Sex Differences in Succumbing to Sexual Temptations: A Function of Impulse or Control?

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Abstract

Men succumb to sexual temptations (e.g., infidelity, mate poaching) more than women. Explanations for this effect vary; some researchers propose that men and women differ in sexual impulse strength, whereas others posit a difference in sexual self-control. These studies are the first to test such underlying mechanisms. In Study 1, participants reported on their impulses and intentional control exertion when they encountered a real-life tempting but forbidden potential partner. Study 2 required participants to perform a reaction-time task in which they accepted/rejected potential partners, and we used process dissociation to separate the effects of impulse and control. In both studies, men succumbed to the sexual temptations more than women, and this sex difference emerged because men experienced stronger impulses, not because they exerted less intentional control. Implications for the integration of evolutionary and self-regulatory perspectives on sex differences are discussed.

Keywords

self-control, sex differences, sexuality, attraction

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Sex can be hazardous. Often, desirable sex partners are unequivocally "off limits," and people who pursue such partners despite warnings and appeals may pay a steep price. For example, cheating on a current partner can be distressing for all involved parties, and the consequences for one's children, finances, and physical health may be substantial if the infidelity causes dissolution of a marriage (Amato, 2000). Furthermore, infidelity is not the only sexual hazard: Even single individuals can find themselves tempted by an appealing but otherwise incompatible partner whose seductive advances must be resisted for the sake of future well-being. In short, yielding to temptations in the sexual domain may prove costly.

Men succumb to sexual temptations more than women. For example, large-scale surveys find that men report more extradyadic sex than women (Kinsey, Pomeroy, & Martin, 1948; Laumann, Gagnon, Michael, & Michaels, 1994; Thompson, 1983), and a recent meta-analysis documented a small-to-medium effect of participant sex on infidelity incidence and frequency (d = .33; Petersen & Hyde, 2010). Similarly, other researchers have found in cross-national samples that men attempt to engage in short-term and long-term mate-poaching (i.e., stealing someone else's partner) more than women (Schmitt et al., 2004); these counternormative behaviors could reflect a yielding to inappropriate sexual temptations.

Several theoretical perspectives are consistent with this sex difference. Parental investment theory (Trivers, 1972) and sexual strategies theory (Buss & Schmitt, 1993) predict that men are more interested in opportunistic sexual liaisons than women. As women typically commit more resources than men (e.g., pregnancy, lactation, and childcare) to offspring, the cost of engaging in indiscriminate sexual relationships is especially high for women. In contrast, men could benefit from such a strategy if it produced offspring who survived to reproduce themselves. Thus, brief, low-investment sexual encounters could have resulted in greater reproductive success for men than for women in humans' evolutionary past. Another potential explanation for this difference is that the contemporary social repercussions of succumbing to a sexual temptation are more severe for women than for men. For example, people rate women as more responsible for infidelity than men (Mongeau, Hale, & Alles, 1994), and women are also socialized to perceive more sexual risk than

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men (Burt & Estep, 1981; Conley, 2011; Gustafson, 1998). Indeed, all of these factors could combine to produce a sex difference in the likelihood of falling prey to sexual temptations.

Self-Regulation Perspectives on Impulse and Intentional Control

Despite the fact that the evolutionary and socialization theoretical perspectives can account for this sex difference, neither has generated a mechanistic, process-oriented account of how the sex difference emerges. We propose that contemporary self-regulation theories can generate such an account. The problem of resisting sexual temptations shares many similarities with other forms of self-regulatory failure, including overeating, drug use, and chronic gambling (Baumeister, Heatherton, & Tice, 1994). In general, the self-regulation perspective conceptualizes the process of resisting temptations as the struggle to override an initial impulse in favor of a controlled and intentional response (Baumeister & Heatherton, 1996; Finkel et al., 2012; Hofmann, Friese, & Strack, 2009). In fact, the postulate that impulse and control are separate psychological processes that make independent contributions to behavior rests at the foundation of many successful dual-process theories (Gawronski & Creighton, 2013; Strack & Deutsch, 2004).

Within the self-regulation perspective, an impulse is defined as a primitive hedonic reaction that prompts an inclination to perform a specific behavior (Hofmann, Friese, & Strack, 2009). At the processing level, impulses emerge when a stimulus in the environment activates associations in long-term memory—associations which include affective reactions as well as behavioral tendencies (Chen & Bargh, 1999). People are frequently aware of their impulses, but they may emerge automatically because the impulsive system operates efficiently and without the need for attentional resources. This system is distinct from a second reflective or controlled system, which is characterized by intentional, goal driven processes that draw from an internal resource. The reflective system uses symbolic representations and operations, and it can serve the function of inhibiting impulsive behaviors and substituting new behaviors that are consistent with long-term goals.

Both the impulsive and reflective systems contribute independently to behavioral outcomes (Hofmann, Friese, & Strack, 2009). That is, self-regulatory task performance is determined by a combination of impulses (i.e., the output of the impulsive system) and attempts to exert control (i.e., the output of the reflective system, henceforth called *intentional control*). Therefore, someone experiencing relatively weak impulse strength could perform just as well on a self-regulatory task as someone exerting relatively strong intentional control. Yet no study on sex differences in the sexual/romantic domain to our knowledge has measured (explicitly or implicitly) both impulsive and reflective processes simultaneously. This report marks an initial attempt to illuminate sexual decision-making processes by drawing from such dual-process theories. Specifically, we propose that the sex difference in the tendency to succumb to a sexual temptation (i.e., failure on a self-regulatory task) emerges because men experience stronger sexual impulses than women, not because they exert weaker intentional control over those impulses.

Which Self-Regulatory Mechanism Could Explain the Sex Difference?

In principle, a strong sexual impulse and/or weak intentional control of that impulse could cause someone to yield to a sexual temptation. Although no study has adequately measured both processes, the prior literature contains some suggestive findings. A large body of work suggests that men have stronger sexual impulses than women. One extensive literature review demonstrated that diverse measures of sex drive strength reliably differ between men and women (Baumeister, Catanese, & Vohs, 2001; Petersen & Hyde, 2010). For example, men score higher than women on explicit, self-report scales designed to assess sexual impulses specifically (e.g., "When an attractive person flirts with me, I easily become sexually aroused"; Carpenter, Janssen, Graham, Vorst, & Wicherts, 2008). Other studies have included indirect, implicit measures of sexual impulses and found sex differences: Men are more likely than women to experience spontaneous sexual urges (Jones & Barlow, 1990), dream about sex (Kinsey, Pomeroy, Martin, & Gebhard, 1953), and recall the sexual details of stories (McCall, Rellini, Seal, & Meston, 2007). Across all types of measures, the Baumeister et al. (2001) review revealed no study in which women reported a higher sex drive than men.

Although reflective processes could affect some of these indicators in principle, several sex drive measures show sex differences in contexts that should be irrelevant to intentional control. For example, one meta-analysis found a medium-to-large sex difference in frequency of masturbation but no sex difference in attitudes toward masturbation (Petersen & Hyde, 2010); these two findings tentatively suggest that women masturbate less than men because they experience a weaker impulse to masturbate, not because their negative attitudes prompt them to inhibit masturbation. Men are also more likely than women to both initiate and desire sex in their marriages, a context with few (if any) proscriptions against sex (Baumeister et al., 2001). Thus, we hypothesized that sex differences in sexual impulse strength would at least partially explain the sex difference in succumbing to sexual temptations.

Alternatively, some have argued that the sexes differ in the ability to control their impulses. Bjorklund and Kipp (1996) contended that, relative to men, women experienced greater evolutionary pressures to inhibit their emotions and drives, and thus, women have an enhanced abilty to exert intentional control. They suggested that because ancestral

women bore more reproductive costs than men (Trivers, 1972), women would have evolved a stronger ability to inhibit their desire for sexual partners. This cautious strategy would ultimately afford women more time to evaluate potential partners and select partners who would provide them with healthy offspring and resources. Bjorklund and Kipp (1996) also provided a second (nonsexual) rationale for the hypothesis that women evolved stronger intentional control ability than men: As the primary caregiver of dependent offspring, women would have benefitted from a stronger ability to delay gratification in favor of serving the needs of a demanding infant (Bjorklund & Shackelford, 1999).

To support this hypothesis, Bjorklund and Kipp (1996) described several social-emotional inhibition studies in which men tended to perform worse than women. In these paradigms, participants must conceal facial expressions, control emotional responses, and avoid thoughts of alternative romantic partners—all paradigms which plausibly require the exertion of intentional control to perform the appropriate behavior. They also reported that women outperform men on behavioral inhibition tasks where participants must resist temptations to delay gratification. Thus, Bjorklund and Kipp (1996) concluded that, as a consequence of sex-differentiated evolutionary pressures, women possess greater intentional control ability than men on average.

However, we note both empirical and theoretical objections to the assertion that the sexes differ in their intentional control ability. As for empirical objections, contrary to Bjorklund and Kipp's (1996) suggestion that women are better than men at delay of gratification tasks, Silverman (2003) identified several problems with Bjorklund and Kipp's analysis, including their lack of a statistical test and omission of several eligible studies. In response, Silverman (2003) conducted a meta-analysis on the ability to delay gratification and documented an extremely small, "close-to-zero" (Hyde, 1996) effect of sex ($r = .056$). In addition, if women possessed better intentional control ability than men, then they should exhibit better performance than men on self-regulatory tasks, unless the resources used by the reflective system had been depleted. That is, there should be a sex difference in the extent to which depletion manipulations affect task performance, yet studies using the "two-task" depletion paradigm consistently fail to find such a sex difference (e.g., Baumeister, Bratslavsky, Muraven, & Tice, 1998; Muraven, Tice, & Baumeister, 1998). In addition, the popular Tangney, Baumeister, and Boone (2004) self-report self-control measure tends not to reveal sex differences either (e.g., Jonason & Tost, 2010). Overall, the assertion that women are better able to exert intentional control than men does not receive strong empirical support using either direct (e.g., self-report), or indirect (e.g., depletion manipulations) measurement strategies.

There are also theoretical objections to the hypothesis that the sexes differ in inhibitory ability. Bjorklund and Kipp (1996) proposed that women would be better than men at controlling themselves sexually because natural selection had forged stronger domain-specific sexual self-control in women. However, the notion that self-control evolved in domain-specific ways is controversial. Recent research has suggested that self-control is largely trait-like and domain-general, as those who possess it experience a range of favorable outcomes, including intellectual performance, interpersonal relationship quality, and mental health (Tangney et al., 2004). Similarly, the famous "marshmallow test" study demonstrated that the extent to which preschoolers could delay gratification predicted higher SAT scores and fewer social and emotional problems in adulthood (Mischel, Shoda, & Rodriguez, 1989).

Furthermore, the use of intentional control to adhere to social norms and beliefs could be a recently evolved adaptation, emerging during a period where sexual selection pressures were relatively weak (Eastwick, 2009). Instead, intentional control may have evolved to limit the influence of a wide range of (relatively ancient) impulses, including some mating-relevant drives, in situations where those impulses conflict with norms and other requirements of human culture (Baumeister, 2005; Eastwick, 2009). That is, the ability to use intentional control as a broad, domain-general resource may have been a critical adaptation that aided humans in conforming to cultural norms and forming cohesive groups (Baumeister, Masicampo, & DeWall, 2009). If intentional control evolved as a general ability to temper evolutionarily older drives, this ability should be similarly strong for men and women, as both sexes would need to resist temptations to remain valued members of a group culture.

The Current Research

We predicted that the sex difference in the tendency to succumb to a sexual temptation emerges because men experience stronger sexual impulses than women, not because they possess weaker intentional control ability. We tested two hypotheses across two studies. Hypothesis 1 was that men will succumb to inappropriate sexual temptations (i.e., engage in behavioral enactment) more than women. Hypothesis 2 was that this sex difference will be a function of men's stronger impulses, not their weaker intentional control. In Study 1, we obtained explicit measures of impulse strength and intentional control, and in Study 2, we obtained implicit measures of these same two constructs using a variant of a popular social cognitive procedure (Payne, 2001).

Also, we assessed individual difference measures to establish the validity of the mechanistic variables central to Hypothesis 2 (i.e., impulse strength, intentional control). Given the prior literature, we anticipated that (a) our explicit measure of sexual intentional control (Study 1) should correlate with an explicit measure of trait self-control (Tangney et al., 2004; see Gailliot & Baumeister, 2007); and (b) our implicit measure of sexual intentional control (Study 2) should correlate with an implicit measure of executive control (Stroop, 1935; see Miyake et al., 2000). We were unsure whether explicit and implicit measures of control would

correlate in our studies given that such correlations are often negligible (Duckworth & Kern, 2011). In addition, we collected an explicit measure of sex drive in both studies. We expected this measure to correlate with the self-report measure of sexual impulse strength (Study 1), but not the indirect measure of impulse strength (Study 2) because explicit and implicit measures of romance-relevant impulses also correlate weakly (Eastwick, Eagly, Finkel, & Johnson, 2011; Hofmann, Friese, & Gschwendner, 2009).

Study 1

In Study 1, we asked participants to report on a salient incident in which they had experienced an inappropriate attraction. Consistent with Hypothesis 1, we expected that men would report having acted on this attraction more than women. In addition, consistent with Hypothesis 2, we predicted that this sex difference in behavioral enactment would be mediated by impulse strength, not attempts to exert intentional control. To demonstrate convergent validity, we also assessed explicit measures of trait-level sex drive and self-control that we expected to correlate with the mechanistic measures of impulse strength and intentional control, respectively. Finally, we examined an interactive prediction that follows from some self-regulation perspectives (e.g., Finkel et al., 2012; Hofmann, Gschwendner, Friese, Wiers, & Schmitt, 2008). Specifically, impulse strength and intentional control may interact such that impulses primarily affect behavior when the reflective system is not activated; when inhibition is strong, the power of the impulse to determine behavior may be reduced.

Method

Participants. Participants were 218 Mechanical Turk users (70 men, 148 women) who completed the approximately 10-min study for a payment of $0.50. They were 32.3 years old on average (SD = 11.6, range = 18-70); 6% identified as African American, 4% as Asian, 77% as Caucasian, 7% as Hispanic, 1% as Native American, and 5% as biracial/other. All were living in the United States.

Materials and procedure. First, the instructions prompted participants to describe ". . . the first instance that comes to mind from your life that fits the following description: You were attracted to someone who you felt it was wrong to pursue." In addition to the 218 participants that comprise our sample, three participants who could not recall such an experience, two participants who wrote nothing, and two participants who described more than one specific experience were excluded from the analyses. After writing the description, participants responded to a set of checkboxes regarding the content of their experience: 38% of descriptions involved "someone who was a 'bad match' for you," 36% involved "an individual already in a relationship," 29% involved "someone other than the person who was your current partner," 4% involved "a friend's ex or family member," and 14% responded "none of the above" (participants could select more than one checkbox).

Next, the participants completed a set of items that were modeled off of those used in experience-sampling work of Hofmann, Vohs, Förster, and Baumeister (2012). In this prior work, participants completed items assessing desire strength, resistance, and behavioral enactment about a recent desire that they had experienced. For this study, we generated a 5-item measure of *sexual impulse strength* ("How strong was the arousal you experienced?" "How strong was the desire you experienced?" "How strong was the sexual impulse you experienced?" "How strong was the attraction you experienced?" "How strong was the temptation you experienced? $\alpha = .93$), a 4-item measure of *intentional control attempts* ("I did everything I could to resist the desire/impulse," "I exerted myself to resist the desire/impulse," "I was motivated to resist the desire/impulse," "I did nothing to resist the desire/impulse" [reverse-scored]; $\alpha = .87$), and a 5-item *behavior enactment* dependent measure ("I made every attempt to act on the desire/impulse," "I did everything I could to act on the desire/impulse," "My behavior clearly indicated that I was acting on the desire/impulse," "I romantically pursued the person who inspired the desire/impulse," "I did not act upon the desire/impulse in any way" [reverse-scored]; $\alpha = .93$). The instructions explained that "acting" on the impulse can include any relevant behavior (e.g., kissing, making out, having sex, etc.). A fifth control attempts item was deleted because it reduced the reliability of the measure.

A factor analysis of these 14 items (principal axis factoring with promax rotation) suggested three factors according to parallel analysis (Fabrigar, Wegener, MacCallum, & Strahan, 1999), and the 14 items loaded accordingly. The latent factors correlated $r = .41$ for impulse-behavior, $r = -.67$ for control-behavior, and $r = -.21$ for impulse-control. Participants used a scale from 1 (*not at all*) to 9 (*extremely*) to complete the sexual impulse strength items (M = 7.1, SD = 1.7), and they used a scale from 1 (*strongly disagree*) to 9 (*strongly agree*) to complete the intentional control attempts (M = 5.8, SD = 2.3) and behavior enactment (M = 4.2, SD = 2.7) items. We standardized these variables (M = 0, SD = 1) in the analyses reported below. For auxiliary analyses, participants used a 1 (*strongly disagree*) to 9 (*strongly agree*) scale to complete the Tangney et al. (2004) 13-item measure of *self-control* (e.g., "People would say that I have iron self-discipline"; $\alpha = .89$) and a 2-item measure of *sex drive* ("I have a strong sex drive," "I experience sexual desire extremely frequently; $\alpha = .81$). Sex was coded −1 for men and 1 for women.

Results

Mediation analyses. Consistent with Hypothesis 1, a t test revealed that men reported greater behavior enactment than women, $M_{Men} = 4.7$, $M_{Women} = 4.0$, $\beta = -.12$, $t(153.51) = 1.92$,

Table 1. Correlations Between Mechanistic Variables and Individual Difference Measures.

	Explicit measures				Implicit measure	
	Sex drive		Self-control		Self-control	
	r	*N*	*r*	*N*	*r*	*N*
Study 1						
Sexual impulse strength	.38**	218	−.14*	218		
Intentional control attempts	.02	218	−.16*	218		
Study 2						
Attraction impulse (A parameter)	−.09	257	.04	257	−.06	141
Intentional control (C parameter)	.07	257	−.02	257	.20*	141

*$p < .05$. **$p < .001$.

$p = .057$ (equal variances not assumed, Levine's test $p = .023$). In other words, men were more likely than women to report acting on the inappropriate attraction (attempting to kiss, have sex, etc.).

To test whether this sex difference was primarily a function of men's greater sexual impulse strength or their weaker intentional control attempts (Hypothesis 2), we conducted two mediational analyses. The first analysis tested whether the effect of participant sex on behavior enactment was mediated by sexual impulse strength, whereas the second tested whether the effect of sex on behavior enactment was mediated by intentional control attempts. For both mediational analyses, the sex difference reported above (sex predicting behavior enactment) satisfied Step 1 of Kenny, Kashy, and Bolger's (1998) four steps required for mediation. For sexual impulse strength, Step 2 was supported because men reported greater sexual impulse strength than women, $\beta = -.14$, $t(200.49) = 2.45$, $p = .015$ (equal variances not assumed, Levine's test $p < .001$). In addition, Step 3 was supported because sexual impulse strength predicted behavior enactment controlling for sex, $t(215) = 6.03$, $p < .001$, and Step 4 was supported because bootstrapping analyses (5,000 resamples; Preacher & Hayes, 2004) revealed a significant indirect effect of sex on behavior enactment through sexual impulse strength, ($\beta = -.05$; 95% CI= [−.102, −.015]). In contrast, for intentional control attempts, Kenny et al.'s (1998) Step 2 was not supported: Men and women did not differ in their intentional control attempts, $\beta = .08$, $t(216) = -1.14$, $p = .254$. Thus, intentional control attempts were not a candidate for mediation. (Indeed, the indirect effect of sex on behavior enactment through intentional control attempts did not significantly differ from zero, 95% CI = [−.133, .030].) Consistent with Hypothesis 2, these data imply that men reported significantly greater behavior enactment than women because they experienced greater sexual impulses, not because they were worse at controlling those impulses.

Auxiliary analyses. The top half of Table 1 presents the correlations between the two mechanistic variables—sexual impulse strength and intentional control attempts—and the two self-report individual difference variables that we assessed (i.e., sex drive and self-control). As expected, sex drive was associated with sexual impulse strength, and dispositional self-control was associated with attempts to control the inappropriate attraction. (Sexual impulse strength also correlated negatively with dispositional self-control.) In summary, the self-report measures of sexual impulse strength and intentional control attempts used in this study correlated sensibly with the self-report individual difference measures.

Despite the lack of support for the mediational role of intentional control attempts, the analyses reported above do not suggest that control attempts were irrelevant to behavioral enactment. In fact, contemporary theories of self-regulation (e.g., Finkel et al., 2012) suggest a different model such that intentional control should moderate the pathway between the strength of the impulse and behavior enactment (Figure 1). In other words, the association of impulse strength with behavior enactment should be significant when intentional control is weak, but participants should be unlikely to enact inappropriate sexual behaviors regardless of impulse strength when intentional control is strong. We tested this moderated mediational hypothesis using the Hayes (2013) PROCESS macro for SPSS.

The interaction between the two mechanistic variables alone (i.e., the Sexual Impulse Strength × Intentional Control Attempts interaction) predicting behavioral enactment was not significant, $\beta = -.03$, $t(213) = -0.52$, $p = .600$. However, we also generated a measure of *intentional/self-control* by averaging z-scored versions of the intentional control attempts and self-control individual difference measures, and we generated a measure of *sex drive/impulse strength* by averaging the sexual impulse strength and sex drive measures. Using these measures, intentional/self-control proved to be a significant moderator of the association of the sex drive/impulse strength measure with behavior enactment, $\beta = -.10$, $t(213) = -2.00$, $p = .047$; this interaction is displayed in Figure 2. When intentional/self-control was weak (−1 *SD*), strong impulses predicted greater behavior enactment than weak impulses, $t(213) = 3.59$, $p < .001$. However, when intentional/self-control was strong (+1 *SD*),

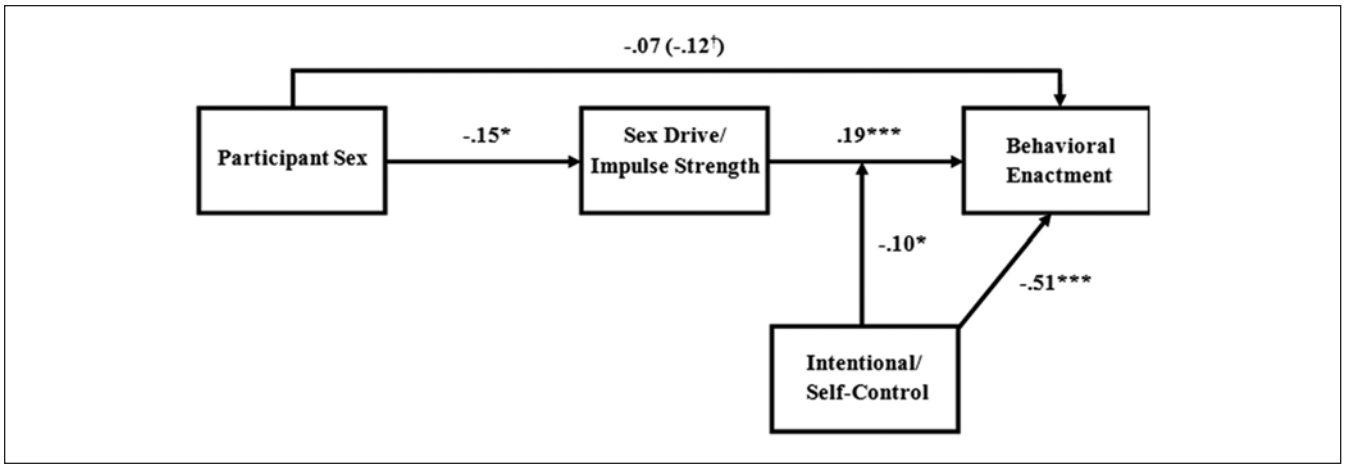

Figure 1. Study 1 mediational model. All beta weights are standardized.

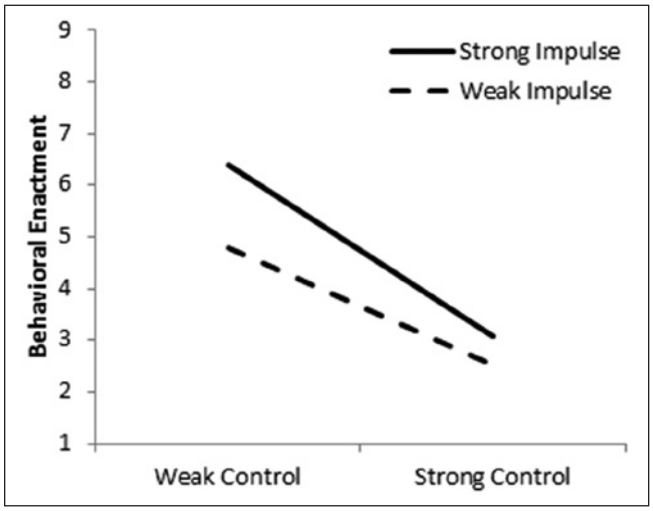

Figure 2. Study 1 Sex Drive/Impulse Strength × Intentional/Self-Control interaction predicting behavioral enactment. Slopes are presented for participants reporting weak (−1 *SD*) and strong (+1 *SD*) impulses.

impulse strength did not significantly predict behavior enactment, $t(213) = 1.61$, $p = .108$. In addition, the indirect effect of participant sex on behavior enactment through sex drive/impulse strength was significant for participants reporting intentional/self-control scores at −1 *SD*, β = −.04; 95% CI= [−.099, −.010], and at the mean, β= −.03; 95% CI = [−.066, −.006], but the indirect effect was not significant for participants reporting intentional/self-control scores at +1 *SD*, β = −.01; 95% CI = [−.043, .002]. In summary, these results suggest that men on average reported greater behavior enactment than women because they experience stronger sexual impulses, but strong intentional/self-control essentially overrides this mediational pathway by eliminating the association between sexual impulse strength and behavior enactment.

Discussion

In Study 1, we used explicit methods modeled off of the experience-sampling work of Hofmann et al. (2012) to examine sex differences in the tendency to succumb to sexual temptations. Data revealed support for both hypotheses: Men were more likely than women to succumb to the sexual temptation (H1), and this sex difference in behavior enactment was a function of impulse strength, not intentional control (H2). In addition, we documented sensible individual difference correlates of our mechanistic variables: Participants with a greater sex drive reported greater sexual impulse strength in the tempting situation, and participants with greater self-control reported that they exerted more intentional control in the tempting situation. Also, we found modest support for a moderated mediational model implied by some self-regulation perspectives (e.g., Finkel et al., 2012; Hofmann et al., 2008): The effect of impulse strength on behavior enactment was moderated by control exertion. That is, impulses tended to predict behavior when participants did not engage in self-control, but impulse strength was irrelevant to behavior enactment (and, in fact, behavior enactment was extremely low) when control exertion was strong. Furthermore, control disrupted the mediational pathway from biological sex to sexual impulses to behavior enactment. However, the moderated mediation was only reliable when we used a composite of the individual difference and mechanistic variables; it was not significant when using the situational measures of impulse strength and intentional control alone.

Study 2

Study 1 marked an initial attempt to differentiate impulsive and reflective influences on sexual behavior. Nevertheless, it is unclear whether people can accurately report on the extent to which they experienced strong impulses or exerted poor

intentional control in a given situation. Indeed, any psychological measure is unlikely to capture only impulsive processes or only reflective processes; that is, no response is process-pure. This observation surely applies to explicit self-reports like those used in Study 1, but it also applies to implicit measurement strategies (Jacoby, 1991). To address this dilemma, Jacoby (1991) developed the process dissociation procedure (PDP), which teases apart the impulsive and reflective influences on task performance. Specifically, PDP uses mathematical modeling to separate impulsive and controlled forces in studies that have both (a) situations where the two forces work in concert (i.e., congruent conditions) and (b) situations where the two forces oppose each other (i.e., incongruent conditions).

In Study 2, we developed a romantically themed variant of Payne's (2001, 2005) "weapon identification task" to examine impulsive and controlled forces separately using PDP. Consistent with Hypothesis 1, we predicted that men would perform worse than women on this task (i.e., men, relative to women, would make more errors in the incongruent than the congruent conditions). Consistent with Hypothesis 2, we predicted that men would perform worse because they experienced stronger romantic impulses than women (i.e., the A parameter in PDP; defined below), not because their intentional control attempts were weaker (i.e., the C parameter in PDP). Furthermore, we examined whether the PDP parameters were associated with an implicit measure of self-control (Stroop, 1935) as well as the same explicit measures of sex drive and self-control from Study 1. Prior research has suggested that PDP parameters on the weapon identification task correlate consistently with other implicit measures (Govorun & Payne, 2006; Payne, 2005), and so we anticipated that an association would emerge between the Stroop task and the C parameter in our data. Given the inconsistent associations between implicit and explicit measures demonstrated in prior research (Duckworth & Kern, 2011; Eastwick et al., 2011; Hofmann, Friese, & Gschwendner, 2009), we were unsure whether our explicit individual difference measures would correlate with the PDP parameters.

Method

Participants. Participants were 600 undergraduate students (326 men, 274 women) who completed the study for course credit. A subset of 345 participants was asked to report their age (M = 18.6, SD = 0.84) and race/ethnicity (3.5% African American, 7.2% Asian, 69.6% Caucasian, 13.3% Hispanic, 0.6% Native American, 3.2% Multiracial, and 2.6% Other race/ethnicity). An additional 38 participants were excluded from analyses for reporting a "1" or a "2" to the item "I am exclusively attracted to members of the opposite sex" (1 = *strongly disagree*, 9 = *strongly agree*), and two participants who reported a "9" were excluded from analyses because the experimenter accidentally assigned them to a condition where they evaluated same-sex partners.

Materials and procedure

Romantic identification task. Participants completed a modified version of the weapon identification task (Payne, 2001, Study 2). Instead of Black and White faces, the current task used photographs of romantically *desirable* and *undesirable* opposite-sex individuals, and instead of guns and tools, the current task used symbols to indicate that the opposite-sex individual needed to be accepted or rejected. To select desirable and undesirable photographs, we asked a separate sample of 43 undergraduate participants to rate 200 same- and opposite-sex faces. Photos clearly depicted one individual and were taken from a public website, where users rate people's attractiveness. Participants rated all photographs on the item "How desirable would it be to date this person?" on a scale from 1 (*not at all*) to 9 (*extremely*). The desirable photographs selected for this study averaged in the 7th percentile, whereas the undesirable photographs averaged in the 89th percentile.

Upon arrival at the laboratory, participants read a set of instructions explaining the "Partner Selection Game." In this game, they would view pictures of opposite-sex individuals who were ostensibly potential dating partners. As each photo was displayed, participants were encouraged to think about whether they would like to have the person as a romantic partner. However, participants were told that they must subsequently make an "accept" or "reject" response to each target based not on their personal feelings, but on whether the computer deemed that the potential partner was "good for you" or "bad for you." Thus, the Study 2 task corresponded to the commonly experienced "bad for you" temptation in Study 1. A symbol (Figure 3) would appear on the screen indicating that the person needed to be accepted (heart with an arrow through it) or rejected (heart with a line through it). Participants were told to accept good partners by pulling a joystick toward themselves and reject bad partners by pushing a joystick away from themselves (Chen & Bargh, 1999). The instructions told participants that they had to respond both quickly and accurately; an inaccurate response was followed by a red "X" and a slow response (greater than 450 ms) was followed by a warning, "Please try to respond faster!" A correct, quick response was followed by a green "O."

On each trial, the computer displayed the opposite-sex photograph for either 1,500 ms, or 3,000 ms (randomly determined), followed by the accept or reject symbol for 200 ms, followed by a mask. If participants pushed the joystick (i.e., rejection) on an accept trial, pulled the joystick (i.e., acceptance) on a reject trial, or took longer than 500 ms to respond (Payne, 2001), the trial was scored as an error. Participants completed 20 practice trials followed by 320 real trials (8 blocks of 40 trials, with a 30 sec rest between blocks). The photograph was 1 of 10 desirable opposite-sex photos for 20 trials in each block, whereas the photograph was 1 of 10 undesirable photos for the other 20 trials in the block.[1] *Congruent* trials required participants to accept desirable individuals or reject undesirable individuals;

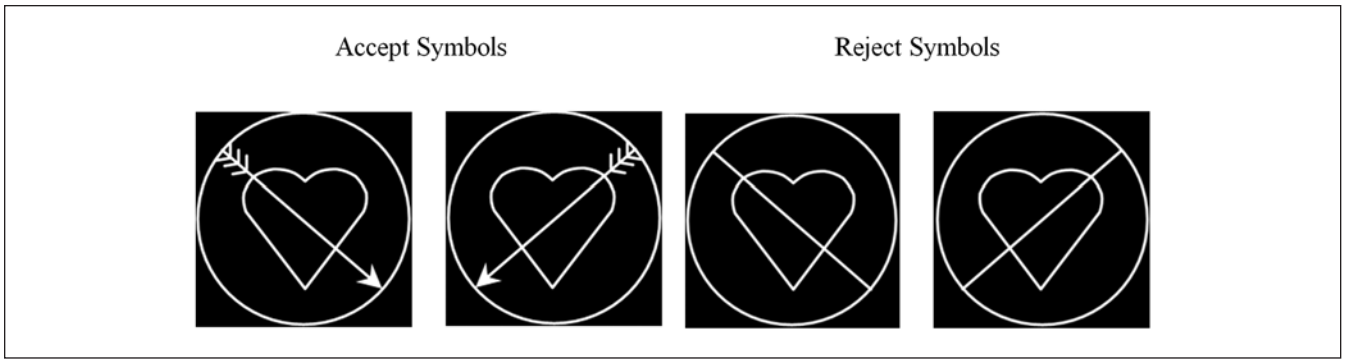

Figure 3. Study 2 accept and reject symbols.

incongruent trials required participants to reject desirable individuals or accept undesirable individuals. Participants completed equal numbers of congruent and incongruent trials, and the order of the blocks and the trials within each block were determined randomly for each participant.

Following Payne (2001, 2005), we calculated the A and C parameters for each participant using the following equations (where "P" = probability):

$$P(\text{pull}|\text{accept}) = C + A(1–C) \quad (1)$$

$$P(\text{pull}|\text{reject}) = A(1–C) \quad (2)$$

The A parameter represents the participant's impulse to accept the opposite-sex partner, whereas the C parameter represents the participant's ability to exert intentional control and provide the correct accept or reject response. The first equation indicates that a correct pull response on an accept trial could be achieved by either correctly controlling the response (C), or impulsively performing a pull response (A), if intentional control fails (1–C). The second equation indicates that an incorrect pull response on a reject trial occurs when the participant impulsively responds pull (A), if control fails (1–C). Thus, these equations reflect a "C-dominant model" (i.e., impulses operate when control processes fail), which is the appropriate model for this type of priming task (Bishara & Payne, 2009; Payne & Bishara, 2009). Values for A and C can be determined algebraically from these two equations; A and C values were calculated separately for the desirable and undesirable opposite-sex photographs.

We adopt the term "impulse" to refer to the A parameter and "control" to refer to the C parameter. This terminology is agnostic with respect to ongoing debates about the nature of the automaticity of the A parameter (i.e., unintentional, efficient, unconscious, uncontrollable), a debate that is beyond the scope of this study (Gawronski & Creighton, 2013; Payne & Bishara, 2009). Consensual conceptual definitions of the A parameter (an impulse or bias to make a particular response) and the C parameter (the ability to detect the correct response) are sufficiently precise for the present examination of sex differences.

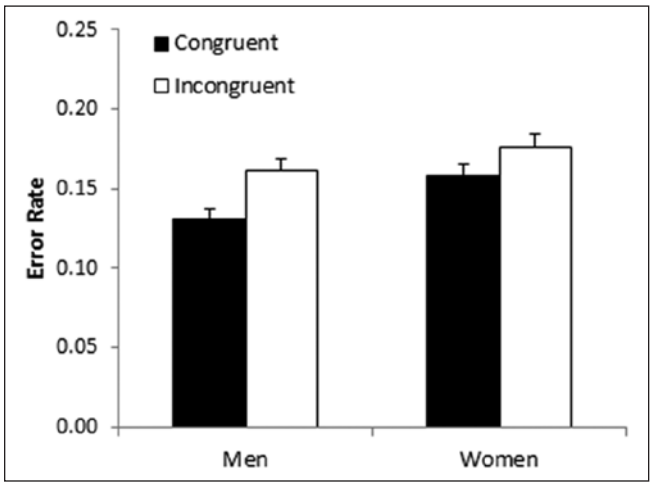

Figure 4. Study 2 error rates for the romantic identification task.

Other measures. Of the 600 participants, 141 completed a Stroop (1935) task before the romantic identification task. For the Stroop task, participants had to identify the color of the font of a word presented in the middle of the screen as quickly as possible. Participants indicated their responses by pressing the appropriate red, green, blue, or yellow keys (which had been labeled on the keyboard using stickers); each trial advanced only after the participant pressed the correct key. Stroop scores for each participant were calculated as the average reaction time (in ms) on compatible trials (i.e., the name of a color presented in the same color font) minus the average reaction time on incompatible trials (i.e., the name of a color presented in a different color font). Thus, higher scores indicate greater executive control than lower scores. In addition, a different subset of 257 participants completed the Study 1 measures of self-control ($\alpha = .86$) and sex drive ($\alpha = .92$).

Results

Process dissociation analyses. Figure 4 presents the error rates on the romantic identification task separately by trial type (congruent vs. incongruent) and sex. A repeated-measures

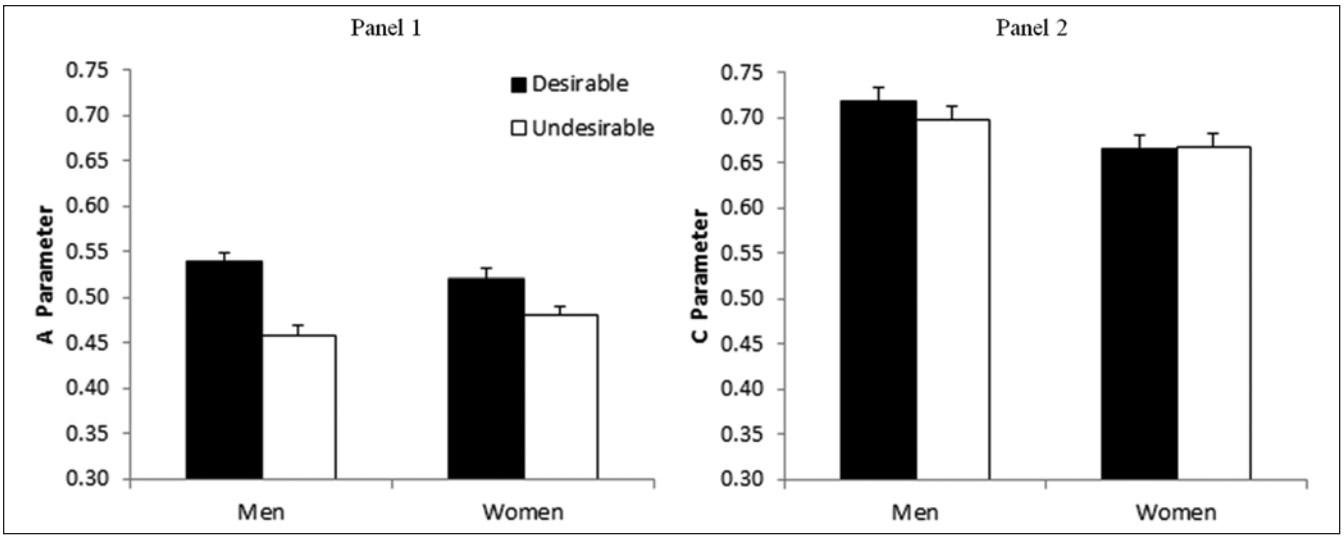

Figure 5. Study 2 process dissociation parameters for the romantic identification task. The A parameter (Panel 1) indicates the tendency to impulsively perform an "accept" response, and the C parameter (Panel 2) indicates the tendency to correctly control the response. Parameters are presented separately for desirable and undesirable partner photographs.

ANOVA revealed a significant effect of trial type, $F(1,598) = 58.36$, $p < .001$, and a significant effect of participant sex, $F(1,598) = 4.30$, $p = .039$.[2] Consistent with our first hypothesis, trial type affected men's error rates more than women's, Sex × Trial Type interaction, $F(1,598) = 4.31$, $p = .038$. Although women made more errors on the incongruent than the congruent trials, $F(1,598) = 13.67$, $p < .001$, this difference was significantly larger for men, $F(1,598) = 49.00$, $p < .001$. That is, the desirability of the opposite-sex partner affected men's responses more than women's.

To test whether this sex difference was primarily a function of men's greater impulse strength or their weaker intentional control, we calculated the A and C parameters. The A parameters are presented separately by sex and by partner desirability in Figure 5, Panel 1. Results revealed a significant effect of partner desirability, $F(1,598) = 39.91$, $p < .001$, and a nonsignificant effect of sex, $F(1,598) = 0.31$, $p = .860$. Consistent with our second hypothesis, the Sex × Desirability interaction was significant, $F(1,598) = 4.10$, $p = .043$. Women experienced stronger impulses to accept desirable than undesirable opposite-sex partners, $F(1,598) = 8.59$, $p = .004$, but this difference was significantly stronger for men, $F(1,598) = 38.63$, $p < .001$. That is, men performed worse than women on the partner selection game (in part) because men's impulses to respond "accept" were much stronger for desirable than for undesirable opposite-sex partners.

Finally, the C parameters are presented separately by sex and by partner desirability in Figure 5, Panel 2. The pattern of means challenges the possibility that men's control attempts were worse than those of women. Results revealed a significant effect of partner desirability, $F(1,598) = 6.81$, $p = .009$, as well as a significant effect of sex such that men exhibited *larger* C parameters than women (i.e., men were better able to exert control and provide the correct response than women), $F(1,598) = 4.39$, $p = .037$. In addition, the Sex × Desirability interaction was significant, $F(1,598) = 9.09$, $p = .003$. The difference in C parameters between the desirable and undesirable trials was significant for men, $F(1,598) = 17.00$, $p < .001$, but not for women, $F(1,598) = 0.07$, $p = .785$. That is, men exhibited greater control than women during the task, especially on the desirable trials. Overall, the data are consistent with the suggestion that men performed worse than women on the romantic identification task because they experienced a strong impulse to respond "yes" to the desirable opposite-sex targets, not because they failed to exert intentional control over their responses to desirable opposite-sex targets.

Auxiliary analyses. The bottom half of Table 1 presents the associations between the individual difference variables that we assessed and the impulse strength (A) and intentional control (C) parameters. For simplicity, we averaged the two A parameters (i.e., desirable and undesirable) and the two C parameters for these analyses, but hypothesis tests reveal identical conclusions if we examine the two A and two C parameters separately. The self-report individual difference variables (i.e., self-control, sex drive) failed to correlate with either the A or C parameters. However, Stroop performance was significantly associated with the C parameter; participants with better executive control were better able to control their responses on the romantic identification task. In short, the implicit measure of intentional control used in this study (the C parameter) correlated with another indirect measure of self-control (the Stroop; see also Govorun & Payne, 2006), but not self-report measures of self-control. The A parameters were unrelated to our individual difference variables (except for participant sex, of course), perhaps because we did not possess an indirect measure of romantic impulses.

In another validation analysis, we eliminated the 500-ms response window in an attempt to replicate Payne's (2001) validation of his original task. Payne (2001) found that longer response windows allowed participants to exert control (i.e., C increased) but did not affect their impulse to respond "gun" (i.e., no difference on A). To examine whether this pattern existed in our own dataset, we analyzed participants' error rates without imposing the 500-ms deadline. (Participants' responses were recorded even if they responded after the deadline.) As in Payne (2001), the C parameter was much higher (.89) with no response deadline than with the 500-ms response deadline (.69). This difference is significantly larger than the very small difference that emerged on the A parameters (.47 vs. .50), $F(1,599) = 473.13$, $p < .001$. This analysis suggests that on trials where participants (inappropriately) took extra time before making a response, their control exertion improved, but their impulses changed very little.

Discussion

This study used social cognitive methods to cleanly isolate impulsive and intentional control forces on behavior. Consistent with Hypothesis 1, men were more affected by the desirability manipulation than women. This finding is consistent with the suggestion that men are more likely to succumb to sexual temptations than women: They have a harder time behaving appropriately when that behavior is inconsistent with their impulses. Although we could not test Hypothesis 2, using mediational techniques in this study because we did not possess distinct measures of behavioral enactment, impulse, and control, we could use PDP to break down our behavioral enactment variable (i.e., the error rates) into the component impulsive and controlled elements, which is arguably more appropriate than mediation for our research question. Consistent with Hypothesis 2, men experienced a much stronger impulse to "accept" (i.e., the A parameter) the desirable than the undesirable partners, whereas this difference was much smaller for women. In other words, stronger impulses were partly responsible for men's poorer performance on the task. If anything, men's intentional control (i.e., the C parameter) was stronger than women's, especially in the desirable condition. Thus, the sex difference in the tendency to succumb to inappropriate temptations on this task cannot be due to men's worse intentional control exertion relative to women.

One alternative explanation for men's poor performance is that they were more attentive to the physical attractiveness of the opposite-sex target than women, not that they experienced stronger sexual impulses than women. This alternative framing—men's attention is more likely than women's to be impulsively drawn to attractive targets, but men do not possess worse control over their attention—is compatible with our theoretical analysis. Furthermore, there is some empirical precedent for the hypothesis that attractiveness manipulations should affect men's implicit responses more than women's (Maner, DeWall, & Gailliot, 2008; Maner, Gailliot, & DeWall, 2007), although this trend fails to emerge in many studies (Eastwick et al., 2011; Maner et al., 2003, Study 4). We could not address this alternative explanation in Study 2, but we did possess in Study 1 a two-item assessment of the *physical attractiveness* of the target of the inappropriate attraction (e.g., "I found him/her to be extremely physically attractive"; $\alpha = .81$). The key mediational indirect effect of participant sex on behavioral enactment through sexual impulse strength remained significant in Study 1 when controlling for the target's physical attractiveness ($\beta = -.04$; 95% CI = [−.082, −.003]). Therefore, the sex differences we found in that study regarding real-life, consequential temptations are unlikely to be solely attributable to physical attractiveness.

General Discussion

This research project tackles a critical current issue in psychology: How can scholars identify whether people engage in a behavior because (a) they experienced an extremely strong impulse or (b) they were unable to exert control over that impulse? There is a particular need to understand these processes in the romantic domain; research on sexual infidelity has underappreciated the vital theoretical distinction between impulse and control, so this work adds needed clarity to this literature. In summary, men appear to be more likely to succumb to sexual temptations because they experience stronger sexual impulses than women, not because they are less able to exert intentional control than women. These hypotheses were supported using a self-report methodology that asked participants to report on a salient real-life experience where they were confronted with a strong sexual temptation (Study 1) as well as an implicit procedure that uses mathematical modeling to separate impulsive and controlled processes (Study 2). In addition, in both studies, we documented several sensible individual difference correlates of our impulse and intentional control measures, which attest to the validity of these measures.

These data are consistent with contemporary evolutionary psychological perspectives that generate predictions by drawing from information about the time course of human evolution (i.e., phylogeny; Fraley, Brumbaugh, & Marks, 2005; Gosling & Graybeal, 2007). Eastwick (2009) argued that the order in which different adaptations evolved in the lineage leading up to Homo sapiens carries implications for how these adaptations intersect to predict mating behavior (Eastwick & Finkel, 2012). Of relevance to the current study, humans evolved the ability to use self-control in the service of sexual norms and goals; in fact, this event may have taken place as recently as 50,000 years ago (i.e., very recently in our evolutionary history) with the emergence of transmitted culture. Self-control could have operated as an "adaptive workaround"—an evolutionary corrective designed to limit the deleterious effects of other previously evolved urges that

threatened Homo sapiens' ability to comply with cultural norms and serve as valued group members (Baumeister, 2005; Baumeister et al., 2009). Given that the ability to function well within a culture should not have been sex differentiated in humans' ancestral past, self-control should limit the influence of other evolved impulses to a similar extent for men and women. However, sex differences could certainly characterize the strength of the sexual impulse, as sexual impulses have a considerably older evolutionary origin (Eastwick, 2009).[3] Thus, the present data are consistent with—and demonstrate the utility of—the phylogenetic perspective: Men may succumb to sexual temptations more often than women because they experience stronger sexual impulses, but this sex difference diminishes when people exert their (recently evolved) self-control abilities.

Strengths and Limitations

These studies have several complementary strengths. Using very different explicit and implicit methods, we replicated the well-established finding that men are more likely to succumb to sexual temptations than women (Petersen & Hyde, 2010; Schmitt et al., 2004). Furthermore, both methods converged on the same mechanism underlying this sex difference: Men have stronger sexual impulses than women, not weaker intentional control abilities. Given that the retrospective (Study 1) and process dissociation (Study 2) methods were so different from each other, the consistency of the results should promote confidence in the obtained effects. In addition, a major strength of this work is that it goes beyond the mere identification of a sex difference to illuminate the underlying psychological processes (e.g., Vandello, Bosson, Cohen, Burnaford, & Weaver, 2008). Indeed, these studies represent the first work to combine self-regulation (Hofmann, Friese, & Strack, 2009) and evolutionary (Eastwick, 2009) perspectives to better understand sex differences.

Nevertheless, this work does have limitations that can be addressed by additional research. First, we did not examine participants' *motivation* to engage in self-control in a particular situation. Our instructions for both studies rendered this variable equivalent for men and women by specifically referring to partners who were "off limits," but a larger process model could incorporate this variable. For example, men may be more inclined than women to pursue sexual encounters with strangers (Buss & Schmitt, 1993; Clark & Hatfield, 1989) not because they experience stronger impulses or weaker self-control, but rather because these sexual behaviors conflict with women's but not men's personal goals (e.g., the goal not to be labeled "easy"). In short, other sex differences may derive from self-regulation–relevant variables that do not neatly fit into the categories of impulse and control. Second, we did not distinguish between short- and long-term romantic temptations. Rather, these studies explored the nonspecific blend of immediate sexual desires and romantic feelings that pervades relationship initiation contexts, including ill-advised sexual encounters (Eastwick, in press). The self-regulatory processes we identified should function similarly across short- and long-term contexts, as both contexts would presumably include a sexual temptation that conflicts with the goal of not succumbing to the temptation. Yet, future research might examine this distinction; for example, the size of the sex difference could be larger in short-term contexts.

In addition, the two studies each had unique limitations. First, although the Study 1 results matched predictions, it is unclear to what extent people can accurately differentiate between impulsive and reflective processes underlying their behavior in self-reports (Nisbett & Wilson, 1977). Although other researchers have achieved fascinating insights about self-regulation in real life by asking nearly identical items of participants (Hofmann et al., 2012), our participants were retrospecting about an incident from their past and could have exhibited memory biases. For this reason, it was critical that we documented similar results using an implicit task in Study 2. Second, future research should continue to explore the validity of the Study 2 PDP procedure. Previous research has demonstrated that the A parameter is positively correlated with other implicit measures (e.g., the IAT; Payne, 2005), but we did not include such a measure in our study, so we cannot be sure that impulsive responses to sexually appealing stimuli show similar consistency across tasks. Also, it would be useful for future research to blend the strengths of Studies 1 and 2, perhaps by examining how the A and C parameters predict people's responses to real-life inappropriate sexual temptations. Additional evidence that the PDP parameters correspond to other validated measures and behavioral outcomes would provide researchers with a fuller understanding of these findings.

Conclusion

Failing to exercise self-control in daily life can undermine long-term well-being (Baumeister et al., 1994). Although the initial wave of self-control research did not specifically focus on the sexual/romantic domain, some recent studies have begun to examine this topic (Gailliot & Baumeister, 2007; Pronk, Karremans, & Wigboldus, 2011). By applying the self-regulation perspective, researchers can achieve a more precise understanding of *how* the sexes differ in the romantic domain, while simultaneously informing broader theoretical perspectives on sex differences. Future studies that address the intersection of these "how" questions with evolutionary "why" perspectives are sure to reveal new insights about self-regulation.

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Notes

1. Of the 600 participants, 267 completed a modified task in which we presented a desirable opposite-sex photo for 14 trials in each block, an undesirable opposite-sex photo for 14 trials in each block, and a medium-desirability opposite-sex photo for 12 trials in each block.To ensure that these 267 participants could be combined with the other 333 participants, we ignored the 12 medium-desirability trials. A dummy code indicating which version of the task participants completed did not significantly moderate any of the process dissociation analyses, *p*s > .564.
2. This main effect of sex (i.e., men made fewer errors than women) is not relevant to our hypotheses, as it could emerge for reasons that are irrelevant to susceptibility to inappropriate romantic impulses (e.g., men are faster with a joystick than women). The Sex × Trial Type interaction is the appropriate test of sex differences in task performance as it tests whether men and women differed in the tendency to succumb to inappropriate sexual temptations. This conceptualization of task performance is consistent with other commonly used implicit tasks (Stroop, 1935): Scores on these tasks are calculated not as overall reaction times or error rates but rather as reaction time/error rate *differences* between congruent and incongruent conditions.
3. The present data cannot address whether the sex difference in sexual impulse strength emerges as a result of (a) sex-differentiated adaptations that are specific to sexuality (Buss & Schmitt, 1993), (b) domain-general observational and operant learning mechanisms that produce sex differences in modern Western contexts (e.g., Burt & Estep, 1981), or (c) some combination of these factors.

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