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Self-Regulation and Sexual Restraint: Dispositionally and Temporarily Poor Self-Regulatory Abilities Contribute to Failures at Restraining Sexual Behavior

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Nonsexual deficiencies in self-control may contribute to inappropriate or objectionable sexual behaviors, as shown by survey questionnaires, autobiographical narratives, and experimental manipulations. People with low overall trait self-control and/or whose self-control strength had been depleted by recent, nonsexual acts were less likely than other people to stifle inappropriate sexual thoughts and to resist the temptation to engage in sexual activities with someone other than their primary relationship partner. They also engaged in more extensive sexual activity in the laboratory with their dating partner and they reported more undercontrolled or impulsive sexual behavior generally. Furthermore, there was some evidence that the effects of diminished self-control were strongest among those with the strongest sexual desires (men and sexually unrestricted individuals) and among couples with less sexual experience.

Keywords: *ego depletion; sexual behavior; sexual restraint; self-control; self-regulation; sociosexuality*

Humans are sexual creatures by nature, yet people are not free to express or act on all of their sexual desires. All known societies and cultures seek to regulate sexual behavior and therefore put pressure on individuals to curb their impulses and desires so as to bring their behavior into line with societal requirements. Although the precise content of these demands and norms varies substantially across cultures, most everyone must exert control over his or her sexual behavior

at some point during the lifespan. Moral and religious prescriptions, social norms, laws, and other social pressures have not been universally successful at eliminating sexual misbehavior, however, and the high costs of unrestrained sexual misbehavior include divorce, disease, violence, teenage pregnancy, and crime.

Self-control (or self-regulation) is the capacity to override one's desires, thoughts, and habitual patterns of behavior. Self-control is the psychological capacity to conform to social rules even when one feels impulses to do otherwise. Sexual desires arise spontaneously and perhaps uncontrollably, and therefore, people must self-regulate so as to refrain from expressing those desires in socially inappropriate or other undesirable ways. Hence, the main hypothesis of the present investigation is that deficient self-control will lead to increases in the sorts of sexual behavior that are normally restrained.

In particular, we examined self-control deficiencies arising outside the sphere of sexual behavior. If self-control is largely a unitary faculty, then nonsexual deficiencies in self-control might well affect sexual behavior.

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In this work, we examined both trait deficiencies in global (nonsexual) self-control and the impact of prior, nonsexual acts of self-control.

Self-Control as a Trait and Limited Resource

Individuals differ in their dispositional ability to exert self-control (trait self-control) and also in their current, momentarily available resources for exerting self-control (state self-control). In terms of trait self-control, some individuals demonstrate a strong ability to self-regulate consistently from early childhood through adulthood, whereas others are consistently less successful at self-regulating (e.g., Shoda, Mischel, & Peake, 1990). High trait self-control appears to foster a broad range of desirable abilities, such as developing and maintaining interpersonal popularity and healthy relationships, coping with stress, and eating properly (Shoda et al., 1990; Tangney, Baumeister, & Boone, 2004). The broad range of benefits experienced by people high in trait self-control suggests that self-control is an all-purpose tool that allows individuals to self-regulate in myriad domains. Hence, we propose that people who are good at self-control in nonsexual ways, such as managing their money or meeting deadlines, also will be good at controlling their sexual impulses.

There are also state fluctuations in self-control. Research on self-control suggests that self-control functions like a muscle or strength (Gailliot, Schmeichel, & Baumeister, in press; for a review, see Baumeister, Schmeichel, & Vohs, in press). Engaging in a single act of self-control seems to deplete self-control strength, thereby reducing the ability to exert self-control subsequently. To illustrate, participants in one study who completed a task that required self-control (i.e., suppressing thoughts of a white bear) were less able afterward to refrain from laughing and smiling while watching a funny film, compared to participants whose initial task did not require self-control (i.e., solving math problems; Muraven, Tice, & Baumeister, 1998). Presumably, the initial self-control task depleted their self-control strength, leaving them less able to self-regulate (i.e., control their emotions). Hence, we predict that even nonsexual acts of self-control will deplete self-control strength and potentially reduce control over sexual impulses.

Self-Control and Sexual Restraint

Several patterns of research findings suggest a link between general self-control and sexual restraint. First, an inability to self-regulate is central to the definition of sexual control disorders (Wiederman, 2004). People who experience compulsive sexuality or sexual addiction suffer primarily from an inability to control their

sexual behavior. Second, certain patterns of sexual misbehavior have been linked with nonsexual behaviors indicative of low self-control, such as drug addiction, alcohol abuse, and poor dietary restraint (e.g., Koeppe, Schildbach, Schmager, & Rohner, 1993). Third, measures of trait self-control predict some behaviors indirectly related to sex, such as using birth control or condoms (e.g., Wills, Gibbons, Gerrard, Murry, & Brody, 2003). Failures to take these precautions can be seen as reflecting low self-control.

The link between self-control and sexual restraint suggests that low self-control might lead to an inability or disinclination to restrain one's sexual behavior. The present work tested explicitly the causal relationship between self-control and sexual restraint.

Hypotheses and Overview of the Current Research

In five studies, we measured and/or manipulated self-control (in nonsexual spheres) and then assessed sexual behavior. Sexual restraint is inherently difficult to measure, especially in the laboratory, and so we used multiple operationalizations of sexual restraint to provide converging evidence. Because there is probably no ideal measure of sexual restraint, we relied on this convergence to provide overarching support for the hypotheses.

We predicted that participants lower in trait self-control would be more likely to engage in inappropriate or undesirable sexual behavior than would participants higher in trait self-control, as would participants who had (rather than had not) previously depleted their self-regulatory strength. We assessed sexual activity in situations that required sexual restraint and posited that increased sexual activity was the result of failures in sexual restraint.

PILOT STUDIES

Two pilot studies suggested that low self-control could potentially cause poor sexual restraint. In one study, participants ($N = 51$, 33 women) completed a brief measure of dispositional self-control (Tangney et al., 2004) that contains 13 items (e.g., "I spend too much money," reverse-scored; "I lose my temper too easily," reverse-scored) answered on a scale from 1 (*not at all like me*) to 5 (*very much like me*). None of these items referred to sexual behavior. Approximately 7 weeks later, participants completed a new 10-item questionnaire ($\alpha = .87$) to assess sexual restraint (see Table 1).

Trait self-control was positively and significantly related to sexual restraint, $r(51) = .53$, $p < .001$. The strength of this relationship did not differ by gender ($p > .59$). People with dispositionally poor self-control

in domains seemingly unrelated to sexual restraint (e.g., money management) were the most likely to fail at restraining their sexual behavior.

In a second pilot study, participants ($N = 38$, 26 women) wrote accounts of two episodes in their lives: one episode in which they had been able to restrain their sexual behavior and another in which they had not been able to restrain their sexual behavior. The order of the essays was counterbalanced across participants. Following each essay, participants completed items (e.g., “I had been on a diet,” “I had been doing a lot of other things requiring self-control”) that assessed the extent to which the episode had been preceded by circumstances that would have depleted their self-regulatory strength, using a scale from 1 (*strongly disagree*) to 11 (*strongly agree*).

A 2 (sexual restraint essay: able vs. unable) \times 2 (gender) mixed model analysis of variance (ANOVA) indicated that participants had been exerting more self-control when they were unable ($M = 4.48$, $SD = 1.79$) than when they were able to restrain their sexual behavior ($M = 3.95$, $SD = 1.63$), $F(1, 36) = 4.06$, $p = .05$, $d = .42$.¹ The effect of gender and its interaction with sexual episode were not significant, both $ps > .47$. Hence, participants recalled the circumstances preceding times when they were unable to restrain their sexual behavior as having been more depleting than the circumstances preceding times when they were able to restrain their sexual behavior. This study suggests that depletion might undermine sexual restraint, insofar as participants were accurate in their recollections.

STUDY 1: SELF-CONTROL AND EXPRESSING SEXUAL THOUGHTS

Stifling the expression of sexual thoughts is a daily challenge for many people. In that sense, it may be one of the most common demands for sexual restraint. In many situations (e.g., the office), people are typically expected to refrain from expressing inappropriate sexual thoughts (e.g., Miracle, Miracle, & Baumeister, 2002). Study 1 tested the hypothesis that low or depleted self-control would increase the likelihood of expressing socially inappropriate sexual thoughts, defined as solving word puzzles with socially risqué words related to sex.

The manipulation of depleted self-regulatory strength consisted of participants completing either the Stroop color-word interference task or a neutral task. For the Stroop task, participants stated aloud the color ink of printed words, some of which were named a different color (e.g., red was printed in blue ink). This task required self-control because participants had to override the tendency to read the word and respond instead by

TABLE 1: Items Used to Assess Dispositional Abilities in Sexual Restraint (Pilot Study)

1. I am very good at controlling my sexual urges.
2. I often go too far sexually than I want to go. (R)
3. If I want to engage in a sexual behavior, but I know that I should not, then I do not engage in that behavior.
4. Sometimes I lose control of my sexuality. (R)
5. I have willingly engaged in sexual behaviors that I really had not intended to do. (R)
6. I often end up engaging in sexual acts earlier in a relationship than I had hoped. (R)
7. I am good at resisting my temptation to engage in sexual behaviors.
8. When I am with a guy or girl who wants to engage in some sexual behavior and I do not, I still engage in that behavior. (R)
9. I often give in to my sexual urges. (R)
10. When I set a limit on my sexual behaviors, I stick to what I had planned.

NOTE: Items that were reversed scored are denoted with an (R). Responses were made on a scale from 1 (*not at all like me*) to 5 (*very much like me*).

stating the color ink. If such acts of self-control consume a limited resource, then participants should be in a depleted condition after completing this task. For the neutral task, participants read aloud the words, which did not require overriding any incipient automatic responses and hence would not require self-control.

After completing their respective tasks, participants solved word puzzles that had both sexual and nonsexual solutions (e.g., PENIS, SPINE). A separate validation study (see below) confirmed that most participants regard saying or writing the word *penis* as relatively inappropriate in a laboratory study. To refrain from including a sexual word should require self-regulation, insofar as one must override the impulse to respond with a sexual word to respond instead with a nonsexual word. Hence, low self-control should increase the likelihood of responding with sexual words.

Method

Participants. Participants were 32 undergraduates (22 women). Participants in this and all subsequent studies were enrolled in an introductory psychology course and they received partial course credit. Participants were randomly assigned to a self-control depletion or no-depletion condition.

Procedure. Participants' trait self-control was assessed during a mass-testing session at the start of the semester using the short version of the Self-Control Scale (Tangney et al., 2004). Ten participants did not attend the mass-testing session. Their data were therefore excluded from all analyses involving trait self-control.

Participants arrived at the lab 3 to 6 weeks later, were run individually, and were told the study was investigating the structure of language. First, participants assigned to the depletion condition completed the Stroop task. For this task, they were given a list of words (i.e., *red, blue, green*) presented in random order. Each word appeared in one of three colors of ink (i.e., red, blue, green) that diverged from the meaning of the word (e.g., the word *red* appeared in blue ink). Participants in the depletion condition were asked to read through the list for 4 min and state aloud as quickly and accurately as possible the color ink of each word. Participants assigned to the no-depletion condition completed a control version of the task that required them to read aloud the meaning of the word.

Next, participants completed a manipulation check by rating the difficulty of the Stroop task and a single item that assessed self-efficacy. Participants also completed the Brief Mood Introspection Scale (BMIS), which contains 20 items indicative of current mood (e.g., happy, sad) and arousal (e.g., peppy, drowsy; Mayer & Gaschke, 1988).

Last, participants completed a 5-min filler computer task and a questionnaire that contained 14 word stems and 11 anagrams. Five of the word stems (e.g., S _ _ _ , B U _ _ _) could be solved with either a nonsexual (e.g., S E T, B U G S) or sexual (e.g., S E X, B U T T) word. Three of the anagrams (e.g., N I S E P) could be solved with either a nonsexual (e.g., S P I N E) or sexual (e.g., PENIS) word. Participants were then probed for suspicion. No participants were suspicious or aware of the true purpose of the experiment.

Results

Validation study. To make sure that social norms did in fact prohibit responding with sexual words to word puzzles, we had a separate sample of participants ($N = 18$) indicate the extent to which solving word puzzles with nonsexual (e.g., COUCH) and sexual (e.g., PENIS, BUTT, SLUTTY) words was socially inappropriate. A one-sample t -test showed that participants indicated that solving the puzzles with sexual words was fairly inappropriate ($M = 5.78$, $SD = 2.96$) and that solving the puzzles with nonsexual words was not at all inappropriate ($M = 1.00$, $SD = 0.00$), $t(17) = 6.84$, $p < .001$ (because participants uniformly rated the inappropriateness of nonsexual words as 1.0, $SD = 0$, we conducted a one-sample t -test to see whether the inappropriateness of the sexual words differed significantly from 1.0). These results support the notion that solving the puzzles with sexual words violated social norms to some degree.

Manipulation check. The manipulation check indicated that the depletion and no-depletion conditions required

different levels of self-regulatory exertion. Participants in the depletion condition rated the Stroop task as being significantly more difficult ($M = 5.00$, $SD = .85$) than participants in the no-depletion condition rated the control task ($M = 2.71$, $SD = 1.26$), $t(30) = 5.96$, $p < .001$.

Self-control depletion and sexual words. Few participants (i.e., 16% of the sample) included more than one sexual word in their responses. We therefore found it appropriate to treat as the dependent measure whether a participant included either zero ($n = 17$) or at least one ($n = 15$) sexual word in his or her responses rather than the total number of sexual words. Because both the independent and dependent variables were dichotomous, logistic regression was the appropriate analysis.

A logistic regression analysis that included depletion condition and gender confirmed the prediction that depleted participants would be more likely than nondepleted participants to respond with at least one sexual word, as indicated by a significant main effect of depletion condition, $B = 2.73$, Wald statistic = 5.52, $p < .05$. Whereas 67% ($n = 10$) of the participants in the depletion condition included one or more sexual words in their responses, only 29% ($n = 5$) of those in the no-depletion condition did so.

The main effect of gender also was significant, such that men were more likely than women to include one or more sexual words in their responses, $B = 2.72$, Wald statistic = 4.86, $p < .05$. Specifically, 7 (out of 10) men and 8 (out of 22) women included at least one sexual word. The interaction between gender and condition was not significant.

Trait self-control and sexual words. A second logistic regression analysis that included trait self-control and gender revealed a significant main effect of trait self-control, such that participants lower in self-control were more likely to include one or more sexual words than participants higher in self-control, $B = -2.66$, Wald statistic = 5.12, $p < .05$. The effect of gender was again significant and its interaction with trait self-control was not.

We also examined whether trait self-control interacted with depletion condition in predicting participants' sexual responses. A logistic regression analysis indicated that the interaction between trait self-control and depletion condition and their higher order interaction with gender was not significant, both $ps > .48$.

Mood, arousal, and self-efficacy. We also examined whether the effects of depletion and trait self-control could be attributable to (mediated by) mood or arousal (assessed by the BMIS), self-efficacy (participants' responses of how well they performed on the Stroop task), and task performance (an indirect measure of self-efficacy

derived by standardizing the number of correct and incorrect [reverse-scored] responses on the Stroop task).

Tests of mediation require that a mediator be significantly related to both the independent and dependent variables (Baron & Kenny, 1986). We conducted a series of correlational analyses and found that these criteria were not met for any of the factors of interest. In particular, neither mood valence, arousal, self-efficacy, nor task performance was related to responding with sexual words. Thus, none of these factors appeared to mediate the impact of depletion and trait self-control on sexual restraint.

Discussion

Refraining from expressing sexual thoughts is socially desirable in many contexts. Study 1 found that both individual differences in self-control and manipulated self-regulatory strength were related to inappropriate sexual expressivity. Depleted participants were more likely to respond with sexual words than were nondepleted participants, as were participants lower (vs. higher) in trait self-control. These results suggest that low self-control is a powerful factor that causes people to fail to censor their sexuality in situations in which social norms dictate that they should. Presumably, lacking self-regulatory resources undermined sexual restraint.

STUDY 2: SELF-CONTROL AND SEXUAL INFIDELITY

Among social norms that restrict sexual behavior, those against sexual infidelity are among the most salient. Engaging in sexual acts outside of a committed, romantic relationship is strongly discouraged in many cultures (e.g., Sheppard, Nelson, & Andreoli-Mathie, 1995). To provide converging evidence that low self-control causes sexual misbehavior, Study 2 examined the relationship between self-control and the perceived likelihood of engaging in sexual infidelity. The rationale was that individuals in committed romantic relationships may sometimes desire extradyadic sexual involvement, but to abide by the rules of their relationship and social norms they must inhibit those desires and resist that temptation. The main prediction was that when self-control is depleted or dispositionally low, people should be less prone to restrain such desires and therefore be more likely to engage in sexual infidelity.

Our manipulation of self-control relied on breaking a habit. To establish the habit, we first had participants practice crossing out every *e* in a printed text. Self-control depletion was then manipulated by having some participants complete another page with a more complicated

rule that exempted many instances of *e*, thus requiring them to override the by-now habitual impulse to cross out all *es*. In the no-depletion (control) condition, participants did the second page with the same rule as the first, which therefore required more responses but did not entail self-regulation to override and inhibit responses. This procedure has been used before to manipulate self-regulatory exertion (e.g., Baumeister, Bratslavsky, Muraven, & Tice, 1998; Vohs & Faber, 2004).

After completing this initial task, participants responded to a series of scenarios in which they imagined that they were in a committed romantic relationship and were presented with the opportunity to engage in a sexual act with someone other than their romantic partner. For each scenario, participants were asked to indicate the likelihood that they would engage in various sexual behaviors (e.g., kissing). Ethical and pragmatic obstacles prevented us from measuring actual infidelity in the laboratory, of course, but hypothetical willingness to stray from a committed partner is one sign of weak sexual restraint.

In addition, we assessed for differential effects of self-control based on sociosexual orientation and gender. Sociosexual orientation is defined as how close emotionally a person must feel to another person before engaging in sexual intercourse (Simpson & Gangestad, 1991). An unrestricted (vs. restricted) orientation is associated with being more comfortable engaging in casual sexual intercourse and with a stronger desire for extradyadic sex (e.g., Seal, Agostinelli, & Hannett, 1994; Simpson & Gangestad, 1991). As to gender, abundant findings indicate that men desire extradyadic sex more than do women (e.g., Allgeier & Allgeier, 1995; Baumeister, Catanese, & Vohs, 2001). If low self-control undermines sexual restraint, then the effects of low self-control might be most pronounced among men and unrestricted individuals because their stronger sexual desires should require more self-control strength to overcome.

Method

Participants. One-hundred and fifteen undergraduates (88 women) were randomly assigned to a self-control depletion or no-depletion condition.

Procedure. Trait self-control was assessed at a mass-testing session. Twenty-two participants did not complete the mass testing and were therefore excluded from all analyses involving trait self-control.

Participants completed the main phase of the experiment 3 to 5 weeks later. Participants were run in a classroom setting and were told that the study was investigating the relationship between attitudes and behavior. They were given a packet that contained all

TABLE 2: Descriptive and Correlational Statistics for Sexual Infidelity, Trait Self-Control, and Sociosexuality (Study 2)

	Trait Self-Control	Sociosexuality	Ms (SDs)
Women			
Sexual infidelity	-.25*	.60**	-.11 (0.65)
Sociosexuality	-.33*	—	.00 (0.71)
Trait self-control	—	—	3.40 (0.59)
Men			
Sexual infidelity	-.44	.53*	.34 (1.17)
Sociosexuality	-.48*	—	.16 (0.64)
Trait self-control	—	—	3.30 (0.61)
All participants			
Sexual infidelity	-.31*	.53**	.00 (0.82)
Sociosexuality	-.35**	—	.04 (0.70)
Trait self-control	—	—	3.38 (0.57)

NOTE: Significant levels vary for correlations of similar magnitudes due to different sample sizes. Sociosexuality scores presented in the table are not standardized within gender, although all analyses used scores standardized within gender.

* $p < .05$. ** $p < .01$.

materials for the study and worked through the packet at their own pace.

First, participants completed the depletion manipulation. Specifically, participants were given two copies of a page of journal text. On the first page, participants were to cross out every occurrence of the letter *e*. The page contained a high number (337) of *es* and so participants should have established a well-practiced routine of crossing out *es*. For the second page, participants assigned to the no-depletion condition were asked to follow the same rule as before. Participants in the depletion condition, in contrast, were asked to follow a different rule than before by crossing out all occurrences of the letter *e* except for *es* that were followed by a vowel or *es* that appeared in a word with a vowel appearing two letters before the *e*. Afterward, participants rated the difficulty of the task as a check on the manipulation.

The following pages of the packet contained one set of seven scenarios concerning sexual infidelity and two sets of scenarios pertaining to issues unrelated to the current investigation. (The order of the three sets of scenarios was randomized across participants.) For each scenario, participants were to imagine being involved in a committed, heterosexual romantic relationship for an extended period of time (e.g., 2 years). Each scenario provided participants with an opportunity to engage in extradyadic sexual behaviors and they were to base their responses on what they would do at the present moment. In the first three scenarios, participants indicated the likelihood of their engaging in a single sexual behavior (e.g., engaging in sexual intercourse with a coworker after work) using a scale from 1 (*not at all likely*) to 9 (*very likely*; borrowed from Quatroy, 2004).

In the next four scenarios, participants indicated their likelihood of engaging in the following behaviors: flirting, kissing, groping or caressing, oral sex, and sexual intercourse, in various situations (e.g., while vacationing at the beach, the participant is alone in the hotel room of an attractive acquaintance of the opposite sex). Responses were made using a scale from -3 (*extremely unlikely*) to 3 (*extremely likely*). These responses were combined for each scenario to create a single measure (all α s > .87). The final dependent measure was obtained by standardizing and averaging the measures for each of the seven scenarios ($\alpha = .92$).

Last, participants completed the sociosexual orientation inventory (SOI; Simpson & Gangestad, 1991). The SOI assesses sexual behavior (e.g., "With how many different partners have you had sex with in the past year?") and attitudes (e.g., "I would have to be closely attached to someone [both emotionally and psychologically] before I could feel comfortable and fully enjoy having sex with him or her"). SOI scores are standardized within each gender. Higher SOI scores indicate a less restricted sociosexual orientation.

Results

Manipulation checks. The depletion and no-depletion conditions required different levels of self-regulatory exertion. Depleted participants rated the *es* task as being significantly more difficult ($M = 5.00$, $SD = 1.40$) than did nondepleted participants ($M = 3.03$, $SD = 1.59$), $t(113) = 7.03$, $p < .001$.

Depleted ($M = -.15$, $SD = 3.07$) and nondepleted ($M = .18$, $SD = 3.90$) participants did not differ in their sociosexual orientation ($t < .50$, *ns*), which suggests that the depletion manipulation did not influence responses to the SOI. There were no differences in trait self-control as a function of depletion condition (depletion condition: $M = 3.32$, $SD = .53$; no-depletion condition: $M = 3.44$, $SD = .60$) or gender (see Table 2), all F s < 1, *ns*. Additional descriptive and correlational statistics are shown in Table 2.

Self-control depletion and sexual infidelity. We first examined whether depletion increased the perceived likelihood of engaging in sexual infidelity. A regression analysis that included depletion condition, gender, and sociosexuality (see Table 3, Regression Analysis 1) indicated a marginally significant main effect of depletion condition, such that depleted participants perceived themselves as being more likely to engage in sexual infidelity than did nondepleted participants (see Table 4 for means). This effect, however, was moderated by gender. Depletion increased the likelihood of engaging in sexual infidelity among male, $F(1, 24) = 6.05$, $p < .05$, $d = .99$,

TABLE 3: Regression Analyses Predicting Perceived Likelihood of Engaging in Sexual Infidelity (Study 2)

Variable	β	t	p
Regression 1			
Depletion condition	.13	1.81	.073
Gender	.21	2.87	.005*
Sociosexuality (SOI)	.59	7.78	.000*
Depletion \times Gender	.23	3.13	.002*
Depletion \times SOI	.14	1.84	.069
Gender \times SOI	.17	2.07	.041*
Depletion \times Gender \times SOI	-.03	-.31	.759
Regression 2 (simple effects of depletion condition)			
Low SOI	.01	.09	.930
High SOI	.25	2.23	.028*
Regression 3			
Trait self-control	-.30	-3.08	.003*
Gender	.22	2.27	.026*
Self-Control \times Gender	-.18	-1.86	.067
Regression 4 (simple effects of gender)			
Low self-control	.39	3.08	.003*
High self-control	.04	.28	.779

NOTE: All variables were standardized prior to analyses. SOI = sociosexual orientation inventory.
* $p < .05$.

TABLE 4: Perceived Likelihood of Engaging in Sexual Infidelity as a Function of Depletion Condition and Gender (Study 2)

	Women	Men	Total
Depletion	-.10 (.42) _a	.73 (1.00) _b	.12 (.72)
No depletion	-.11 (.58) _a	-.14 (0.77) _a	-.12 (.62)
Total	-.10 (.51)	.34 (.99)	

NOTE: Means have been adjusted, controlling for the other factors in the regression equation. Comparisons within columns and across rows with different subscripts are significantly different at $p < .05$. Numbers in parentheses are standard deviations.

but not female, $p > .90$, participants (see Table 4 for means).

The regression analysis also indicated a marginally significant interaction between depletion condition and sociosexual orientation. To interpret the interaction, we assessed the simple effect of condition among sexually unrestricted (high SOI) versus sexually restricted (low SOI) participants (1 SD above and below the mean on SOI; Aiken & West, 1991) while controlling for gender. Results indicated that among participants with an unrestricted sociosexual orientation, depleted participants were more likely to engage in sexual infidelity than were nondepleted participants (see Table 3, Regression Analyses 2). Among restricted participants, there was no difference in sexual infidelity between conditions (see Figure 1). Thus, depletion increased the perceived likelihood of engaging in sexual infidelity among unrestricted

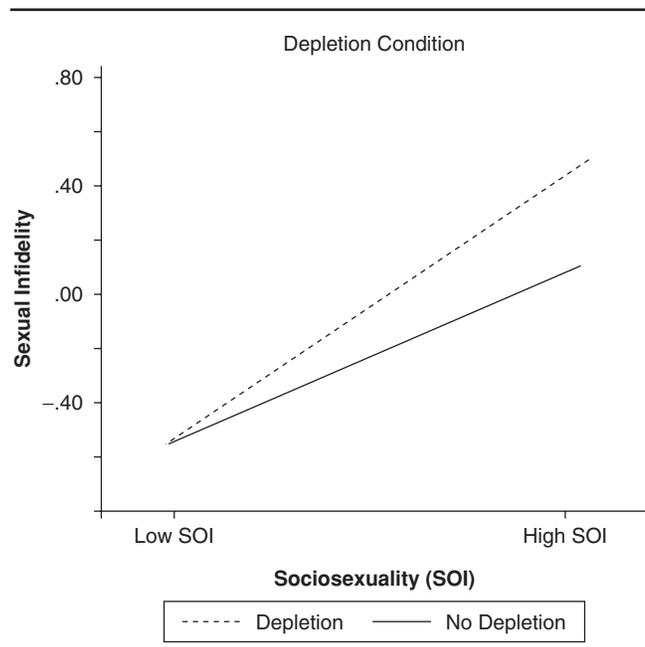


Figure 1 Participants' reported likelihood of engaging in sexual infidelity as a function of depletion condition and sociosexual orientation (Study 2).

NOTE: SOI = sociosexual orientation inventory.

(high SOI) participants but not among restricted (low SOI) participants, although we interpret this effect with some caution because the interaction between condition and sociosexuality was only marginally significant.

Trait self-control and sexual infidelity. Another regression analysis predicted sexual infidelity from trait self-control, gender, and their higher order interaction (see Table 3, Regression Analysis 3). A significant main effect of trait self-control linked low self-control with a greater likelihood of engaging in sexual infidelity.

The interaction between self-control and gender was marginally significant. The effect of gender was significant for participants lower in trait self-control but was not significant for those higher in trait self-control (see Table 3, Regression Analyses 4). Only at low levels of self-control did men indicate being more likely than women to engage in sexual infidelity (see Figure 2), although we again interpret these results with some caution given the marginally significant interaction.

In addition, a regression analysis that included trait self-control, depletion condition, and gender indicated that the interaction between trait self-control and depletion condition and their higher order interaction with gender were not significant, both $ps > .47$. Indeed, we found no sign of any interaction between trait self-control and depletion condition, even when including SOI in the model or when testing more directly the



Figure 2 Participants' reported likelihood of engaging in sexual infidelity as a function of trait self-control and participant gender (Study 2).

simple effects of depletion condition among those high and low in trait self-control. These results are consistent with the results of Study 1 and suggest that high trait self-control does not prevent depletion.

Discussion

Individuals may be tempted to engage in sexual infidelity but they often must refrain from doing so. The results of Study 2 suggest that low self-control, as caused or measured by nonsexual behaviors, causes people to fail at resisting the urge to engage in sexual infidelity. Depleted participants (i.e., those who had just completed a task that required self-regulation) rated themselves as more likely to engage in sexual infidelity than did nondepleted participants, as did participants lower (vs. higher) in trait self-control. These findings converge with the results of the previous studies by supporting the notion that self-regulatory impairments foster sexual misbehavior.

Furthermore, there was some evidence that participants with the strongest desires were the most influenced by self-control. Compared to women, male participants indicated being much more likely to engage in sexual infidelity when they possessed low trait self-control or were depleted, and the same was true for sexually unrestricted (vs. restricted) individuals when they were depleted. These results lend some support to the notion that self-regulation facilitates the ability to restrain

strong sexual impulses. Participants who probably have more frequent and intense sexual desires reported being especially unlikely to restrain themselves when they lacked self-control. Low or depleted self-control had correspondingly little effect on categories of people marked by less desire to engage in extradyadic sex.

STUDY 3: SELF-CONTROL AND SEXUAL BEHAVIOR IN THE LABORATORY

Study 3 took a step further than the previous studies by measuring actual sexual and romantic behavior in the laboratory. Specifically, Study 3 examined whether self-control depletion would cause participants to be less likely to refrain from engaging in extensive sexual behaviors with their romantic partner. People frequently restrict the extent of their sexual behavior with their dating partners (e.g., during the initial stages of a relationship or to adhere to religious and moral restrictions on premarital sex) and it seemed plausible that self-control depletion would undermine such restraint.

For the depletion manipulation, romantic couples in the depletion condition had to exert self-control by overriding a prepotent attentional response while watching a video. Couples in the no-depletion condition did not have to control their attention or thus exert self-control.

After this initial task, participants were united with their partner and invited to engage in any act of physical intimacy (e.g., holding hands, kissing) with him or her. The dependent measure was the extent of participants' sexual behavior. Although participants were invited to express physical intimacy, the extent to which they did so was left to their choice. Social regulations and other rules typically favor sexual restraint (rather than indulgence) and participants would likely need to restrict their sexual behavior to some degree (e.g., they would probably refrain from engaging in sexual intercourse).² Hence, one simple prediction was that depletion would undermine such sexual restraint and so depleted couples should engage in more extensive sexual behaviors than nondepleted couples.

There were, however, grounds for making more complex predictions about which couples would be affected by depletion. The results of the preceding studies have suggested that depletion mainly changes behavior when there is an inner conflict between sexual desire and restraint. For example, Study 2 found that the people known to desire extramarital sex expressed more willingness to engage in it when they were depleted, whereas depletion had no effect on the categories of people whose desires are weaker. Study 3 sought to carry this line of reasoning a step further by comparing groups with different levels of sexual experience with their

romantic partner (this is in contrast to sociosexuality, which concerns total prior sexual experience). Prior to engaging in extensive sexual behaviors, many couples may experience significant inner conflict insofar as they find each other sexually attractive but nonetheless restrain their sexual activity to be in accordance with norms of modesty, partner expectations, and concern that overly sexual behavior will send the wrong message (e.g., indiscriminate promiscuity, emotional neediness, or premature readiness for commitment). In contrast, after romantic partners have engaged in extensive sexual activity with one another, they are more likely to reach a comfortable level of sexual activity that is satisfactory to both and consistent with local and personal norms.

Hence, Study 3 assessed each couple's prior sexual experience. To be sure, all couples may have some sense that engaging in sex in the laboratory may violate some implicit norms for experimental participants. Within the couple, however, there would likely be more inner conflict among those who have not yet established a comfortable level of sexual intimacy and hence may be torn between desires for more sex and hesitation about going too far. Insofar as depletion weakens the restraints against sex, these couples may be most likely to let impulse prevail over restraint, as indicated by engaging in more sexual activity when depleted than when not depleted. In contrast, the couples with more sexual experience and presumably a more stabilized pattern of sexual behavior would not be coping with such inner struggles and so depletion would be less likely to release them to engage in sexual activity.

In fact, one could predict that established couples might even become less prone to engage in sexual activity when depleted. In established relationships, many people may find sex to be demanding and sometimes do it when they do not want to out of a sense of obligation (O'Sullivan & Byers, 1998). If sexually experienced couples reach that point, then they may regard the demand for sex as something that would consume energy. Insofar as depletion reduces their available stock of energy, they may become less willing to engage in sex. That is, for them, it may sometimes require self-control to make themselves engage in sex when they do not particularly feel like doing so, and depletion could conceivably reduce their capacity for this. If correct, this pattern would produce a crossover interaction between depletion and sexual experience: Depletion would make the sexually inexperienced couples more likely and the sexually experienced couples less likely to engage in extensive sexual activity.

Method

Participants. Undergraduates currently dating someone with whom they would be comfortable engaging in

some sort of physical intimacy (e.g., holding hands) were invited to participate. Participants were 21 male-female romantic couples who chose to sign up for the study. Each couple was randomly assigned to a self-control depletion or no-depletion condition.

Procedure. Participants arrived to the study with their current romantic partner. They were seated immediately in separate rooms to minimize any contact between them during the experiment. Participants were told that the study was examining the relationship between task performance and intimacy in relationships. The first task served as the manipulation of self-regulatory resources (adapted from Gilbert, Krull, & Pelham, 1988). Specifically, participants watched a 6-min video (without sound) of a woman talking. In the bottom corner of the screen, words (e.g., hair, hat, pulse) appeared individually for 10 s. Participants in the depletion condition were instructed to focus their attention only on the woman's face and to refrain from looking at the words. If they happened to look at the words, they were to refocus their attention on the woman as quickly as possible. Participants in the no-depletion condition were instructed to watch the video as they would normally (i.e., as if they were sitting at home watching television). Upon finishing their respective tasks, participants completed the BMIS to assess mood and arousal (Mayer & Gaschke, 1988).

Next, participants were instructed that they would complete a task to assess how people express physical intimacy in their relationships. Participants were asked to express some sort of physical intimacy (e.g., holding hands, hugging) with their dating partner and were told that it was entirely up to them as to what they did (provided that both partners consented to the behavior). To further minimize any external pressure to engage in greater sexual activity, participants were told that they should only engage in behaviors they felt completely comfortable with and that they could stop the task at any time. Participants were told (correctly) that they would have complete privacy and were given 3 min to complete this task.

At the end of the task, participants were again immediately taken to separate rooms and were given a questionnaire on physical intimacy to assess the extent of their sexual behavior during the previous task. Participants were reminded that their responses to the questionnaire were completely confidential and were shown a closed box into which they would place their questionnaire when finished. Participants indicated on the questionnaire whether and to what extent they had engaged in the following five behaviors on a scale from 1 (*not at all passionately/sexually*) to 9 (*very passionately/sexually*): holding hands, hugging, kissing closed and opened mouthed,

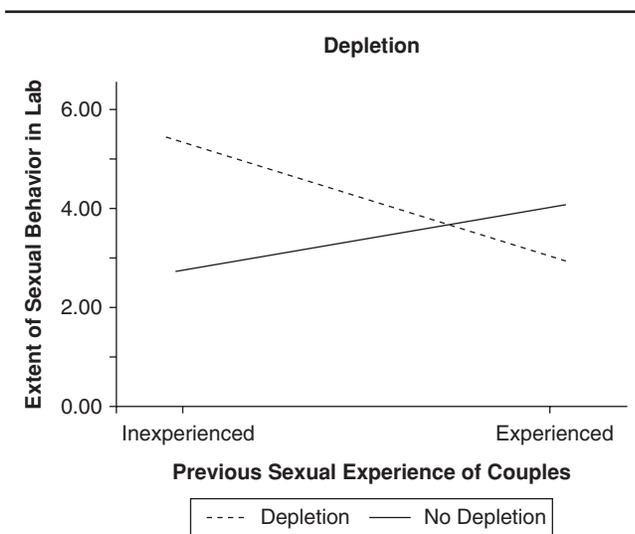


Figure 3 Extent of sexual behavior during the experiment as a function of depletion condition and couples' prior sexual experience (Study 3).

and caressing. Next, participants wrote an essay that described the behaviors in which they and their partner engaged and how intense or sexual those behaviors were and in what ways. On a following item, participants indicated the extent to which they and their partner typically engaged in sexual behaviors on a scale from 1 (*not too far, e.g., only kiss*) to 9 (*very far, e.g., sex*). The averaged responses to this item for each couple served as a measure of prior sexual experience ($\alpha = .45$), $r(21) = .79$. Last, participants were probed for suspicion. No participants indicated being suspicious or aware of the true purpose of the experiment.

Results

Self-control depletion and sexual behavior. The extent of participants' sexual behavior during the experiment was assessed by their responses on the physical intimacy questionnaire and essay. The final dependent measure of sexual behavior during the experiment was created by (a) combining each participants' responses to the five behavioral items ("no" responses were coded as 0s; $\alpha = .92$); (b) combining this score with that of each participant's dating partner ($\alpha = .88$), $r(21) = .86$; (c) having two judges (blind to condition) rate the essays on the extent to which each participant engaged in sexual behaviors and then combining these two ratings for each participant ($\alpha = .88$) and then for each couple ($\alpha = .76$), $r(21) = .79$; and (d) combining this measure with each couple's score for the behavioral items ($\alpha = .92$). The high reliability between each dating partners' responses, as well as the high reliability between responses on the

behavioral checklist and essay, seem adequate to justify confidence in the validity of our behavioral measure even though for privacy reasons we did not directly observe what the couples did.

We predicted that depleted couples would engage in more extensive sexual behaviors than would nondepleted couples and were sensitive to the possibility that this effect might be especially pronounced among sexually inexperienced couples. A regression analysis was conducted to predict sexual behavior from depletion condition, prior sexual experience, and their centered interaction with dyad as the unit of analysis. Neither the main effect of condition nor that of sexual experience was significant, $t_s < 1$. The interaction was significant, $\beta = -1.70$, $t(17) = -2.27$, $p < .05$ (see Figure 3).

Tests of the simple effects indicated that the effect of depletion condition was significant for sexually inexperienced couples (those who scored 1 *SD* below the mean), $\beta = .70$, $t(17) = 2.10$, $p = .05$, but was not significant for sexually experienced couples (those who scored .80 *SD* above the mean at the maximum of the scale), $\beta = -.35$, $t(17) = -1.20$, $p > .24$. The trend among the more experienced couples was in the opposite direction, toward less sex when depleted. Thus, depletion caused sexually inexperienced couples to engage in more sexual behaviors, whereas depletion did not have a significant effect on sexually experienced couples.

Mood and arousal. We conducted a series of analyses of the BMIS data based on Baron and Kenny's (1986) guidelines for mediation. Neither mood valence nor arousal satisfied the criteria for mediation among either men, women, or couples (i.e., the averaged scores of both partners, $r_s[21] = .27$ and $.23$, *ns*, for the correlation for valence and arousal scores, respectively, between partners). In particular, neither mood valence nor arousal was related to sexual behavior among men, women, or couples. Thus, the impact of depletion did not appear to be mediated by mood or arousal.

Discussion

Although romantic partners may wish to engage in various sexual behaviors with one another, for multiple reasons they sometimes refrain from doing so. Study 3 found that self-control depletion caused sexually inexperienced couples to be less likely to restrain their sexual behavior with their romantic partner, such that they engaged in more extensive sexual behaviors than did their nondepleted counterparts. Indeed, inspection of participants' responses on the final questionnaire indicated that these participants did engage in extensive sexual behaviors: They kissed open-mouthed for prolonged periods of time, groped and caressed each other

(e.g., on the buttocks and woman's chest), and even removed articles of clothing so as to expose themselves.

The fact that the increase in sexual activity was found primarily among sexually inexperienced couples seems consistent with the notion that self-regulatory depletion impairs sexual restraint. Sexually experienced romantic partners might not restrict their sexual behavior with one another to the same extent as sexually inexperienced romantic partners. (In support of this, in the no-depletion condition, sexually experienced couples engaged in somewhat more extensive sexual behaviors than did inexperienced couples; see Figure 3.) When their self-control was depleted, sexually inexperienced couples apparently abandoned their habitual restraints on sexual behavior.

We note that we cannot be entirely certain that depletion increased sexual activity primarily among sexually inexperienced couples because they typically exert sexual restraint in their relationship. Other explanations might be possible. For instance, these couples may have felt pressure to show their attraction to their partner and were more influenced by such pressure when they were depleted than were sexually experienced couples. To be sure, we took several steps to minimize any external pressure to engage in sexual activities (see above Method section), and so it seems at least somewhat unlikely that the effects were due to participants' conforming to experimental pressure. Despite any alternative explanations, it seems likely that there were limits as to how far sexually participants would go. Hence, the situation called for sexual restraint, and depletion seemed to undermine this restraint.

We noted the possibility that sexually experienced couples might sometimes regard sex as an obligation, so that self-control would be more required for engaging in it than for refraining from it. Consistent with that view, there was a trend toward less sexual activity among depleted than nondepleted couples in the highly experienced category, but it failed to reach significance. Perhaps a more sensitive test (e.g., one without the novelty of a laboratory situation) might find support for it. The possibility that some people may require self-control to engage in sex remains for future research.

GENERAL DISCUSSION

The current work examined whether dispositional and temporary impairments in nonsexual self-regulation would cause people to fail at restraining their sexual behavior. The results of two pilot and three studies supported this possibility. Both dispositionally low and temporarily depleted self-regulatory strength were associated with poor sexual restraint, although these main effects often were moderated by individual differ-

ences (see below). Specifically, some participants who had completed an initial task that depleted their self-regulatory strength were more likely to produce relatively inappropriate sexual words while solving word puzzles (Study 1), (hypothetically) to engage in sexual infidelity (Study 2), and (actually) to engage in relatively high levels of physical intimacy with their romantic partner (Study 3), as compared to participants who had not depleted their self-regulatory strength. Narrative accounts of failures in sexual restraint in everyday life depicted a similar pattern (Pilot Study). Participants recalled the circumstances preceding times when they were unable to restrain their sexual behavior as having been more depleting (i.e., they required more self-control) than the circumstances preceding times when they were able to restrain their sexual behavior. Thus, both experimental manipulations of self-control and self-report data converge on the hypothesis that low self-control causes failures in sexual restraint.

The relationship between trait self-control and sexual restraint provided additional evidence that low self-control is associated with failures in sexual restraint. Participants with low trait self-control (measured with purely nonsexual items) reported also having poor dispositional sexual restraint (Pilot Study). They too were more likely to express sexual thoughts (Study 1) and to (hypothetically) engage in sexual infidelity (Study 2) compared to participants with higher trait self-control. In general, the effects of low trait self-control were parallel to those of self-regulatory depletion.

Furthermore, there was some evidence that participants who belonged to categories marked by stronger, more frequent, and less discriminating sexual urges were the most likely to fail at restraining their sexual urges when self-regulation was impaired. In particular, men and sexually unrestricted individuals have the strongest desires to engage in sexual infidelity (e.g., Allgeier & Allgeier, 1995; Seal et al., 1994), and those individuals indicated being especially likely to engage in sexual infidelity when they lacked self-control (Study 2). Weaker impulses are presumably easier to restrain, and individuals with milder desires were correspondingly less affected by depletion or low trait self-control.

We did not find interactive effects of depletion and trait self-control, so apparently depletion affects people in approximately the same way across the span of individual differences in trait self-control. High trait self-control does not appear to make one immune to depletion, at least in these data. People high in trait self-control nonetheless appear more capable of self-regulating than do people with low trait self-control, even when they are depleted. This perhaps is one cause of the numerous benefits experienced by those with high trait self-control (e.g., Shoda et al., 1990; Tangney et al., 2004).

A crucial point is that our trait measure and manipulations of self-regulation consisted of wholly nonsexual behaviors and attitudes. If any sort of self-regulatory activities can weaken sexual restraints, then sexual misbehaviors may be expected among a wide range of people, such as rulers and executives, dieters, recovering addicts, combat soldiers, and others whose self-control capacity is depleted by everyday or extraordinary demands. Such sexual misbehavior may be especially common among people who have high levels of sexual desire that they normally restrain. Our intent is not to justify or excuse problematic or immoral behavior but to recognize risk factors and understand some of the internal processes by which well-intentioned individuals may uncharacteristically succumb to temptation.

Altogether, these results provide converging multi-method evidence that low self-control causes people to fail at restraining their sexual behavior. Presumably, sexual desires and impulses are often held in check, and so these may be enacted when people possess either low or depleted self-control. People who exhibit a general disposition of poor self-control (e.g., poor money management) seem highly prone to fail at restraining themselves sexually during times when they want to or should. Previous self-regulatory demands that cause people to use up their self-regulatory resources also seem conducive to failures at sexual restraint.

These findings further suggest that the effects of self-control depletion are not due to mere fatigue. Depletion caused participants to engage in more sexual activity. If depletion effects were due to fatigue, then depletion should have reduced sexual activity. (There was one hint of this pattern insofar as the sexually experienced couples in Study 3 showed a nonsignificant trend toward less sexual activity when depleted than when not depleted. Future work may explore whether depletion makes some people less prone to engage in sex.)

Limitations and Alternative Explanations

We did not examine all forms of sexual behavior, including behavior in situations that require increased sexual activity (e.g., when a gay person tries to feign sexual interest in heterosexual intercourse). Impaired self-control might undermine sexual control in these contexts as well and, hence, decrease sexual activity. We would predict that self-regulation would be useful primarily when there is a conflict between what the individual wants to do sexually and what the individual should or ought to do. Self-control should allow people to behave as they believe they should, even if that is not what they want to do.

The present results do not prove that low or depleted self-control rendered people unable to restrain their

sexual behavior, and mere unwillingness seems more likely. It seems plausible that participants in Study 2 could have said no to hypothetical temptations to engage in sexual infidelity if they had a compelling reason (e.g., if their romantic partners or prospective in-laws were watching). Laboratory manipulations of self-control depletion more likely resemble mild fatigue rather than total exhaustion of the capacity for self-regulation. Just as a physically tired person might not carry out the trash or shovel the walk, even though he could if it were necessary, the depleted self-regulator may begin to relax inner restraints long before she becomes truly unable to control herself.

A related possibility is that depletion or low self-control undermines sexual restraint by reducing the likelihood that individuals will think about the consequences of their actions. This interpretation is consistent with findings indicating that depletion reduces intelligent thought when such thought requires effort (Schmeichel, Vohs, & Baumeister, 2003). Negative consequences of poor sexual restraint therefore might be less apparent in a depleted state and the individual might be more willing to engage in inappropriate sexual behaviors.

One also might wonder whether depletion made participants less sexually restrained because they felt that their obligation to the experiment had been fulfilled after they had completed the initial self-control task or because they sought to reward themselves for completing the initial task. These explanations cannot easily account for the findings that (a) trait self-control and self-report measures from participants' day-to-day lives produced a similar pattern of results as self-control depletion, (b) depletion was in some cases moderated by individual differences (e.g., gender) related to sexual behavior, (c) factors that might be related to perceptions of fulfilling an experimental obligation or wanting a reward (e.g., task performance, self-efficacy, mood, and arousal) did not seem to account for any of the observed effects, and (d) informal conversations with participants indicated that many of them found the self-regulatory tasks (e.g., the Stroop-task) to be somewhat enjoyable. Furthermore, in Study 2, more responses were required in the control than in the depletion condition, and so if participants were rewarding themselves for their work, the opposite finding might have been expected. In addition, it is not very plausible that participants felt that they deserved a reward for completing a brief (4-min) self-regulatory task and thought that indulging themselves sexually qualified as a suitable reward. For example, it seems implausible that saying yes to hypothetical sex is much of a reward. Rather, the most parsimonious and logical conclusion seems to be that poor self-control causes failures at sexual restraint.

Implications for Special Populations

Compulsive sexuality or sexual addiction is marked by unsuccessful attempts to regulate sexual behaviors, and therefore, self-control may be especially important in restraining sexual behavior among people with sexual control disorders (see Wiederman, 2004). Lapses in sexual restraint among such individuals may occur primarily when they have been exerting self-control in other domains of their lives (i.e., when they are depleted). Similarly, sexual offenders also may be more likely to commit illegal sexual acts when they lack self-control, insofar as they ordinarily attempt to refrain from committing such acts. Although our laboratory measures prevented us from assessing more extreme and costly forms of sexual misbehavior (cf. the pilot studies), it seems reasonable to conclude that life circumstances that make extra demands on self-control are risk factors for increasing sexually inappropriate, pathological, or criminal behavior.

Concluding Remarks

Self-regulation fosters the ability to follow social norms and other rules. What an individual wants to do can oftentimes differ from what social regulations prescribe that the individual should do. The individual thus must then control his or her behavior to abide by such regulations. The evolved purpose of self-control may well be to enable people to override their socially undesirable impulses so as to abide by social regulations and live together in peace and harmony in societies that have morals, laws, and other rules.

Perhaps one of the most perennial discrepancies between people's natural desires and the social demands that restrict those desires lies within human sexuality. People are not free to express or act on every sexual impulse that may arise, even though modern Western society is becoming progressively less sexually restrictive. The current research indicates that through the ability to self-regulate, people can hope to restrain their sexual desires so as to live up to personal and societal ideals. As a result, individuals can avoid engaging in sexual behaviors that may be harmful to themselves or others and instead aspire toward maintaining a healthy and manageable sexual lifestyle. When self-regulation is weak or ineffective, however, people are less likely to live up to social standards and personal ideals. Low or depleted self-control appears to be one recipe for increasing a broad range of sexual behavior, including socially undesirable and inappropriate behavior. Our results suggest that this is true even when the causes of low self-control have nothing to do with sex. In this way, people's sexual behavior and misbehavior may be

linked to many other and seemingly nonsexual aspects of their lives.

NOTES

1. The results of the ANCOVA remained relatively unchanged when also controlling for trait self-control scores.

2. In the validation study reported in Study 1, participants also indicated the extent to which it would be socially inappropriate to "make out" with one's boyfriend/girlfriend during a psychology experiment when asked to express physical intimacy with a romantic partner. Participants indicated that engaging in sexual behaviors in the laboratory was moderately inappropriate ($M = 5.89$, $SD = 2.25$). This supports the rationale that participants would have had to restrain themselves sexually.

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