34) = 2.27$, NS). Thus, whether an item was cognitively or affectively desirable did not seem to matter in terms of purchases as a function of self-regulatory resource depletion and impulsive buying tendencies.

To further examine this issue, we ran separate analyses on the number of items purchased and the amount of money spent on both healthy and unhealthy products. We found that depletion condition evinced a main effect on all four dependent variables, and the two-way interaction of depletion condition and BIS scores was significant for three of the four variables and marginally significant on the fourth (see table 2). The general pattern was that participants who were depleted bought more healthy items as well as more unhealthy items and spent more money on both types of items, and this was especially true among participants who are high in buying impulsiveness.

Reports Regarding Buying Decisions. After purchasing, participants were asked to indicate the extent to which they felt that their decision was based on cognitive versus affective factors. Of the seven ratings, none reached statistical significance. Two ratings indicated trends as a function of condition (heart vs. head and impulsive self vs. prudent self), but the trends for the means on these items were in opposite directions. Therefore, ratings of affective versus cognitive influences fail to explain depletion's effect on impulsive buying.

Feelings of Temptation. After the buying task, we asked participants the extent to which they felt tempted to spend all the money they were given. A regression analysis showed a main effect of depletion condition ($t(33) = 3.95$, $p < .01$, $\beta = .51$), such that resource-depleted participants felt more tempted than non-resource-depleted participants. This finding once again supports the idea that temptations are stronger and have more pull when people are lacking in self-control abilities. A main effect for BIS scores ($t(33) = 3.83$, $p < .05$, $\beta = .51$) and the BIS × condition interaction ($t(33) = 2.34$, $p < .05$, $\beta = .31$) were also significant. An examination of the means revealed that people with high BIS scores who were also in the behavioral control condition reported the strongest feelings of temptation (low BIS scores/no control condition: $M = 2.10$, SD = .70; high BIS scores/no control condition: $M = 3.89$, SD = 1.27; low BIS scores/behavioral control condition: $M = 4.71$, SD = 2.41; high BIS scores/behavioral control condition: $M = 6.75$, SD = 2.12).

TABLE 2

IMPULSIVE SPENDING AS A FUNCTION OF SELF-REGULATORY RESOURCE CONDITION AND TYPE OF PRODUCT (HEALTHY OR UNHEALTHY; AMOUNT SPENT, AND NUMBER OF ITEMS PURCHASED), EXPERIMENT 3

	No control	Behavioral control
Amount spent on healthy product ($):		
Low BIS	.98 (.80)$_a$	1.50 (1.70)$_b$
High BIS	.78 (.75)$_a$	4.23 (1.90)$_c$
Amount spent on unhealthy product ($):		
Low BIS	.54 (.49)$_a$	1.88 (.68)$_b$
High BIS	.48 (.53)$_a$	2.63 (1.65)$_c$
Number of healthy items purchased:		
Low BIS	1.36 (.80)$_a$	2.17 (1.34)$_b$
High BIS	1.67 (.87)$_a$	3.38 (1.19)$_c$
Number of unhealthy items purchased:		
Low BIS	.81 (.60)$_a$	3.00 (2.00)$_b$
High BIS	1.78 (1.09)$_c$	4.38 (2.33)$_d$

NOTE.—The data in this table are means and standard deviations (inside parentheses) relating to the effect of behavioral control (vs. no control) condition on impulsive spending, broken down as a function of healthy versus unhealthy products. Higher numbers indicate greater impulsive spending tendencies (either more money spent or more items purchased). Means in the same cluster with the different subscripts are significantly different at $p < .05$.

GENERAL DISCUSSION

The questions addressed in research on impulse buying have changed significantly throughout the decades. Early research was interested in "what" products could be best classified as impulse items and "where" (i.e., whether attributes of certain retail environments promoted impulse buying). In the 1980s, research focused on the question of "who" engages in impulse buying, a shift that led researchers to categorize people as either impulsive or nonimpulsive purchasers. Beginning in the 1990s, researchers began taking a look inside the consumer, especially in terms of whether his or her spending behavior was dictated by mood or generalized willpower. More recently, the work of Shiv and Fedorikhin (1999) brought about an examination of the role of cognitive versus affective factors in determining product choice. Of late, researchers have begun to ask the questions of "when" and "why" impulse buying occurs. The

present studies contribute to this viewpoint by centering on the situationally determined internal state of the consumer in concert with the consumer's generalized propensity to engage in impulse buying.

We posited that self-regulatory resource availability would be an important element in determining when and why people engage in impulsive spending. Self-regulatory resources are conceptualized as a generalized pool of energy that allows people to overcome incipient urges and substitute a desirable behavior for an undesired one (e.g., Vohs and Baumeister 2004). The pool of resources is global—meaning that self-regulated behaviors across a variety of situations pull from this resource—but it also finite—meaning that behaviors or responses in one domain that draw upon this resource cause all other subsequent self-control endeavors to be less successful. In the current research, we hypothesized that temporary reductions in self-regulatory capacity would lead to stronger impulsive buying tendencies. The results of three studies support this central hypothesis.

Experiment 1 showed that participants whose regulatory resources were taxed reported being willing to spend more money for items as compared to participants whose resources were left untaxed. Given that higher valuations of products are antithetical to successful mental strategies that consumers use to help restrain themselves from impulsive buying (Rook and Fisher 1995), this finding indicates that resource-depleted people are vulnerable to impulsive overspending.

In experiment 2, participants who suppressed their thoughts in an initial task later spent more money in a mock store spontaneous buying situation. Moreover, this experiment found that participants who reported a general tendency toward impulse buying were particularly affected by depletion of regulatory resources insofar as these participants spent the most money.

In experiment 3, a behavioral resource depletion manipulation was used to confirm the pattern that depleted people buy more items and spend more money than do participants whose resources are intact. Once again, the pattern emerged that the stronger a person's trait impulsive buying tendencies, the more likely that his or her spending was influenced by resource depletion. More important, experiment 3 also addressed whether affective (as opposed to cognitive) factors play a greater role in impulsive spending after resource depletion. Affective versus cognitive determinants of spending were assessed in a manner similar to Shiv and Fedorikhin's procedure (1999), using unhealthy and healthy products in a simulated grocery store setting. However, unlike the Shiv and Fedorikhim study, in which participants were forced to choose between two preselected options, our setting allowed for the possibility that participants might not want to make a purchase at all. In the context of this setting, we found no evidence for differential purchasing of affective versus cognitive products as a function of impulsive spending tendencies and a loss of self-regulatory resources. Moreover, participants' reports of the drivers of their behavior showed no differential influence of affect or cognition.

We would be remiss not to note that our methods necessarily come with limitations that may be important to consider when interpreting the results. First, it was necessary to ensure that there were no mood effects as a result of depletion, and therefore we administered the PANAS after each manipulation; however, we cannot rule out the possibility that responding to the PANAS may have affected participants' subsequent behavior. Second, we failed to find differences in spending as a function of BIS scores in the no depletion condition. Although we believe that people high in buying impulsiveness are able to regulate their spending in those settings (see discourse above), this pattern leaves open the question of what it means to be high in buying impulsiveness. Do these people experience depletion more often or more easily than others? Do they experience possession desire more acutely? Our data do not allow us to directly address these questions, but we encourage other researchers to fashion their studies so that they can. Finally, the sample size in experiment 3 deserves mention, as it was somewhat small.

TYPES OF PRODUCT PURCHASED AS A FUNCTION OF SELF-REGULATORY RESOURCE DEPLETION

Our (non)finding regarding the idea that impulsive buying after depletion of self-regulatory resources may depend on whether the product is "emotional" (i.e., unhealthy) or "cognitive" (i.e., healthy) (Shiv and Fedorikhin 1999) is supported by three convergent theoretical approaches. First, recall that the early impulse buying literature parsed product attributes so as to classify items as those that were likely versus unlikely to be impulse purchases. However, researchers ultimately concluded that impulsive spending arises not from some special product feature but rather from within the consumer (Rook and Fisher 1995). Second, an appropriate parallel can be seen in the binge eating literature, in which binge eaters do not restrict their bingeing only to well-cooked, scrumptious foods but in fact have been known to eat frozen fish sticks, jars of honey, and whole loaves of bread when bingeing (see Heatherton and Baumeister 1991). Similar analogies can be made to the unused purchases of compulsive buyers and the senseless items often taken by kleptomaniacs. Third, compelling animal, behavioral, and neuroscientific evidence indicates that the "wanting" and the "liking" systems (see, by comparison, impulsive/craving-related vs. affective/pleasurable) are in fact separate neurological systems (Berridge 2003). Although "wanting" and "liking" do often co-occur, they are conceptually distinct: "wanting" is a nonhedonic state characterized by incentive salience, especially in terms of attraction to conditioned stimuli, whereas "liking" is a state of "pleasurable utility" (Berridge 2003, 10). It is intriguing that addictions are conditions in which the liking and the wanting systems operate in opposition—whereby an addict craves a substance that does not provide pleasure—and, extrapolating to the current analysis, we interpret our findings as self-regulatory resource depletion leading to a heightened wanting response without changes in the liking response. In short, when on a disin-

hibited tear, people feel an urge to behave in a manner that will satisfy it—in almost any way possible.

WHAT SEPARATES IMPULSIVE VERSUS NONIMPULSIVE BUYERS?

When people possess underlying urges to behave inappropriately or in opposition to a goal they have set, they may attempt to control these urges. For some people, being exposed to specific environmental cues, such as buying situations, may (nonconsciously) activate the impulsive system. These people most certainly score high in the BIS, and furthermore they would likely want to restrain themselves in the presence of a buying opportunity. Therefore, when people high in buying impulsiveness have a full compliment of regulatory resources, they should be able to control their urges. In support of this line of reasoning, we observed no meaningful difference in the buying behavior of impulsive and nonimpulsive buyers when their self-regulatory resources were intact. After a loss of self-regulatory resources, however, people whose impulsive systems are activated by buying situations had particular difficulty controlling their spending behavior. A similar pattern was found by Vohs and Heatherton (2000) in studies involving eating. They found that dieters ate more ice cream than nondieters when their resources were depleted but that both groups were similar in their ice cream consumption when in full command of their self-regulatory resources.

The link between our findings and the literature on more excessive, pathological behaviors is a potentially important one. Work on generalized impulsiveness and impulse buying in consumer behavior and psychology has focused mainly on the urge to act. The literature in psychiatry, in contrast, has focused more on people's inability to control their urges. In fact, problems such as compulsive buying, kleptomania, and binge eating are labeled as Impulse Control Disorders by the American Psychiatric Association (1994). Research on self-regulation and other factors that render people unable or unwilling to control their urges may provide insight into different spending problems (e.g., impulsive vs. compulsive spending).

SITUATIONAL DETERMINANTS OF IMPULSIVE SPENDING

Prior research has indicated several situational causes of impulsive spending, including proximity and mood. Being in close physical or temporal proximity can bring about a feeling that one already possesses the good; consequently, a decision to walk away without buying can elicit feelings of loss. Given that an aversive feeling of loss is asymmetrically larger than a joyful feeling of a potential gain (Tversky and Kahneman 1981), this may explain why proximity can elevate impulse buying. Mood is another situational factor that affects impulse buying. Multiple studies have demonstrated that both positive and negative moods trigger episodes of impulse buying (Mick and Demoss 1990; Rook and Gardner 1993; Youn and Faber 2000), suggesting that impulse buying can serve as a form of mood management in response to both forms of extreme affect.

The current analysis adds another theoretical factor that can contribute to situational impulse buying: the weakening of restraints. The present research predicted and found that depletion of self-regulatory resources results in increased impulsive spending. When regulatory resources are low, people feel stronger urges to buy impulsively, are willing to spend more money for a product, buy more items, and spend more total money than when their regulatory resources are intact.

Participants also reported feeling more tempted to spend money when they were low in regulatory resources, which suggests a complex interplay between inhibitory abilities and strength of the urge. Other preliminary research from our lab has found that people who are depleted of regulatory resources report stronger impulses and urges in a variety of settings. Thus, the theoretically orthogonal dimensions of restraint and impulse strength may not be as empirically separate as once believed. This line of research remains an intriguing new area and may give a better sense of the underlying structure of regulatory resources.

Given that the limited-resource model claims that a general pool of resources underlies all varieties of self-regulatory activity, there must exist a bidirectional link between any two domains of self-control. As self-control in one domain is exercised, a person becomes more susceptible to failing to control impulses in another. This idea may help explain the comorbidity found among several psychiatric disorders (Faber et al. 1995). Future research examining nonclinical behaviors should test whether making prudent, regulated consumer choices later leads to weaker self-regulatory abilities in another unrelated domain, a prediction for which we have preliminary support (Vohs et al. 2006).

In summary, the current research demonstrated that self-regulation is a significant determinant of situational impulsive spending. Using a model that depicts self-control abilities as being governed by a global, but limited, resource that becomes depleted with use, we found that temporarily low self-regulatory resources predicted heightened impulsive spending tendencies. We hope that this article opens the door to further explorations of the interplay between the self-control system and consumer behavior.

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