Social Psychological and
Personality Science
1(2) 175-181

DOI: 10.1177/1948550609360421
http://spps.sagepub.com
SAGE

# Self-Control Depletion Leads to Increased Risk Taking

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## Abstract

Previous research has found that individuals low in trait self-control are more likely to take excessive risks than individuals high in trait self-control. The authors expand on this by examining the causal effects of state fluctuations in self-control on subsequent risk taking. Using the self-control strength model, the authors predicted that depleted individuals would take more risks than individuals who did not exert self-control initially. This was tested in two experiments, using both self-reports and performance on the Balloon Analogue Risk Task. In both experiments, greater risk taking by depleted participants was related only to the amount of self-control previously exerted. This suggests that situational decrements in self-control strength lead to greater risk taking. Additional data suggest that the effects of depletion on taking chances are above and beyond the effects of trait self-control. This may help to explain situational effects, such as why conscientious people sometimes take unnecessary risks.

## Keywords

risk taking, self-regulation, decision making, self, judgment and decision making

When facing a risky situation, such as whether or not to have unprotected sex, people sometimes choose to play it safe. Other times, however, the same person may decide that the risk is worth it. The question is what changed. How can we explain that sometimes people are inconsistent in their risk-taking behavior? The purpose of the present research is to try to investigate that question by examining situational factors that may affect individuals' engagement in risk-taking behaviors.

There is much evidence to suggest that low self-control, at least as measured at the trait level, is related to risk taking. For instance, using a measure of impulsive sensation seeking, Zuckerman and Kuhlman (2000) found a considerable overlap between risk taking in six domains and poor self-regulation. In addition, impulsivity was related to greater sexual risk taking among individuals infected with the HIV virus (Wulfert, Safren, Brown, & Wan, 1999). Other examples of greater risk taking in more impulsive individuals include dangerous driving (Vavrik, 1997), drug and alcohol use (Wills, Sandy, & Yaeger, 2002), and gambling (Martins, Tavares, da Silva Lobo, Galetti, & Gentil, 2004). Furthermore, longitudinal studies have suggested that children with impulsive temperaments took greater risks 18 years after the measurement of their personality as compared to children with less impulsive natures (Caspi et al., 1997).

The present investigation builds on previous research that used trait measures of self-control. In particular, we hope to show that individuals whose self-control has been situationally decreased are more likely to take risks than individuals whose self-control has not been situationally decreased. That is, using a state model of self-control, we hope to show a causal link between low self-control and risk-taking behavior.

Recent research has provided strong evidence to suggest that individuals' self-control capacity fluctuates. In particular, it appears that after exerting self-control, individuals perform more poorly on subsequent self-control tasks (Muraven & Baumeister, 2000). For instance, after resisting the temptation to drink alcohol, individuals had much more trouble stopping a well-learned response as compared to after resisting the temptation to drink water (Muraven & Shmueli, 2006). Research suggests that this decrease in self-control performance cannot be accounted for by differences in mood, arousal, frustration, feelings of failure, or disliking the experiment (Muraven, Tice, & Baumeister, 1998; Schmeichel, 2007; Wallace & Baumeister, 2002).

Analogous to how physical performance suffers after exerting effort, the pattern of self-control failure after exerting self-control has been explained by a model of self-control strength. After exerting self-control, self-control strength is temporary depleted. Individuals whose strength is depleted are less willing or able to exert self-control, which results in poorer self-control performance (Muraven, Shmueli, & Burkley, 2006). Research

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on this model has found that any and all tasks that require the individual to stop, override, or change a behavior by using higher order executive functions will deplete this strength and will be affected by depletion in turn (e.g., Muraven et al., 1998; Oaten & Cheng, 2005; Schmeichel, 2007).

Based on the link between trait levels of self-control and risk taking, we predict that state levels of self-control should also be related to risky behavior. The present research uses the self-control strength model to examine how self-control contributes to risk taking. In two experiments, participants were first asked to exert self-control (participants in the control condition engaged in a task that was matched in difficulty, unpleasantness, and arousal to the self-control task but did not require stopping a response). Such activity should deplete self-control strength and subsequently lead to poorer self-control performance. They then engaged in a task that allowed them to make risky choices (Experiment 1) or engage in risky behavior (Experiment 2). We predicted that depleted individuals would take greater risks than participants in the control condition. The differences in risk taking should not be related to mood or arousal but instead should be related only to the amount of self-control initially exerted.

In Experiment 2, we also measured participants' trait level of self-control. This was included to test the relative influence of state and trait self-control on subsequent risk taking and to examine whether state fluctuations in self-control strength equally affect individuals who are high or low in trait self-control.

## Experiment 1

### Method

*Participants.* A total of 70 undergraduates (30 male, 40 female) participated in return for partial course credit. Participants were individually tested by an experimenter blind to the research hypotheses.

### Materials

*Depletion task.* To deplete participants of their self-control, we used a task that has been used in previous depletion studies (Baumeister, Bratslavsky, Muraven, & Tice, 1998; Wheeler, Brinol, & Hermann, 2007). For the first part of the task, all participants were instructed to cross out all instances of the letter *e* on a page of meaningless text. This portion of the task lasted for 5 min, and it was used to establish a baseline behavioral pattern that would be subsequently overridden by some participants. In the second part of the task, those in the depletion condition were given a new page of text and were instructed to cross out all instances of *e* except for those that appeared next to another vowel or one letter away from another vowel. Following these new instructions required overriding the previously established behavioral response (crossing out all instances of *e*) and therefore required the exertion of self-control. For the second part of the task, participants in the control condition again crossed out all instances of *e* on a new page of text, which presumably required little if any self-control. For all participants, the second phase of the task lasted for 5 min.

*Risk questionnaire.* As a measure of risk, we used an adapted version of Kogan and Wallach's (1964) Choice Dilemma Questionnaire (CDQ). The CDQ describes 12 hypothetical situations in which a character is faced with the choice between two distinct courses of action. One of the alternatives is more desirable and attractive than the other, but the probability of attaining or achieving it is less certain than the more conservative alternative. Participants play the role of an advisor to the character in the vignette and are asked to select the lowest odds of success necessary for them to recommend that the character select the more attractive option. The available selections are odds of 1, 3, 5, 7, and 9 in 10, and there is also a response available if the participant thinks the character should not choose the riskier option, no matter what the odds (this response is coded 10). The responses to each vignette are averaged to form an index of risk, with lower numbers indicating the endorsement of riskier choices. The vignettes were slightly altered to sound more contemporary and to more evenly represent both genders. In our sample, the CDQ had adequate internal consistency ($\alpha = .72$).

*Mood measure.* To measure participants' mood, we used the Brief Mood Introspection Scale (BMIS; Mayer & Gaschke, 1988). The BMIS is a mood scale that assesses participants' current mood based on their responses to 16 adjectives. In particular, participants rated how they feel in relation to each of the adjectives on a 7-point Likert-type scale ranging from 1 (*definitely do not feel*) to 7 (*definitely do feel*). The scale contains two subscales: Mood Valance and Arousal ($\alpha = .86$ and .51 in the current experiment).

*Procedure.* On entering the laboratory, participants were instructed that they would be partaking in a study concerning concentration and decision making. The "e-task" was introduced as a concentration task, and participants were randomly assigned to either the depletion or the control condition. After completing the initial phase of the e-task, participants completed the second phase of the task in which participants in the depletion condition had to override a previously learned response. For all participants, the entire e-task lasted for 10 min.

Following the completion of this task, participants were given a questionnaire packet containing the mood measure, the risk questionnaire, and a brief demographic questionnaire. After completing this packet, participants were debriefed and released.

### Results

To analyze the data from the CDQ, we averaged responses to the individual dilemmas to form an index of risk. Lower numbers indicated the endorsement of riskier choices. An independent-samples *t* test conducted on CDQ scores was significant, $t(68) = 2.25$, $p < .05$, $d = .55$, indicating that those in the depletion group endorsed riskier choices than those in the control group (see Table 1 for means). In short, participants who were depleted of their self-control strength during the e-task selected riskier choices on the CDQ.

**Table 1.** Experiment 1: Responses on Key Variables

| | Control | | Depletion | | |
|---|---|---|---|---|---|
| Variable | *M* | *SD* | *M* | *SD* | *t* |
| Risk level on CDQ | 6.62 | 1.06 | 6.00 | 1.23 | 2.25* |
| Mood | 7.62 | 10.55 | 6.67 | 14.07 | 0.32 |
| Arousal | 25.02 | 6.41 | 24.19 | 6.20 | 0.64 |

Note: $N = 70$. CDQ = Choice Dilemma Questionnaire.
$^{*}p < .05$.

There was no evidence that the different instructions on the e-task led to differences in mood or arousal. No differences between the groups on these variables emerged (see Table 1 for means). In addition, neither mood nor arousal level was correlated with choices on the CDQ (*p*s > .31). Furthermore, the effect of depletion condition on CDQ responses remained significant after controlling for mood and arousal, $F(1, 66) = 4.95$, $p < .05$, $\eta^2_p = .07$.

## Discussion

Using a well-established paper-and-pencil measure of risk taking, we found that depleted individuals were willing to take larger chances than nondepleted individuals. Secondary analyses indicated that the effects were not a product of the initial self-control exercise engendering a more negative mood or greater arousal. Instead, it appears that risk taking was related to the amount of self-control exerted in the first part of the experiment.

The second experiment was designed to replicate these results using a behavioral measure. Although there is good evidence to support the validity of self-report measures of risk taking, ultimately we believe that the best measure of risk taking is actual behavior in a situation where people have something to lose (Baumeister, Vohs, & Funder, 2007). In addition, Experiment 2 included additional manipulation checks beyond mood and arousal to further clarify that the depletion of self-control strength leads to subsequent increases in risk taking. Furthermore, we measured trait levels of self-control so as to examine the relative influence of situational self-control demands (i.e., depletion) and trait self-control on subsequent risk-taking behavior.

# Experiment 2

## Method

*Participants.* A total of 46 undergraduates (24 males, 22 females) participated in return for partial course credit. Participants were individually tested in sessions that lasted approximately 30 min by an experimenter blind to the research hypotheses.

## Materials

*Depletion task.* Participants' level of depletion was manipulated using an attention control task that has been previously used to deplete people of their self-control (Schmeichel, Vohs, & Baumeister, 2003). Specifically, participants were asked to watch a 6-min videotape of a woman being interviewed by an off-camera interviewer. Participants in all conditions were told to watch the video very carefully because at the end of the experiment they would ostensibly make a series of judgments about the interviewee based on her nonverbal behavior. To fit with this cover story, the video did not include any audio. In addition to the woman being interviewed, the video continuously displayed a series of common English words (e.g., glue, tree) for 30 s each in the bottom-right quarter of the screen. The words were readily apparent to the participant but were positioned in a way that they did not directly interfere with watching the interviewee.

Participants in the control condition of the experiment were given no instructions about the words, nor were they forewarned about their appearance; they were simply told to carefully watch the woman being interviewed. Participants in the depletion condition were given clear instructions to ignore the words and to solely focus their attention on the woman being interviewed. They were told to immediately redirect their attention back to the woman being interviewed if they found themselves looking at the words. In sum, participants in the control condition were allowed to freely view the videotape without any restrictions on their attention, whereas participants in the experimental condition were required to control their attention by ignoring the words.

*Measure of risk.* Participants' level of risk taking was assessed using the Balloon Analogue Risk Task (BART; Lejuez et al., 2002). The BART is a computer simulation designed to simulate an actual risk-taking scenario. In the BART, participants are presented on a computer screen with a simulated balloon, a button labeled "Press this button to pump up the balloon," a button labeled "Press to Collect $$$," and a box labeled "Total Earned."

Participants earned $0.01 for each time they pumped the balloon, and the task contained 20 trials. Each trial began with a deflated balloon in the center of the screen. Participants could inflate the balloon by clicking on the "Press this button to pump up the balloon" button. With each pump, the balloon increased in size by approximately 0.3 centimeters in all directions. At any point in the trial, participants could click on the "Press to Collect $$$" button. Pressing this button transferred the money earned during the current trial to their permanent bank, the box labeled "Total Earned." Participants were also instructed that at any point in the trial the balloon may explode. A trial ended when either the participant pressed the "Press to Collect $$$" button or when a balloon exploded. If a balloon exploded, all money earned in that trial was lost, though earnings in the "Total Earned" box were not affected. Participants were informed prior to beginning the task that they would actually be paid the amount that they earned at the end of the experiment.

The probability that the balloon would explode on the first pump was 1/128. If the balloon did not explode on the first pump, then the probability that the balloon would explode on the second pump was 1/127, on the third pump 1/126, and so

**Table 2.** Experiment 2: Responses on Key Variables

| | Control | | Depletion | | |
|---|---|---|---|---|---|
| Variable | *M* | *SD* | *M* | *SD* | *t* |
| BART score | 27.43 | 13.02 | 34.34 | 9.72 | –2.04* |
| Balloons 1-10 | 27.52 | 13.73 | 34.04 | 9.11 | –1.90† |
| Balloons 11-20 | 27.91 | 14.64 | 34.92 | 11.74 | –1.80† |
| Explosions | 4.43 | 2.76 | 5.65 | 2.01 | –1.71† |
| Money earned | 3.97 | 1.46 | 4.79 | 0.77 | –2.38* |
| Mood | 7.82 | 11.82 | 9.52 | 12.36 | –0.48 |
| Arousal | 22.87 | 8.27 | 24.30 | 7.34 | –0.62 |
| Inhibit impulses | 3.00 | 1.78 | 4.22 | 1.70 | –2.37* |
| Self-control | 3.30 | 1.80 | 4.35 | 1.90 | –1.92† |
| Difficulty | 2.09 | 1.35 | 1.91 | 1.24 | 0.46 |
| Frustration | 3.43 | 2.02 | 3.48 | 1.70 | –0.08 |
| Effort | 4.04 | 1.97 | 4.00 | 1.54 | 0.08 |
| Trait self-control | 4.18 | 0.89 | 4.00 | 1.15 | 0.57 |

Note: $N = 46$. BART = Balloon Analogue Risk Task.
†$p < .10$.
*$p < .05$.

on, until the 128th pump, at which point the probability of the balloon exploding was 1/1. With these probabilities, the average explosion point is 64 pumps. This algorithm accurately models a real-world risk-taking situation in which taking excessive risk results in diminishing returns and increased threat (Lejuez et al., 2002). As the number of pumps increases, each subsequent pump risks more and more money and leads to less and less relative gain. Participants in the current experiment were given no information about the explosion probabilities.

*Mood measure.* As in Experiment 1, we used the BMIS to assess participants' mood and arousal levels ($\alpha = .82$ and .62).

*Trait self-control.* The brief version of the Self-Control Scale (SCS; Tangney, Baumeister, & Boone, 2004) was used to measure trait self-control. The brief version of the SCS contains 13 items that assess an individual's trait level of self-control (e.g., "I am good at resisting temptation"). The items used a 7-point Likert-type scale (1 = *not at all like me*, 7 = *very much like me*) and were averaged to form a composite trait self-control score ($\alpha = .86$).

*Procedure.* On entering the laboratory, participants were seated at a table with a computer. They signed an informed consent sheet and were told that over the course of the next 30 min they would be engaging in several unrelated tasks concerning person perception and also decision making. The experimenter then introduced the video task and left the room for 6 min while the participant watched the video.

On completion of the video, participants completed the BMIS to assess their mood and arousal. Following this, they began the BART. Instructions for the BART were presented both visually on the computer screen and verbally, and steps were taken to ensure that each participant fully understood the instructions to the task. The experimenter then left the room while the participant completed the 20 BART trials. After completing the BART, participants were given a questionnaire packet containing the SCS and a demographics questionnaire. In addition, the packet contained a few manipulation check items that assessed the amount of self-control exerted on the video task ("How much did you feel the need to inhibit impulses while watching the video?" "How much self-control did the task require?") as well as other aspects of the task (e.g., difficulty, effort, and frustration) using a 7-point Likert-type scale (1 = *very little*, 7 = *very much*).

## Results

*Manipulation check.* We examined responses to our two manipulation check items probing self-control exertion to ensure that participants differed in the extent to which they exerted self-control during the video task. Presumably, participants who were instructed to control their attention should have exerted more self-control on the task than participants in the control condition. Indeed, manipulation check responses supported this prediction. Participants in the depletion condition reported having to inhibit their impulses more than participants in the control condition, $t(44) = –2.37$, $p < .05$, $d = .70$. In addition, the difference in the amount of self-control required between the depletion condition and the control condition approached conventional levels of significance, $t(44) = -1.92$, $p = .06$, $d = .57$ (see Table 2 for means). In short, the two groups differed in the extent to which they exerted self-control during the initial task.

The two groups did not differ in other important respects. For instance, both groups reported the same mood and arousal level after watching the video, and both groups reported that the video task was equally difficult, frustrating, and effortful (all $ps > .54$). In addition, the two groups did not differ in regard to their trait self-control. The means for these variables are depicted in Table 2.

*Risk.* To analyze the BART data, we followed the procedures of researchers who have previously used the task (Bornovalova, Daughters, Hernandez, Richards, & Lejuez, 2005; Lejuez et al., 2003) and examined the adjusted number of pumps across balloons. This score represents the average number of pumps on balloons that did not explode. It is preferred to the unadjusted average (i.e., the average number of pumps across all balloon trials) because the number of pumps is constrained on balloons that have exploded (Lejuez et al., 2003).

Participants in the depletion condition were significantly more risky on the BART than were participants in the control condition, $t(44) = –2.04$, $p < .05$, $d = .60$ (see Table 2 for means). Thus, on balloons that did not pop, depleted participants pumped the balloons more than their nondepleted counterparts. This difference remained significant when controlling for participants' level of mood and arousal $F(1, 42) = 4.25$, $p = .045$, $\eta^2_p = .09$. Also, the pattern of results was similar for both the first 10 balloon trials, $t(44) = –1.90$, $p = .06$, $d = .56$, and the second 10 balloon trials, $t(44) = –1.80$, $p = .08$, $d = .53$, and a comparable pattern of results was found when other indicators of risk (i.e., number of balloons exploded or money earned) were analyzed. For instance, depleted participants exploded more balloons than control participants, $t(44) = -1.71$, $p = .095$, $d = .51$, although this difference did not reach conventional levels of significance. As a result of pumping the balloon more, depleted participants earned more money on the task than did control participants, $t(44) = -2.39$, $p = .022$, $d = .70$.

To determine the relative contributions of depletion condition and trait self-control on degree of risk taking during the BART task, we entered these two variables into a regression analysis controlling for gender. Both condition, $B = 7.75$, $SE = 3.25$, $t(42) = 2.38$, $p = .02$, and trait self-control, $B = -3.75$, $SE = 1.56$, $t(42) = -2.40$, $p = .02$, independently predicted performance on the BART. In short, individuals depleted of their self-control, and individuals low in trait self-control to begin with, were riskier on the BART. No interactions between the variables emerged. This is consistent with previous research (Muraven, Pogarsky, & Shmueli, 2006) that has found an additive effect of depletion and trait self-control.

### *Discussion*

Experiment 2 replicated the results of Experiment 1 using a task where participants could actually lose money by being risky. Once again, we found that depleted individuals took greater risks than did nondepleted individuals, even in situations where money was on the table.

It should be noted that in the current experiment, risk taking on the BART paid off in the form of earning more money. Because the average number of pumps per group (27.43 and 34.34, respectively) was below the average explosion point across balloons (64, which is also the optimal number of pumps to maximize earnings), the group that pumped the balloon more earned more money. This finding is not unique to our experiment, as participants generally respond in a risk-aversive manner on the BART (Lejuez et al., 2002; Lejuez et al., 2003). It could perhaps be argued that because depleted participants earned more money than control participants, their response pattern on the task was indicative not of risk taking but rather of an optimal strategy. However, the finding that depleted participants performed differently than control participants right from the beginning of the task (i.e., on the first 10 balloon trials) suggests that the differences found were not because of depleted participants more quickly learning the contingencies of the task. That is, depleted participants took greater risks on the BART even before they had the necessary information to identify the optimal response pattern (Lejuez et al., 2003).

The risk taking by depleted individuals was not related to negative mood, arousal, frustration, or other experimental variables. Indeed, the depleted and nondepleted groups did not differ on these variables. However, we did find that the amount of self-control exerted on the first task was related to risk taking, again suggesting that the effects are being driven by the depletion of self-control strength. In addition, the results of Experiment 2 suggest that self-control depletion has an additive effect with trait self-control on subsequent risk taking. That is, self-control depletion appears to affect individuals the same regardless of whether they are high or low in trait self-control.

## General Discussion

Across two experiments, using different measures and methods, we found that depleted individuals were more risky than nondepleted individuals. The greater risk taking cannot be explained by mood, arousal, frustration, or other experimental variables. Instead, it was only related to the amount of self-control exerted in the first part of the experiment.

The results point to the causal role of self-control in risk taking. Using an experimental approach, individuals whose self-control ability was temporarily decreased took greater risks than individuals whose self-control ability was not decreased. We believe these two experiments show that low self-control is a direct cause of risk taking. We also established that the depletion instructions did not evoke greater negative affect or arousal, and hence theoretical accounts of risk taking that rely on emotion, ego threat, or stress to explain risk taking are insufficient to account for the current data. Instead, risk taking appears to be directly related to self-control capacity.

In the present research, we found an additive (not interactive) effect between trait and state self-control, consistent with previous research (Muraven, Pogarsky, et al., 2006). It is likely that trait self-control, at least as measured in the present experiment, captures far more than just absolute levels of self-control resources. However, the results may help to explain variance in risk-taking behavior. That is, when depleted, even individuals who are usually less likely to take risks (e.g., individuals high in trait self-control) may pursue more risky courses. Thus, it is possible that situational demands on self-control may help account for variance in an individual's risk-taking behavior. The present results may also help to explain why negative affect (e.g., Leith & Baumeister, 1996) and stress (Keinan, 1987) affect decision making. Indeed, recent research has suggested that the effects of negative mood on risk taking are because of the depleting effect of self-regulation (Bruyneel, Dewitte, Franses, & Dekimpe, 2009). Dealing with these experiences may deplete self-control strength (Muraven & Baumeister, 2000), thereby leading to poorer self-control performance. Hence, the effects of negative affect and stress on risk taking may be mediated by depletion. Future researchers may want to investigate this more directly.

The current results suggest that self-control depletion influences decision making and behavior even when participants are uncertain about the eventual consequences of their actions. For instance, participants in Experiment 2 initially had very little insight into the optimal number of pumps on the balloon task; they just knew that more pumps would be riskier. Hence, even in situations where the benefits (or risks) of taking chances are not clear, depleted individuals still take greater risks. This suggests that depletion is affecting how risky situations are being processed rather than just leading individuals to seek greater rewards. Although more research is needed on the role of self-control in risk taking, these findings suggest that the effects of self-control on risk taking are not because of depleted individuals' inability to inhibit strong temptations.

One possibility is that depletion affects cognitive processing (Schmeichel, 2007), so that depleted individuals cannot properly weigh probabilities and consider all the available options properly. Hence, even when desiring to make a safe choice, people may make a risky choice because of their inability to perceive, process, and ponder all of the options. This further suggests that the greater risk taking among individuals who are stressed or in a negative mood may not be just mediated by changes in subjective utility. Indeed, in the present study, people who took greater risks were not more stressed or unhappy than those who played it safe. Similarly, because people were playing for real money in Experiment 2, it is likely that they were motivated to make the correct decision. Despite this, the depleted participants still made risky choices. This suggests that motivation alone is not enough; people must have the resources to process the information thoroughly.

As in life, risk taking in the current investigation does not necessarily lead to undesirable outcomes. Indeed, in Experiment 2, by pursuing a risky strategy on the BART task, depleted participants actually earned more money than their nondepleted counterparts. This suggests that being depleted does not always lead to more negative outcomes. Rather, depleted participants appear to take more risk; whether or not the risk taking pays off in the form of positive outcomes likely depends on the specific situation. The dilemmas presented in Experiment 1 also do not have clear, correct answers, and yet depleted participants were willing to take greater chances. Because of the hypothetical nature of the dilemmas, it is impossible to tell whether this risk taking would have paid off. The extent to which depletion affects risk taking when there are clear benefits or costs to taking chances is a question that future research may wish to explore.

The current findings also suggest interventions that may help mitigate risk taking in situations when risk taking is undesirable. For instance, some preliminary evidence suggests that self-control depends on brain processes that consume energy derived from glucose in the bloodstream (Gailliot et al., 2007). As a result, the consumption of glucose drinks has been found to counteract the deleterious effects of self-control (DeWall, Baumeister, Gailliot, & Maner, 2008; Gailliot et al., 2007). Thus, ensuring that blood glucose remains at optimal levels may be one way to reduce risk-taking behaviors. Research on self-control strength has also found that self-control ability can improve from repeated practice (Oaten & Cheng, 2006). This suggests that as a long-term intervention, repeated self-control practice may be an effective way to mitigate risk-taking behavior.

Finally, the question remains at to whether depletion really affects behavior outside the laboratory. Obviously there are significant differences between the laboratory setting and what people do in their daily life. However, the measure used in Experiment 2 is not all that different from the decisions facing someone in a casino or even buying lottery tickets in the local convenience store. Even when money was involved, depleted individuals took greater risks, which suggests that the processes being examined in these experiments should carry over to more important behaviors and more realistic settings.

In conclusion, individuals whose self-control strength was depleted by previous acts of self-control made riskier decisions than individuals whose self-control capacity was intact. This provides direct causal evidence that self-control is required to avoid risk. It also begins to explain why even the most conscientious people sometimes make ill-advised decisions—their self-control strength may be temporarily depleted.

## Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the authorship and/or publication of this article.

## Financial Disclosure/Funding

This research was supported in part by Grant DA015131 provided by the National Institute on Drug Abuse and contract W91WAW-08-C-0032 from the U.S. Army Research Institute for the Behavioral and Social Sciences. The views, opinions, and/or findings contained in this paper are solely those of the authors and should not be construed as an official U.S. Department of the Army position, policy, or decision.

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