

Self-control Depletion and the General Theory of Crime

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Abstract Criminological research on self-control focuses mainly on self-control failure. Such research has not, however, investigated the consequences of exercising self-control for the individual doing so. The present study investigates this issue within the framework of both criminological self-control theory and research on self-control depletion from social psychology, which depicts self-control as akin to a “muscle” that is “depletable” by prior use [Muraven and Baumeister (2000) *Psycholog Bull* 126:247–259]. Results are presented from a laboratory experiment in which students have the opportunity to cheat. Both “trait self-control,” as measured by the Grasmick et al. [(1993) *J Res Crime Delinq* 30:5–29] self-control inventory, and “self-control depletion” independently predicted cheating. The implications of these findings are explored for criminological perspectives on self-control and offender decision-making.

Keywords Self-control · Experiment · Deterrence · Decision-making · A general theory of crime

Introduction

Self-control theory proposes that individuals who are ineffectively parented prior to age 10 develop less self-control than their similarly aged and better parented counterparts. This makes them prone to quick and easy gratification and, given the opportunity, crime (Gottfredson and Hirschi 1990). Research has generally found that low self-control is associated with various criminal and imprudent behaviors (e.g., Evans et al. 1997; Grasmick et al. 1993; Paternoster and Brame 1998) and that this relationship appears contingent on criminal opportunity (Lagrange and Silverman 1999).

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Most criminological research on this topic has tended to focus on *self-control failure*. Yet Gottfredson and Hirschi's theory implies that self-control is frequently exercised. It considers criminal and imprudent behaviors natural human tendencies requiring self-control to avoid them. Moreover, self-control is considered a continuous (i.e., differences in degree) rather than typological (i.e., either you have it or you don't) tendency. Thus, individuals who violate rules on one occasion may nevertheless exert self-control on others. This suggests self-control is frequently exercised by some, and at least occasionally so by a potentially large portion of the population. We are interested in whether there are consequences from exercising self-control. In particular we ask: Does exercising self-control itself impair further self-control?

Two perspectives are integrated to address this question: The General Theory of Crime and psychological research on "self-control depletion," under which self-control functions as a muscle that is depletable by use (Muraven and Baumeister 2000). Results are presented from a laboratory experiment in which students have the opportunity to cheat. All participants completed the Grasmick et al. (1993) 24 item self-control scale. In addition, some respondents were randomly assigned to perform a preliminary task designed to tax their self-control. The analyses tested the independent effects of both "trait self-control" and "self-control depletion" on cheating.

Criminological (trait) Self-control

Motivation and Effort

Tittle and Botchkovar (2005) recently distinguished criminological theories that emphasize motivation from those that emphasize constraint. Criminological self-control theory clearly falls in the latter category. The theory adopts the classical premise that crime is "the natural consequence of unrestrained human tendencies to seek pleasure and avoid pain" (Gottfredson and Hirschi 1990, p. xiv). Thus individuals are comparably attracted to the immediate satisfactions provided by criminal and like behaviors.¹ Individual differences in self-control determine their degree of restraint from these behaviors, given the opportunity. Individuals with low self-control are impulsive, insensitive, physical, risk-taking, short-sighted, and nonverbal (Gottfredson and Hirschi 1990, p. 90).

The deemphasis of motivation in self-control theory is reflected in the proposition that crime requires little effort:

The vast majority of criminal acts are trivial and mundane affairs that result in little loss and less gain. These are events whose temporal and spatial distributions are highly predictable, that require little preparation, leave few lasting consequences, and often do not produce the result intended by the offender (Gottfredson and Hirschi 1990, p. 16).

Under the theory, individuals do not typically cultivate opportunities for crime. When such opportunities arise, the inherent inclination to pursue pleasure suggests committing the crime is a natural outcome that requires an affirmative step, self-control, to interrupt it. The affirmative, and potentially effortful, nature of self-control is inherent in Gottfredson and Hirschi's (1990, p. 89) assertion that criminal acts provide "easy or simple" gratification

¹ Or, at the very least, the theory appears to consider any motivational differences incidental to understanding criminal behavior.

of desires. By implication then, exercising self-control to refrain from crime is “not easy” and “not simple.”

Other Theoretical Constructs and Situational Factors

Given the opportunity, individuals with low self-control are more likely but not certain to offend. Self-control is “the *differential tendency* of people to avoid criminal acts whatever the circumstances in which they find themselves” (Gottfredson and Hirschi 1990, p. 87, emphasis supplied). Hirschi and Gottfredson (1993, p. 50) later clarified: “Our theory does not claim that self-control (or self-control and opportunity) is the *only* cause of crime.” Following this premise, research has increasingly integrated other theoretical constructs into the framework of criminological self-control theory.

Some of these studies identify interrelationships between trait self-control and other constructs. For example, Lynam et al. (2000) found that impulsivity, a component of self-control, was more strongly related to juvenile offending in poorer neighborhoods, and nonimpulsive boys were no more likely to be delinquent in poor neighborhoods than in more affluent neighborhoods (see also Pratt et al. 2004). Longshore et al. (2004) found that the relationship between low self-control and drug use was fully mediated by moral beliefs and the association with deviant peers.

Research has also demonstrated the predictive capacity of other theoretical constructs, independent of variation in trait self-control. For example, in a study of 400 homeless youths from Vancouver, Baron (2003) found that long-term homelessness, deviant peers, deviant values, and unemployment all predicted crime, while controlling for levels of trait self-control. Peter et al. (2003) found that manifestations of strain, as reflected by perceived negative relationships with teachers and parents, predicted delinquency independent of variation in self-control. Finally, Tittle et al. (2004, pp. 147–148) distinguished self-control *capability* and self-control *desire*:

Those who can control themselves may not always want to do so; instead, they may sometimes deliberately choose to commit criminal acts, while those who lack the capacity for strong self-control may nevertheless so fervently want to control themselves that they refrain from criminal acts.

In data from the Oklahoma City Survey of adults 18 and older, the authors found that both the ability and desire to exercise self-control independently affected conformity.

Thus, constructs from outside of Gottfredson and Hirschi’s theory are useful in understanding how self-control affects criminal behavior. The Tittle et al. (2004) study also has another important implication. It highlights the distinction between “trait” and “situational” self-control. Gottfredson and Hirschi (1990) view self-control as a trait. It “appears early and remains stable over much of the life course” and is “well within the meaning of a personality trait” (pp. 108–109). Tittle et al. (2004, p. 151) add a situational dimension to criminological thinking on self-control:

Once formed, self-control, as conceived by Gottfredson and Hirschi, is totally “in the person,” lacking connection with future social environments or situational contexts. Interest in exercising self-restraint, however, is conceptualized as having strong linkages with the immediate social world.

Tittle and colleagues focus on the situational dimension of self-control desire. We explore another situational dimension, based on psychological research in which self-control can be depleted with use.

Self-control Depletion

The self-control depletion perspective shares several fundamental premises with criminological self-control theory. First, both assume that humans are generally motivated to pursue immediate pleasures. Muraven and Baumeister (2000) distinguish automatic processes, which are efficient and rigid, from controlled processes, which entail effortful cognition. In their view, most behaviors are automatic processes, which involve preexisting patterns of normal, typical, and desired behaviors, such as the failure to delay gratification. This premise is consistent with the classical assumption that humans seek to pursue pleasure and avoid pain.

Second, both perspectives view the motivation to satisfy immediate desires (through transgression if need be) as universal and given. As in Gottfredson and Hirschi's theory, research on self-control depletion deemphasizes motivation and focuses on the process of "constraint" from ingrained behavior patterns. In the depletion framework, self-control is the primary mechanism for constraint; it is a controlled process that overrides automatic urges, behaviors, desires, or emotions. As a controlled process, self-control entails effort.

Third, under both perspectives, low self-control can lead to a wide range of undesirable, imprudent, and antisocial behaviors. Baumeister (2002, p. 130) states:

The benefits of self-control can scarcely be overstated. Most major personal and social problems that face the United States involve some degree of failure at self-regulation. These include addiction, alcohol abuse, drug abuse, eating disorders and binges, unwanted pregnancy, AIDS and other sexually transmitted diseases, debt and bankruptcy, lack of savings, violent and criminal behavior, underachievement in school and work, procrastination, lack of exercise, and cigarette smoking.

The interchangeability of various criminal, imprudent, and socially undesirable behaviors is clearly a central feature of criminological self-control theory. Gottfredson and Hirschi (1990, p. 21) propose that "specific crimes, regardless of their outcome, do not tend to be repeated" and for example "Robbery is not followed by robbery with any more likelihood than by some other short-term pleasure, a pleasure that may well be inconsistent with another robbery (such as rape, drug use, or assault)."

These compatibilities suggest notions of self-control depletion may hold particular promise for advancing criminological perspectives on self-control. Under the depletion perspective, self-control is governed by a limited resource that is partially consumed in the process of self-control (Muraven and Baumeister 2000). This self-control is like a strength or energy reserve and the success of a self-control attempt depends on the individual's being able to marshal enough resources to fight the temptation. Moreover, as with a runner's legs or a weightlifter's arms, this self-control strength is depleted with use. After exerting self-control, the amount of self-control strength available for subsequent attempts is diminished, at least until the person has had some time to rest. Hence, exerting self-control diminishes further self-control ability in subsequent activities.

Consistent with this model, psychological experiments using a variety of self-control depletion techniques have shown that exerting self-control impairs further self-control for a

range of subsequent tasks. Muraven et al. (1998) measured how long participants could squeeze a hand grip tightly enough to hold a wad of paper between the grips. Before performing this task, respondents watched an excerpt from a disturbing documentary about environmental disasters which contained scenes of sick and dying animals. Respondents who were instructed to suppress their emotions during the movie did not squeeze the hand grip as long as respondents who were not instructed to suppress any emotional reaction to the documentary. In a second experiment, the authors measured how long respondents persisted in attempting to solve word anagrams. Prior to the task, they were asked to write down their thoughts so the experimenters could determine how they “used words in naturally occurring sentences.” Respondents who were instructed not to think about a white bear during the preliminary task did not persist as long with the word puzzles as did respondents who received no such instruction.²

Self-control depletion has also been demonstrated for alcohol consumption. Muraven et al. (2002) randomly assigned participants to either suppress the thought of a white bear or do simple arithmetic. Participants were then offered the opportunity to drink alcohol, but were instructed that after drinking they would be taking a driving test and if they did well on the test, they could win a prize. Participants who had to suppress the thought of white bear consumed more alcohol and had a higher blood alcohol level than did participants who did arithmetic. The degree of self-control participants reported exerting in the first part of the experiment was positively and significantly related to how much alcohol they later consumed.

These studies show that tasks requiring self-control apparently diminish further self-control and, in turn, self-control depletion makes individuals less able to inhibit themselves in ensuing tasks (see also Muraven et al. 1998; Vohs and Heatherton 2000; Wallace and Baumeister 2002). There is also evidence supporting the corollary proposition that performing tasks that do not require self-control does not inhibit further self-control ability (Muraven and Slessareva 2003). The ensuing experiment tests the effects of trait self-control and self-control depletion on rule violation or cheating.

Theoretical Expectations

Several hypotheses are investigated. First, Gottfredson and Hirschi (1990) contend that avoiding antisocial and rule-breaking behavior requires self-control. Thus, performing an activity that taxes one’s self-control should make an individual more likely to cheat on a subsequent task. The significance of “cheating” for self-control theory should not be underestimated (e.g., Nagin and Pogarsky 2003). Hirschi and Gottfredson (2001, p. 82) recently observed:

We know that criminal and deviant acts have something in common because participation in any one of them predicts participation in all of the others....People who rob and steal are more likely than people who do not rob and steal to smoke and drink, use illegal drugs, break into houses, and cheat on tests.

Thus, not only should exerting self-control lead to cheating on a subsequent task but, based on the “interchangeability” premise of criminological self-control theory, this effect should have important implications for crime decision-making.

² Manipulation checks established that suppressing the thought of a white bear required far more self-control than adding numbers together, but otherwise the tasks did not differ in how long they took, how unpleasant they were, how motivated participants felt afterwards, or how arousing they were.

Second, as with self-control desire (Tittle et al. 2004), self-control depletion is hypothesized to be another source of situational fluctuation around a baseline level of trait self-control. We expect that exerting self-control should impair subsequent self-control, regardless of whether an individual's long-term average self-control (e.g., trait) is high or low. That is, depletion should make someone with high self-control more likely to cheat, although such an individual should still be less likely to cheat than someone who was similarly depleted from a lower starting level of trait self-control. Thus, trait self-control and depleted situational self-control should independently enhance the probability of rule violation.

Methods

Sample

An experiment was administered to 102 students from the Psychology subject pool at a large, diverse public university in the northeastern United States. Students taking Introduction to Psychology are required either to participate in experiments via the subject pool or complete an extra term paper. Virtually all students choose the former option. During the semester, experimenters post solicitations for participants on a bulletin board in the psychology department (the notices do not indicate the true purposes of the experiments). Based on the notices, students volunteer for one or more experiments. The present experiment was described as an investigation of cognitive skills. Among the participants, 67 were female, 34 were male, and 1 declined to identify him or herself. The sample was 79% white, 4% African-American, 9% Asian, and 8% Hispanic or Latino, which is reflective of the university population (and the surrounding metropolitan area). Ninety-nine percent of respondents were between 17 and 22 years old; the mean and median age was 19 years.

Phase One: Inhibiting a Natural Impulse

Each participant was assigned to a computer, which presented all instructions and collected data. The computer also randomly assigned participants to condition at run time. The exercise was conducted in groups of up to twelve. Participants did not interact with one another and could not see each other's responses. The experiment lasted approximately 30 min.

All participants were first instructed to retype as quickly and as accurately as possible a 150-word excerpt from an advanced statistics book that appeared on the computer screen. The computer recorded all key presses but did not display to participants what they were typing. Participants were randomly assigned to one of two conditions. In the "Type All" condition, participants received no additional instructions. Beyond the initial instructions, participants in the "No Es" condition were also instructed not to type any e's or spaces.

The No Es manipulation was designed to tax respondents' self-control. Consider research on addictive behaviors. Research has shown that exposure to a temptation (e.g., the smell of alcohol for problem drinkers) tends to evoke the urge to drink without the person intending it, without conscious awareness, and with very little effort (Tiffany 1990). That is to say, drinking cues automatically trigger drinking behavior (Bargh 1994). An alcoholic who wishes to abstain from drinking must therefore exert a conscious and willful effort to not drink when the temptation is presented (Carter and Tiffany 1999; Marlatt and Parks 1982). This effortful process of resisting an automatic temptation is what requires self-control

(Barkley 1997; Kanfer and Karoly 1972; Mischel 1996). Research has shown that resisting the temptation of drinking requires self-control and, consistent with the self-control strength model, leads to poorer self-control subsequently (Muraven and Shmueli *in press*)

We chose a task in the present experiment that, analogously, required participants to suppress a routine or automatic response. Research has found that, when typing, the intention to strike a letter is automatically triggered when that letter is viewed (Rieger 2004). In other words, typing is an automatic and well-learned activity. We used this fact to manipulate the amount of self-control required by the task. The experimental manipulation specifically required participants to avoid pressing two of the most frequent characters in written English: the space bar and the ‘e.’ The prevalence of the space bar is self-evident; one is required after every word. Moreover, ‘e’ is the letter that appears most frequently in written English.³ Thus, retyping the passage as quickly and as accurately as possible, but not pressing these two characters, should require overriding or inhibiting the automatically triggered behavior of typing. Much like a drinker must exert self-control to fight the automatically triggered intention to drink when exposed to the smell of alcohol (if he or she wishes to refrain), a typist must use self-control to not type certain letters when typing quickly. The process of exerting self-control is similar for the drinker and the typist, what differs is the task being overridden (alcohol versus the letter e or space bar).

Participants in the No Es condition in fact typed fewer Es and spaces than participants in the control condition. Moreover, in debriefing following the experiment, participants in the No Es condition confirmed that the task required inhibition. No participant reported that the control condition required any inhibition.

Following this phase of the experiment, participants completed the Brief Mood Introspection Scale (Mayer and Gaschke 1988), which measures mood valence (i.e., pleasant/unpleasant) and arousal (i.e., emotionally aroused/calm). We used these measures to address alternative interpretations of our findings.

Phase Two: Rule Violation on a Subsequent Task

Participants were then instructed to solve three logic puzzles from the Graduate Record Exam that were altered to be unsolvable (see appendix). Participants were told they had a fixed period of time to solve as many questions as possible (though they were not told precisely how long). After three minutes, the computer instructed them to stop working. Participants were then prompted to indicate on the computer how many questions they solved and to then press a button to continue. This procedure generated two alternative measures of rule violation: the amount of time participants worked after the instruction to stop and the number of problems they reported solving.⁴

³ E appears in 11.2% of words in the Concise Oxford English Dictionary, 9th edition. The second and third most frequent letters are A (8.5%) and R (7.6%). See www.askoxford.com.

⁴ Aside from satisfying their course requirement, students were not compensated for participating in the experiment. In debriefing, participants consistently indicated that they were motivated to solve the puzzles, which would be consistent with prior research on the experimental setting (e.g., Milgram 1974; Orne 1970). There also were no apparent differences in motivational strength by experimental condition. We were less concerned with *why* each respondent wished to solve the puzzles. According to Gottfredson and Hirschi (1990, p. 88), the broad range of transgressions covered by their theory “require no special capabilities, needs, or *motivation*” (emphasis supplied). Their theory implies either that individuals are equally motivated to violate rules or, at the very least, any differences in motivation are incidental for understanding behavior. Thus, our experiment appears sufficient for present purposes: Participants were motivated to complete the task and, in so doing, had the opportunity to cheat.

Prior to the logic puzzle exercise, participants were told that they would have to turn in their problems at the end of the experiment. This permitted a second experimental manipulation. In the Anonymous condition, participants were instructed to omit any identifying information from their handwritten solutions. Thus, because they were being tested in groups, the accuracy of each person's claims about the number of problems they solved was unverifiable. In the Identified condition, participants were asked to put their university identification and initials at the top of the page. In this condition, participants' claims about the number of problems they solved were verifiable; the experimenter could match the written records with what participants' reported on the computer. Participants indicated during debriefing that, as we intended, the perceived opportunity to cheat was greater in the Anonymous condition. Participants had no reason to suspect that the experimenter could detect how long each respondent worked after the allotted time.

Measuring "Trait" Self-control

Finally, participants completed a brief demographic questionnaire and the 24-item self-control scale created by Grasmick et al. (1993). This scale consists of 24 items measuring the six dimensions of "trait" self-control. Five-point Likert responses were given to each question, ranging from 1 = strongly disagree to 5 = strongly agree. Responses were z scored and summed, creating an overall measure of self-control ($\alpha = 0.79$). The self-control scale was administered after the experiment to avoid indicating the purposes of the experimental manipulation. There were no differences in trait self-control across either the opportunity or depletion conditions.⁵

Results

As stated, the experiment provided two alternative measures of rule breaking. The first was the number of unsolvable problems respondents reported they had solved. This measure was fairly evenly distributed: 31% indicated 0, 26% indicated 1, 16% indicated 2, and 27% reported they had solved all 3. The second indicator of rule violation was the length of time respondents worked on the puzzles after they were instructed to stop. This measure was also evenly distributed, with a range of 1 to 173 s, and a mean of 34 s. Each outcome is examined in turn.

The Reported Number of Puzzles Solved

Table 1 reports several Ordinary Least Squares regressions of the reported number of problems solved against the key explanatory variables. For each model, we report unstandardized coefficients with standard errors, and then standardized coefficients for the comparison of effect sizes. The first two models in Table 1 focus on the effects of trait self-control, which is coded so that higher values indicate less self-control. Separate regressions are presented for the Identified and Anonymous conditions. Because the effects of low self-control should be contingent on opportunity, we expect a positive relationship between low self-control and cheating in the Anonymous condition and no relationship in the Identified condition.

⁵ Following the experiment, no participant indicated he or she was aware of the true nature of the experiment, the self-control strength model, or A General Theory of Crime.

Table 1 OLS regressions of reported number of puzzles solved

	Opportunity					
	Identified		Anonymous		Anonymous Only	
	b	β	b	β	b	B
Low trait self-control	-0.08 (0.06)	-0.17	0.14* (0.05)	0.37	0.10*(0.05)	0.27
No E's condition					0.90** (0.32)	0.38
Age	-0.03 (0.09)	-0.05	-0.34* (0.13)	-0.37	-0.31* (0.12)	-0.34
Gender	-0.04 (0.35)	-0.01	0.29 (0.37)	0.11	0.48 (0.35)	0.18
R ²	0.03		0.24		0.38	
N	55		44		44	

Notes: Standard errors beneath each unstandardized coefficient in parentheses; * $P < 0.05$, ** $P < 0.01$

The results are as expected. Low trait self-control predicts the reported number of puzzles solved only in the anonymous condition. Moreover, the unstandardized regression coefficient for the Anonymous group is distinguishable from the counterpart coefficient for the Identified group at $P < 0.01$.⁶ In model (2), despite the limited sample-wide variation in age (99% were between 17 and 22 years old), age of respondent was nevertheless significantly and negatively related to the number of puzzles reported solved. Table 1 also reports standardized regression coefficients adjacent to each model for the comparison of effect sizes. The effects of age and trait self-control in model (2) are equivalent; the absolute value of both standardized coefficients is 0.37.

Model (3) reproduces model (2), but adds a variable indicating whether or not the respondent was instructed not to type e's or spaces during the typing task. Model (3) yields several findings. First, both trait self-control *and* assignment to the No Es condition independently predict the number of problems reported solved. Both effects are in the directions anticipated earlier. The positive coefficient for the No E's condition indicates that respondents who were instructed not to hit the space bar or type e's during the initial typing task claimed they solved more unsolvable puzzles than their counterparts who received no such instruction. The coefficient for low trait self-control remained positive. Second, the model fit statistics and standardized coefficients demonstrate the effect size of the No E's manipulation. Including the indicator variable for the No E's condition raised the R^2 more than 50% from 0.24 in model (2) to 0.38 in model (3). Moreover, the standardized coefficient for the No E's condition (0.38) was more than 33% larger in absolute magnitude than that for trait self-control (0.27), and even slightly larger in absolute magnitude than that for age (-0.34).

Extra Time Taken

Table 2 reports comparable analyses for the second outcome, extra time taken on the puzzles. Recall that cheating on this aspect of the experiment was not contingent on opportunity. Therefore, models are presented for the entire sample. These analyses yield a similar pattern of findings. As in models (1) and (2), model (4) only controls for low trait self-control, age, and gender. The positive coefficient for low trait self-control suggests that individuals with lower trait self-control (i.e., higher values on the Grasmick et al. scale) took more time attempting to solve the puzzles after they were instructed to stop. Model (5)

⁶ See Paternoster et al. (1998).

Table 2 OLS regressions of extra time taken

	b	β	b	β
Low trait self-control	2.98* (1.16)	0.26	2.91* (1.14)	0.25
No E's condition			12.81* (6.47)	0.19
Age	-1.84 (2.03)	-0.09	-1.49 (2.01)	-0.07
Gender	-3.04 (7.31)	-0.04	-1.74 (7.24)	-0.02
R ²	0.07		0.11	
n	99		99	

Notes: Standard errors beneath each unstandardized coefficient in parentheses; * $P < 0.05$, ** $P < 0.01$

adds the indicator variable for the No E's condition. As in Table 1, both trait self-control and assignment to the No Es condition independently predicted rule violation, which in this case is reflected in the time taken after being told to stop. The coefficient for the No E's condition was statistically distinguishable from zero at $P < .05$ and positive, indicating that such respondents took more extra time on the puzzles than their counterparts in the Type All condition. The standardized coefficients again demonstrate that the effects of both trait self-control and self-control depletion were comparably substantial.⁷

Alternative Interpretations Based on Mood or Arousal

These findings are consistent with our primary hypothesis that the No Es manipulation depleted participants' self-control and increased their likelihood of cheating on the logic puzzle task. An alternative interpretation of these findings involves participants' moods or arousal levels. That is, assignment to the No Es condition may simply have annoyed or frustrated participants, who were then less inclined to comply with the rules established by the experimenter. Alternatively, such frustration could thereafter have particularly motivated participants in this condition to solve the logic puzzles in order to compensate for their earlier poor performance.

Measures from the Brief Mood Introspection Scale (BMIS) described earlier were used to address these alternative explanations. Recall that this scale measured participants' mood valence and emotional arousal. The above view suggests that one or both dimensions of mood should mediate the association between random assignment to the No Es condition and cheating. This was not the case. Neither variable was statistically associated with the outcome when both were added to models (3) and (5). Moreover, in each case the coefficient for the No Es manipulation remained statistically distinguishable from zero, and the magnitude of the coefficient was virtually unchanged. Finally, there were no statistically significant differences in mood valence or arousal by experimental condition, nor was either measure correlated with the number of puzzles reported solved or extra time taken in the experiment.

Conclusion

This study investigated several aspects of self-control in an experiment administered to student volunteers from the psychology department subject pool. Consistent with

⁷ Although it was beyond the scope of this study, we address the potential interaction between trait self-control and self-control depletion in the conclusion.

Gottfredson and Hirschi's theory, low "trait" self-control was strongly associated with violating the rules of the experiment. Yet we were also interested in another dimension of self-control. Gottfredson and Hirschi (1990, p. 89) remind us: "In our view, lack of self-control does not require crime but can be counteracted by situational conditions..." Horney (2005, pp. 8, 10, 15) elaborated this theme in her Presidential Address before the American Society of Criminology: "there is a pervasive tendency to look for an underlying trait that explains crime." She advocated "integrating the study of situations and individuals" because "understanding individual behavior... requires appreciation of the day-to-day situational control of behavior that exists as an individual moves across various social contexts."

We investigated a specific situational aspect of self-control involving its functioning as a muscle that is depletable by use (Muraven and Baumeister 2000). In our experiment, instructing a randomly selected subset of participants to retype a paragraph without pressing the *e* or the space bar increased the likelihood these participants would cheat on a subsequent task. This effect held while controlling for trait self-control. Both effects were comparably large. These findings are consistent with our theoretical perspective on self-control: Individuals have a reservoir of trait self-control which affects their proneness to self-control failure; however, in a given situation this reservoir can be depleted, thus independently raising the likelihood of self-control failure. We were able to rule out alternative interpretations for our findings that assume the No Es manipulation annoyed, frustrated, or otherwise antagonized respondents, thus leading them to cheat (see also Muraven et al. 2002; Muraven et al. 1998). Moreover, in debriefing following the experiment, participants indicated substantial motivation to solve the puzzles, and no motivational differences were detected across conditions.

Our findings fit well within a growing literature integrating self-control theory with other theoretical perspectives. Both Pratt et al. (2004) and Lynam et al. (2000) reported various interrelationships between low self-control and community characteristics. Moreover, structural factors remain among the strongest predictors of crime and non-conformity (Bursik and Grasmick 1993; Sampson et al. 1997). These findings are consistent with the possibility of self-control depletion. By definition, individuals living in criminogenic environments have more crime opportunities, and thus more demands on their self-control capability than individuals in less criminogenic environments. This suggests there may be more self control depletion in neighborhoods with adverse structural conditions, and can help explain why structural factors influence offending over and above variation in trait self-control.

Or consider the recent findings of Peter et al. (2003) that indicators of "strain," such as perceived negative relationships with teachers and parents, predicted delinquency independent of variation in self-control. These findings are also compatible with the possibility of self-control depletion. As in some of the experimental evidence summarized earlier, negative affect is taxing and mood regulation requires the exertion of self-control. Thus, if strain requires some mood regulation and the consequent exertion of self-control, this could help explain the predictive capacity of strain above and beyond variation in trait self-control. Indeed, recent research suggested that individuals who experienced more self-control demands during the day (such as stress, controlling emotions, and distracting thoughts) were less able to regulate their alcohol intake at night, even after controlling for urge to drink itself (Muraven et al. 2005).

The findings also lead to interesting extensions for future work. The potential interaction between trait self-control and self-control depletion was beyond the scope of our study, which was therefore not designed with sufficient statistical power to test it.⁸ Muraven et al. (2005) recently investigated the relationship between self-control demands and alcohol intake by having social drinkers record their perceptions and behaviors in real-time on a hand held palm pilot. The study found an interaction between trait self-control and self-control depletion—for individuals with higher trait self-control, more depletion was required to produce self-control failure. Although it was not among our primary research questions, we examined the data for any suggestion of this interaction. Two groups were isolated consisting of participants in the lowest and uppermost quintiles of the distribution of trait self-control (for each group $n = 20$). Model (5), which regressed extra time taken on the puzzles against the No Es identifier, age, and gender, was estimated for each group.⁹ The coefficient for the No Es manipulation was not statistically distinguishable from zero in either group, although for the low self-control quintile, $P = 0.11$ for the null hypothesis that the coefficient ($\beta_{\text{No Es}}=29.1$) is zero. Moreover, $z = 1.84$ for a test of the null hypothesis that the coefficients are equal to one another.¹⁰ If anything, the results are nominally consistent with the possibility of an interaction between trait self-control and depleted situational self-control as reported in Muraven et al. (2005). This issue merits further empirical attention.

There are other potential extensions of this study as well. Our findings demonstrate a negative implication of self-control functioning like a muscle. Under self-control theory, someone with high self-control should rarely offend. However, even with high self-control, the individual may become crime prone during periods of self-control depletion. It might, however, be useful to explore whether self-control exhibits other characteristics of muscles, beyond depletion. For example, future research might test whether self-control capacity can be “built up” or strengthened through training, to better insulate it from depletion. This would illustrate a positive implication of viewing self-control as a muscle. Whatever one’s trait self-control capability, they may become less crime prone through self-control strengthening.

We should acknowledge several potential limitations in our study. Clearly the sort of deviant behavior in the present experiment does not land an individual in prison. It is highly unlikely that an experiment giving participants the opportunity to commit actual crimes would satisfy regulations for research with human subjects. Yet Gottfredson and Hirschi’s interchangeability premise implies that the decision processes entailed in various types of misbehavior are fundamentally similar. Thus, information about rule-violation should be useful in better understanding other types of transgressions.

Another potential limitation involves our sample, which consisted of college students and was disproportionately female (67%). On this issue, Hirschi and Gottfredson (2000, p. 62, note 3) noted: “self-control affects educational and occupational attainment, restricting the range of variation within high-attainment groups... Fortunately, nature

⁸ As reported earlier, the inclusion of an interaction variable did not significantly improve the model fit and interaction coefficients were not statistically distinguishable from zero for either outcome.

⁹ This was not done for Model (3) because, for this outcome, only 44 participants had the opportunity to cheat (recall there was a second experimental condition), thus leaving at most 9 participants in each quintile of the distribution of trait self-control.

¹⁰ These analyses used the test statistic in Paternoster et al. (1998), $z = \frac{b_1 - b_2}{\sqrt{SE_{b_1}^2 + SE_{b_2}^2}}$. For a one-tailed test, the null hypothesis is rejected ($P < 0.032$); for a two-tailed test, the difference is marginally significant ($P < 0.064$).

provides sufficient variation in self-control within select groups to allow study of its effects.” This passage implies an important distinction between two issues—whether key measures in a sample vary sufficiently to test a theory, versus whether findings from that sample are informative about the theory under scrutiny.

On the first issue, participants in our study may well have had higher self-control than in the similarly aged general population. Pursuing a college education requires moderate foresight and discipline (some would say). Moreover, the sample was 67% female, and women commit a range of transgressions linked to low self-control less frequently than men do. If anything, these factors constrain variation in self-control and transgression, making it less likely for us to have observed statistically discernible relationships in the data. Substantial effects were nonetheless found, thus underscoring the robustness of trait self-control and self-control depletion as reliable predictors of rule violation.

On the second issue, how informative the findings from this specific subgroup are about self-control, we appeal to the “generality” of criminological self-control theory. Although Gottfredson and Hirschi (1990) consider the effects of low self-control to be probabilistic (i.e., low self-control makes crime more likely but not inevitable), they also consider the trait “for all intents and purposes, *the* individual-level cause of crime” (p. 232, emphasis supplied). Thus, the effects of self-control should not differ across population subgroups; any group differences in the rate of transgression, holding opportunity constant, should be explained by group differences in levels of self-control. In theory anyway, assuming sufficient variation in key measures, our sample should be as valid as any other for testing and extending criminological self-control theory. Of course the actual generality of findings from any population subgroup, even convicted offenders, is an empirical question. We urge ongoing research about the generality of criminological self-control theory to continue (e.g., LaGrange and Silverman 1999; Tittle et al. 2003). Such research would be enriched by adopting a broad perspective on self-control that integrates individual and situational features.

To conclude, there is growing evidence that a more thorough understanding of self-control and crime decision-making requires that we extend beyond the strict confines of criminological self-control theory. One promising area of thinking involves the distinction between trait and situational self-control and the concept of self-control depletion. We suspect there are other promising approaches as well.

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Appendix

The starting line-up for the Olympic basketball “Dream Team” is chosen from the following two groups:

Group A: Johnson, Drexler, Bird, Ewing

Group B: Laettner, Robinson, Jordan, Malone, Pippen

The following requirements must be met:

Two players are chosen from Group A, and three from Group B.

Jordan starts only if Bird starts.

Drexler and Bird do not both start.

If Jordan starts, then Malone does not.

Exactly 3 of the four fast-break specialists—Johnson, Bird, Jordan, Pippen—must be chosen.

1. If Jordan starts, which of the following must also start?
 - (A) Malone or Johnson
 - (B) Drexler or Laettner
 - (C) Drexler or Johnson
 - (D) Laettner or Robinson
 - (E) Malone or Robinson

2. All of the following pairs of players can start together EXCEPT:
 - (A) Pippen and Drexler
 - (B) Jordan and Johnson
 - (C) Robinson and Johnson
 - (D) Johnson and Bird
 - (E) Pippen and Malone

3. If Malone starts, which one of the following is a complete and accurate list of the players from Group A any one of whom could also start?
 - (A) J
 - (B) J, D
 - (C) J, E, B
 - (D) J, D, B
 - (E) all of these

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