

the general theory of crime: how general is it?

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Gottfredson and Hirschi's (1990) general theory of crime is one of the most widely cited in the deviance literature (Wright 2000), and has been used to predict several analogous (i.e., deviant) behaviors. However, there remain questions that have not been adequately addressed in previous research. First, there are deviant behaviors that might be explained by the general theory that have not yet been explored. Second, previous research has not shown the extent to which self-control can explain *specific* forms of deviance as opposed to deviant behavior in general. Finally, extant self-control literature has placed an emphasis on establishing a link between self-control and negative outcomes. However, self-control has not been used to explain socially acceptable forms of risky behavior. In this study we attempt to address these limitations by determining if self-control affects analogous behaviors such as risky driving, risky sex, academic dishonesty, and pathological gambling. To ascertain if self-control affects

Received 14 July 2003; accepted 7 January 2004.

A previous version of this paper was presented at the 2002 American Society of Criminology Meeting, Chicago, IL, November 12–16.

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specific forms of behaviors, we examine each of these variables separately rather than including them in indices. We then explore the link between self-control and socially accepted forms of risky behaviors, such as bungee jumping and skydiving. Finally, we discuss the findings of this research as well as the limitations and possible directions for future research.

THE GENERAL THEORY OF CRIME: HOW GENERAL IS IT?

One of the most influential contemporary theories in the deviance literature is Gottfredson and Hirschi's (1990) general theory of crime. The authors and the general theory are among the most widely cited in the deviance literature (Wright 2000), and empirical accounts of the theory's validity are numerous (e.g., Arneklev et al. 1999; Burton et al. 1999; LaGrange and Silverman 1999). Pratt and Cullen (2000), based on their meta-analysis, concluded that the general theory's primary construct of self-control was a robust predictor of crime and analogous behaviors as indicated by the fact that its effect size was one of the strongest in the literature, even when other theoretical constructs (e.g., peers) were included.

These findings are consistent with Gottfredson and Hirschi's (1990) generality hypothesis in that self-control not only predicts offending behavior, but also analogous behavior. Analogous behaviors are those that, while not criminal, are similar in that they satisfy immediate desires to the detriment of long-term consequences. Examples of analogous behaviors include smoking, drinking, using illicit drugs, having children out of wedlock, and engaging in risky sexual behavior. The fact that the general theory can explain analogous behaviors (Arneklev et al. Grasmick, Tittle, and Bursik 1993; Burton et al. 1998; Cochran et al. 1998), and often just as well as it explains offending behavior (Evans et al. 1997; Paternoster and Brame 1998; Pratt and Cullen 2000), suggests that Gottfredson and Hirschi's theory is not just a general theory of crime, but of deviant behavior as well.

Yet, there are compelling questions that have not been answered in previous research, such as the relationships between self-control and specific acts of deviant behavior,

as well as the scope of the general theory. In regards to specificity, many accounts linking self-control to deviant acts have collapsed a variety of deviant behaviors into scales or indices. While this approach can ascertain the relationship between self-control and deviance in a generic fashion, it does not reveal how, if at all, self-control is related to specific acts of deviance. A related notion involves the scope of deviant behaviors examined in previous research. For instance, Gottfredson and Hirschi (1990) suggest that individuals low in self-control are likely to engage in risky sexual behavior, although this speculation has not been empirically confirmed. Additionally, previous studies have focused on the relationship between self-control and antisocial deviant behaviors. Yet, an important element of self-control is a preference for exciting and thrilling experiences. Thus, to the extent this preference for risk-taking is characteristic of such individuals, self-control might be related to socially accepted forms of risky behavior.

In this study, we seek to investigate these issues empirically. First, we explore how well the construct of self-control can explain a wide variety of specific antisocial deviant behaviors, including risky driving, risky sex, academic dishonesty, and pathological gambling. Some of these behaviors have never been assessed in previous research. In addition, we investigate the relationship between self-control and socially accepted risky behavior, specifically examining thrill and adventure seeking behaviors (e.g., skydiving). The tendency to examine only antisocial deviant behaviors might be overly restrictive and limit the applicability of the general theory. These analyses will test the extent to which Gottfredson and Hirschi's (1990) theory can explain a wide range of deviant behaviors (encompassing both antisocial and socially accepted risky behavior), thus providing an assessment of the theory's generality hypothesis. It also will demonstrate the need (or lack thereof) for researchers to broaden their definition of deviance by including socially accepted risky behaviors.

BACKGROUND

As mentioned above, Gottfredson and Hirschi's (1990) notion of self-control is related to a wide variety of deviant

(i.e., analogous) behaviors (Forde and Kennedy 1997; Gibbs, Giever, and Martin 1998; Wood, Pfefferbaum, and Arneklev 1993). Moreover, studies have demonstrated that self-control predicts involvement in deviant behaviors just as well as it does criminal behaviors (Evans et al. 1997; Paternoster and Brame 1998). One of the questions left unanswered by previous research, though, is how well self-control predicts specific acts of deviance. A wealth of studies have revealed that self-control is a robust predictor of (licit and illicit) substance use (Arneklev et al. 1993; Cochran, Wood, and Arneklev 1994; Gibbs and Giever 1995; Nakhaie, Silverman, and LaGrange 2000; Sorenson and Brownfield 1995; Vazsonyi et al. 2001; Winfree and Burnat 1998; Wood et al. 1993). Relatedly, self-control predicts both intentions (Piquero and Tibbetts 1996) and actual engagement in drinking and driving (Keane, Maxim, and Teevan 1993). However, other forms of risky driving have only been included in indices (Hartos et al. 2000), leaving unanswered what additional specific types of risky driving might be related to self-control.

Another specific form of deviance noted in several studies is the relationship between self-control and various forms of antisocial behavior in academic settings. Those who are low in self-control are more likely to miss or cut class (Arneklev, Cochran, and Gainey 1998; Cochran et al. 1994; Gibbs and Giever 1995). Additionally, individuals low in self-control are more likely to engage in a variety of forms of academic dishonesty (Cochran et al. 1998), a relationship that holds even when controlling for previous level of academic dishonesty (Gibbs et al. 1998). These findings are noteworthy because they suggest that the effect of low self-control on antisocial behavior is evident even among relatively low risk populations (such as those enrolled in college).

Much less is known about the relationship between self-control and other forms of deviance. For example, risky sex and gambling behaviors have only been included within deviance indices (e.g., Paternoster and Brame 1998; Wood et al. 1993), a strategy that does not reveal whether self-control is explicitly related to these behaviors. Arneklev et al. (1993) found that self-control was a significant predictor of *liking* to gamble, yet it remains unclear whether self-control predicts *actual* gambling behavior, especially more severe forms of it. Given the costs placed on individuals

and society of risky sex (Hoyle, Fejfar, and Miller 2000) and problematic gambling (National Research Council 1999), it is important to understand what factors are related to these behaviors.

Perhaps the largest gap in the self-control literature is the extent to which self-control can predict socially accepted forms of risky behavior that are atypical, or deviant, in that most individuals do not engage in them. Within the self-control literature there has been an emphasis on establishing a link between self-control and negative outcomes. This is partially due to Gottfredson and Hirschi's (1990) discussion of the many manifestations of low self-control. Citing an extensive literature, they note that individuals low in self-control engage in a wide variety of criminal and antisocial deviant (i.e., analogous) behaviors. They even state that crime may be the least important consequence of low self-control:

the 'costs' of low self-control for the individual may far exceed the costs of his criminal acts. In fact, it appears that crime is often among the least serious consequences of a lack of self-control in terms of quality of life of those lacking it (Gottfredson and Hirschi 1990:94).

However, one of the key elements of self-control is risk-taking. While Gottfredson and Hirschi focus on the "exciting, risky, and thrilling" aspects of *criminal* acts, there are a variety of risky behaviors that are neither criminal nor which elicit negative reactions from others (:89). Behaviors such as skydiving and bungee jumping inherently involve risk, yet these behaviors are not considered to violate social norms. At the same time, such behaviors are deviant in the sense that only a minority of individuals engage in them. Because previous studies drawing upon the general theory have not explored the relationship between such socially accepted risky behaviors and self-control, it is unclear how, if at all, they are related.

Drawing from other theoretical perspectives, the failure to include socially accepted forms of risky behavior might be an oversight. Zuckerman (1994) has put forth a biosocial model of sensation seeking whereby he suggests that some individuals have a predisposition to seek out thrilling, exciting, and risky experiences. However, he notes that the

expression of this predisposition is dependent upon social factors. Farley (1981) advocates a similar model of sensation seeking, suggesting that although individuals may share a common underlying sensation seeking predisposition, the social context in which they live can affect the specific manifestation. Thus, an individual who ranks high on sensation seeking who lives in a poor neighborhood might become a substance user to satisfy his or her need for thrilling experiences, whereas a person who ranks high on sensation seeking who resides in a wealthier community might try bungee jumping. From these accounts, sensation seeking predispositions might eventuate in antisocial or socially acceptable forms of risky behavior, depending on social factors.

Sensation seeking is closely linked to the notion of impulsivity (Zuckerman and Kuhlman 2000), and recent investigations have revealed that impulsivity (like sensation seeking) can present itself in a variety of ways. Dickman (1990) found that impulsivity can either be functional or dysfunctional in its expression. Functional impulsivity refers to acting spontaneously when such a response is optimal, such as in an emergency. Dysfunctional impulsivity refers to a similar process whereby an absence of careful contemplation before action leads to negative outcomes, such as crime. Whiteside and Lynam (2001) have conducted an exhaustive review of the impulsivity literature and concluded that there are different variants of impulsivity. They suggest that functional impulsivity belongs to a broader category of impulsivity they label sensation seeking. Further, they suggest that another variant of impulsivity, (lack of) preponderance, encompasses Dickman's dysfunctional impulsivity. What these investigations collectively suggest is that impulsivity can have both antisocial and socially acceptable manifestations.

The impulsivity literature is relevant in the current discussion because the constructs of impulsivity and self-control share substantial overlap (Arneklev et al. 1999; LaGrange and Silverman 1999). Moreover, Gottfredson and Hirschi (1990) explicitly note that individuals low in self-control prefer risky over mundane experiences. Thus, the multifaceted nature of self-control, much like impulsivity (Whiteside and Lynam 2001), might be related to a variety of antisocial deviant behaviors *and* socially accepted forms of risky behavior. Additionally, to the extent self-control is

related to both types of behavior, it is unclear how these behaviors will be related to one another and self-control. Gottfredson and Hirschi would suggest that individuals low in self-control would engage in both types because there is no specialization in the behavioral expression of self-control. Zuckerman (1994) and Farley (1981) offer an opposing hypothesis: The behavioral expression of sensation seeking is channeled by social context and is more likely to eventuate in *either* antisocial *or* socially accepted forms of risk taking.

In this study, we extend and supplement the existing literature on self-control and deviant behavior in several respects. Many previous accounts have assessed the relationship between self-control and deviance with the use of indices. For example, risky sex and gambling behavior have been included within deviance scales. In our analyses, we investigate how well self-control can explain these particular behaviors. Additionally, we include risky driving and academic dishonesty in our analyses in an effort to replicate findings from previous studies. Finally, no study to date has examined how well the construct of self-control can explain socially accepted risky behavior, and whether there is any degree of specialization among individuals low in self-control between these two types of behaviors. To the extent self-control can predict socially accepted risky behavior, the scope of the general theory can be greatly expanded. Moreover, if there is evidence of specialization whereby individuals low in self-control have a tendency to engage in *either* antisocial deviance *or* socially accepted risky behavior, *but not both*, modifications to the general theory would seem in order.

METHODS

Sample

The data for this study came from a sample of 254 college students attending a large midwestern state university who were enrolled in sociology classes. Because the sociology courses satisfied requirements for general education, a wide range of students with varied academic interests and backgrounds were represented. Moreover, these classes ranged from introductory courses to upper-level courses, which

provided a full range of students from first-year freshmen to final-year seniors. While there are advantages of using such a sample (Arneklev et al. 1998; Cochran et al. 1998; Gibbs and Giever 1995; Gibbs et al. 1998; Tibbetts and Myers 1999), the generalizability of our findings are somewhat compromised as well.

Measurement of Variables

Self-Control

To measure self-control, we used the Grasmick, Tittle, Bursik, and Arneklev (1993) 24-item scale. The scale was developed to measure the many facets of self-control, and thus incorporates impulsivity, risk seeking, a preference for physical activities and simple tasks, self-centeredness, and a short temper. Respondents chose from a four-item Likert scale that ranged from 1 ("agree strongly") to 4 ("disagree strongly"). We created an additive scale using the 24 items ($\alpha = .83$) with higher scores indicative of greater self-control (see Table 1).

Risky Driving

To assess risky driving behaviors (see Table 1), we used four single-item indicators: (1) I drive above the speed limit; (2) I follow vehicles in front of me closely; (3) I drive without a seatbelt; and (4) How many times have you driven a vehicle after you had consumed alcohol? Responses for the first three variables ranged from 0 ("never") to 4 ("always"). For the drunk driving variable, the responses ranged from 0 ("never") to 4 ("more than nine times").

Risky Sex

Hoyle et al. (2000) suggest that the most notable risks involving sex are unintended pregnancy and STD contraction, and having unprotected sex, multiple partners, and high risk encounters (e.g., unknown partners) substantially increase those risks. Thus, to assess risky sex we used four single-item indicators: (1) How many times have you had sexual intercourse without a condom?; (2) How many times have you had sexual intercourse without using any form of

TABLE 1 Descriptive Statistics for Study Variables

Variable	Metric	Descriptive statistics		
		Mean	S.D.	Range
Self control	(37 = low self control...; 91 = high self control)	67.98	8.88	37–91
Risky driving				
I drive the speed limit	(0 = never, 4 = always)	2.65	0.95	0–4
I follow vehicles closely	(0 = never, 4 = always)	1.73	0.90	0–4
I drive without a seatbelt	(0 = never, 4 = always)	0.77	1.19	0–4
# of times driven after drinking	(0 = never, 1 = 1–2 times, 2 = 3–5 times, 3 = 6–9 times, 4 = more than 9 times)	1.34	1.50	0–4
Risky sex				
Sex with unfamiliar partner	(0 = never, 1 = 1–2 times, 2 = 3–5 times, 3 = 6–9 times, 4 = more than 9 times)	.82	1.03	0–4
Sex without condom	(0 = never, 1 = 1–2 times, 2 = 3–5 times, 3 = 6–9 times, 4 = more than 9 times)	2.66	1.49	0–4
Sex without any contraception	(0 = never, 1 = 1–2 times, 2 = 3–5 times, 3 = 6–9 times, 4 = more than 9 times)	1.57	1.62	0–4
Number of sexual partners	(number of lifetime partners)	4.67	8.69	0–65
Pathological gambling	(0 = no gambling, 14 = problem gambling)	1.95	1.72	0–14
Academic dishonesty	(0 = never, 1 = 1–2 times, 2 = 3–5 times, 3 = 6–9 times, 4 = more than 9 times)	1.82	1.31	0–4
Thrill and adventure seeking (TAS)				
Experience	(0 = low sensation seeking...; 21 = high sensation seeking)	12.29	5.05	0–21
Intentions	(0 = low sensation seeking...; 15 = high sensation seeking)	5.47	3.41	0–15
Sex	(0 = female, 1 = male)	.366	.483	0–1
Race	(0 = white, 1 = nonwhite)	.114	.319	0–1
Age	(number of years)	20.47	3.05	18–37

n = 254.

contraception?; (3) How many times have you had sexual intercourse with someone you did not really know very well?; and (4) How many sexual partners have you had in your lifetime? These behaviors have been explicitly identified as risky (Hoyle et al. 2000). The response categories ranged from 0 ("never") to 4 ("more than 9 times") for the first three items¹. The question regarding the number of sexual partners was left open-ended for respondents to fill in the actual number (see Table 1).

Pathological Gambling

To measure pathological gambling, we used the 20-item South Oaks Gambling Screen (SOGS; Lesieur and Blume 1987), which is a valid scale for general population samples (Leisure and Blume 1987; Shaffer, Hall, Vander-Bilt 1997; Stinchfield 1998). The questions asked respondents about their gambling behaviors, which ranged from how they handled losing money from gambling to whom they may have borrowed money from in order to facilitate their gambling habit. Using the scoring technique outlined by Lesieur and Blume, a pathological gambling scale was created ($\alpha = .76$). Higher numbers indicate more of a problem with gambling, with scores of 3 to 4 indicative of a "problem gambler" and scores above 5 suggestive of a "probable pathological gambler." According to the parameters outlined by Lesieur and Blume, less than 6% of our sample fell into the pathological gambler category (see Table 1).

Academic Dishonesty

To assess academic dishonesty, we asked respondents how many times they had cheated on a school test. The response categories ranged from 0 ("never") to 4 ("more than 10 times"). (see Table 1). The mean was roughly 2, which indicated that the average number of times respondents have cheated on a test is between 3 and 5 times.

¹Participants who indicated they have never had sexual intercourse were coded as missing on questions pertaining to condom use, contraceptive use, and sex with an unfamiliar partner.

Thrill and Adventure Seeking

Based on Zuckerman's (1994) work, we developed an instrument to assess thrill and adventure seeking (TAS). The 21-item TAS scale (see Appendix A) contained a wide range of behaviors covering mild (e.g., playing contact sports) to extreme (e.g., skydiving) TAS. Moreover, we asked respondents to indicate if they actually engaged in these behaviors, as well as if they would like to engage in these behaviors. By assessing both actual experience and intentions, we were able to measure TAS among individuals regardless of whether or not they have had the opportunity to engage in them. Descriptive statistics are shown in Table 1 for both the TAS Experience scale ($\alpha = .75$) and TAS Intentions scale ($\alpha = .86$).

Controls

In order to ensure that any relationship between self-control and the outcomes was not spurious, we included several control variables in multivariate analyses. Specifically, we controlled for sex, race, and age (see Table 1).

RESULTS

Table 2 illustrates the bivariate relations among the study variables. Of particular interest are the numerous significant relationships between self-control and antisocial deviant (AD) and TAS behaviors. In fact, the only outcomes failing to reach statistical significance with self-control were sex without a condom, sex without any contraception, and number of sexual partners. Thus, self-control proved to be significantly related to a wide variety of AD and TAS behaviors at the bivariate level.

To test the effects of self-control on AD and TAS behaviors, while controlling for age, race, and sex, we employed ordinary least squares (OLS) regression models for each outcome variable. As seen in Table 3, self-control was significantly related to each of the four risky driving variables. The results indicated that self-control was significantly and negatively associated with driving above the speed limit, following vehicles too closely, driving without a seatbelt, and driving

TABLE 2 Zero-Order Correlations among Study Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Self-control															
2. Drive above speed limit	-.17*														
3. Follow vehicles closely	-.22*	.14*													
4. No seatbelt	-.23*	.04	.12												
5. Driving while drinking	-.25*	.06	.11	.41*											
6. Sex with unfamiliar partner	-.20*	.03	.03	.19*	.47*										
7. Sex without condom	-.09	-.06	.03	.14	.10	.21*									
8. Sex without any contraception	-.10	-.05	.06	.17*	.18*	.20*	.49*								
9. Number of sexual partners	-.10	-.01	-.00	.26*	.36*	.73*	.17*	.16*							

10. Pathological Gambling	-.30*	-.02	.06	.37*	.28*	.17*	.09	.15	.06
11. Number of times cheated	-.33*	.04	.15*	.24*	.19*	-.01	.04	.14	-.01
12. Sensation seeking experience	-.17*	.00	-.01	.01	.14*	.02	.11	.05	-.08
13. Sensation seeking intentions	-.18*	.01	.10	.18*	.27*	.10	.07	.15*	.05
14. Sex	-.17*	.08	-.09	.21*	.23*	.03	-.19*	.00	.03
15. Race	.00	-.00	-.11	.20*	.10	.19*	-.00	-.01	.44*
16. Age	.15*	.01	-.06	.07	.10	.19*	.19*	.19*	.25*
									.22*
									.05
									-.03
									-.06
									.19*
									.60*
									.15*
									.18*
									.12
									.01
									-.24*
									-.25*
									-.11
									-.03
									.17*

* $p < .05$.

TABLE 3 OLS Regression Models Examining the Effect of Self-Control on Antisocial Deviant and Thrill and Adventure Seeking Behaviors

	Self-control		Age		Race		Sex	
	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.
Antisocial Deviant Behaviors								
Risky driving								
Drive above speed limit	-.02*	.01	.01	.02	-.02	.19	.03	.13
Follow vehicles closely	-.02*	.01	-.01	.02	-.29	.18	-.22	.12
Drive without seatbelt	-.03*	.01	.04	.02	.78*	.23	.43*	.15
Driving while drinking	-.04*	.01	.07*	.03	.46	.30	.56*	.20
Risky sex								
Sex with unfamiliar partner	-.03*	.01	.07*	.02	.49*	.21	-.01	.16
Sex without condom	-.03*	.01	.11*	.03	-.18	.31	-.61*	.246
Sex without any contraception	-.03 ⁺	.01	.12*	.04	-.27	.35	-.06	.27
Number of sexual partners	-.14*	.06	.61*	.17	11.65*	1.66	.27	1.10
Pathological gambling	-.06*	.02	.07	.04	.53	.48	.32	.28
Academic dishonesty	-.04*	.01	-.08*	.03	.19	.26	.40*	.17
Thrill and Adventure Seeking Behaviors								
Experience	-.08*	.04	-.33*	.10	-3.07*	1.02	.92	.68
Intentions	-.07*	.03	-.01	.07	-2.50*	.69	.90*	.46

* $p < .05$; ⁺ $p < .10$.

while drinking. In other words, as self-control increased, the frequency of each of these risky driving behaviors decreased, regardless of age, race, or sex.

Table 3 also shows the effect of self-control on risky sexual behavior. Self-control was significantly and negatively associated with sex with an unfamiliar partner, consistent with the bivariate finding noted above. However, self-control also was significantly and negatively related to sex without a condom and number of sexual partners in the OLS models. Given that neither of these risky sex questions were associated with self-control at the bivariate level, the OLS findings suggest there is a fair degree of overlap between risky sexual behavior and demographics, with age demonstrating a consistently significant effect (see Tables 2 and 3). Additionally, sex without any form of contraception was marginally and negatively significant. Thus, individuals who are high in self-control engage in less risky sexual behavior. These findings are important in that they have not been examined in previous research, despite the fact that Gottfredson and Hirschi (1990) explicitly note individuals low in self-control are more likely to engage in risky sexual behavior.

The final two AD behaviors examined in the current study, pathological gambling and academic dishonesty, both demonstrated significant relationships with self-control. Pathological gambling was negatively related to self-control, as predicted, indicating that individuals high on self-control were less likely to evince signs of psychopathology related to their gambling. Like risky sex, this is a novel finding in the literature that has not heretofore been examined. Consistent with previous research, academic dishonesty was significantly and negatively related to self-control. It would seem that this latter relationship is quite robust in that it has been demonstrated repeatedly across samples and methodologies.

While we were interested in examining the relationships between self-control and specific forms of antisocial deviant behavior, we also were interested in whether self-control could predict socially acceptable risky forms of behavior. Recall that we examined both actual TAS behavior as well as intentions to engage in these behaviors. As indicated in Table 3, self-control was significantly and negatively related to both forms of TAS behavior. Thus, individuals scoring

lower in self-control in our sample appear to have engaged in and have a proclivity for socially acceptable risky experiences.

Are Antisocial Deviant and Socially Accepted Risky Behaviors One in the Same?

The above analyses confirmed our hypotheses that self-control is related to both AD and TAS behaviors. While not explicitly discussed by Gottfredson and Hirschi (1990), this finding is consistent with their theory in that individuals with low self-control have a preference for thrilling and exciting experiences. Extrapolating this logic one step further, Gottfredson and Hirschi would likely suggest that the same individuals are engaging in both AD and TAS behaviors because the behavioral manifestations of self-control are general and not specific (i.e., there is no specialization). However, alternative theoretical perspectives would suggest that while AD and TAS behaviors might stem from the same source, it is unlikely that individuals would engage in both types of risky behavior (Farley 1981; Zuckerman 1994). This is an intriguing empirical question that has not been examined in previous research on self-control.

In an effort to address this question, we explored the relationship between AD and TAS behaviors. Table 4 illustrates that most (70%) of the zero-order correlations between AD and TAS behaviors are not significant, which suggests that individuals who are engaging in AD behaviors are not also engaging in TAS behaviors, nor do they have a desire to engage in them. However, to the extent that self-control is driving these significant findings, controlling for its effects should eliminate any significant relationships (Paternoster and Brame 1998). To test this, we computed partial correlation coefficients (see Table 4)². The results failed to support this interpretation in that none of the significant relationships (except academic dishonesty and TAS experience) were rendered nonsignificant. In fact, additional significant relationships emerged once the effects of self-control were partialled out (i.e., sex with an unfamiliar partner and TASI, $p < .10$; sex without a condom and TASE, $p < .05$; number

²In addition to self-control, we also controlled for the effects of sex, race, and age.

TABLE 4 Zero-Order and Partial Correlation Coefficients for Antisocial Deviant Behaviors and Socially Accepted Risky Behavior

	Zero-order		Partial	
	TASE	TASI	TASE	TASI
Driving above the speed limit	.00	.01	-.03	-.03
Follows vehicles too closely	-.01	.10	-.07	.05
No seatbelt	.00	.18*	.01	.19*
Drunk driving	.14*	.27*	.14*	.26*
Sex with unfamiliar partner	.02	.10	.08	.14 ⁺
Sex without condom	.11	.07	.19*	.10
Sex without any contraception	.04	.15*	.08	.15*
Number of sexual partners	-.08	.05	.06	.18*
Pathological gambling	-.06	-.03	-.08	-.07
Academic dishonesty	.19*	.22*	.10	.15*

* $p < .05$; ⁺ $p < .10$.

Partial correlations controlled for self-control, sex, age, and race.

of sexual partners and TASI, $p < .05$). These findings are important for two reasons. First, it appears that something other than self-control is driving the relationship between AD and TAS behaviors. Secondly, and perhaps more importantly, these analyses suggest that low self-control is manifested as antisocial deviance among some individuals, while in others it leads to socially accepted risky behaviors. We discuss these findings in greater detail in the following section.

CONCLUSIONS

Consistent with our hypotheses, self-control was significantly related to a wide range of antisocial deviant (AD) behaviors. Self-control has been found in previous studies to be significantly related to risky driving (Hartos et al. 2000; Keane et al. 1993; Piquero and Tibbetts 1996) and academic dishonesty (Arneklev et al. 1998; Cochran et al. 1994; Cochran et al. 1998; Gibbs and Giever 1995; Gibbs et al. 1998). Our replication of those findings provides further support for those relationships. Additionally, we found that individuals lower in self-control were more likely to engage in risky

sex³ and pathological gambling, neither of which have been specifically examined in previous research. These findings suggest that self-control is related to a wider range of AD behaviors than has been examined in previous research, broadening the scope of the general theory.

Many previous studies have examined the relationships between self-control and AD behaviors with the use of indices. This left unresolved the question of whether self-control was significantly related to specific AD behaviors. Our findings that specific relationships were observed leads us to conclude that if the goal is to understand the effect of self-control on deviant behavior in general, using indices or scales can accomplish this without substantial risk of including nonsignificant deviant behaviors. Our analyses, along with previous research, suggests that self-control can predict a wide range of AD behaviors, thereby reducing the possibility that deviance scales will include behaviors for which self-control is not related.

Perhaps the most theoretically and empirically interesting findings derived from our analyses involve socially accepted risky behavior. We found self-control to be significantly related to thrill and adventure seeking (TAS) behavior, and to our knowledge we are the first to demonstrate such a relationship. This is important because it suggests self-control is not only related to risky behaviors that are antisocial, but those that socially accepted as well. Thus, the scope of the general theory is applicable to a broader set of risky behaviors than has been previously noted. Additionally, this has implications for deviance research in general. Deviance researchers should theoretically integrate and empirically investigate notions of behavior that are atypical, yet do not violate social norms, in an effort to clarify how, if at all, phenotypically diverse behaviors are related, and whether an underlying factor can explain their association.

Our analyses offer some guidance in these respects. We failed to find a robust association between AD and TAS behaviors. While we offered no strong hypothesis with regard to this association, we did anticipate more of a relationship than we found. Despite the fact that these behaviors have varying degrees of social acceptance, both

³Self-control was only marginally related to sex without any form of contraception.

share the common element of risk. Moreover, Gottfredson and Hirschi (1990) would likely suggest the two sets of risky behaviors should covary because individuals who engage in one type of risky behavior are likely to engage in numerous other types as well (i.e., no specialization). Finally, both AD and TAS behaviors appear to have a common etiology—self-control. Yet, we failed to find strong empirical support for an association between AD and TAS behaviors in spite of a sound theoretical basis for anticipating such a relationship.

While the majority of relationships between AD and TAS behaviors were nonsignificant, there were some exceptions to this pattern. According to the general theory (Gottfredson and Hirschi 1990), these relationships should be rendered nonsignificant once their common source of self-control is statistically removed (cf. Britt 2000). Again, we could not empirically validate this theoretical prediction. However, this is consistent with Paternoster and Brame's (1998) finding that the significant relationship between crime and analogous behaviors remained after controlling for self-control. Our data cannot provide a definitive explanation of what other factors might be driving the (few) significant relationships between AD and TAS behaviors except to say that sex, race, and age are not responsible as we controlled for their effects.

The unexpected findings that self-control can eventuate in *either* antisocial deviance *or* socially accepted risky behaviors, *but not both*, hold theoretical importance. This possesses substantive meaning in that self-control will not inevitably lead to antisocial behavior, and, in fact, that it can manifest itself in socially acceptable ways. Gottfredson and Hirschi (1990) do not discuss such a possibility in their theory. However, both Zuckerman (1994) and Farley (1981) explicitly make such a prediction in their bio-social models of sensation seeking. Perhaps greater theoretical insight could be gained by exploring how self-control behaves in a fashion similar to sensation seeking and by examining how unique these constructs are.

The logical question emerging from this finding is what factors shape or direct low self-control into the different outcomes. The role of opportunity, while not elaborated upon substantially within the general theory (Burton et al. 1998; Cochran et al. 1998), might play an important function in the behavioral manifestation of self-control. Gottfredson

and Hirschi (1990) suggest that opportunity must be present for a crime to be committed. It would seem that the same presuppositions are entailed for thrill and adventure seeking as well. Farley (1981) suggests that opportunities for sensation seekers from more financially privileged backgrounds might differ markedly from those from more impoverished environments. There are certainly financial costs associated with several of the thrill and adventure seeking behaviors we examined (e.g., skydiving, racing cars), perhaps limiting access to these socially acceptable risky behaviors. Moreover, opportunities also might be limited based on geographic location. For example, rock climbing and water skiing require specific environs that might be unavailable to some individuals.

In an effort to circumvent the possibility that some individuals might not have had the opportunity to engage in thrill and adventure seeking behaviors, we included a measure of intentions to engage in thrill and adventure seeking (i.e., TASI). Nonetheless, only 40% of the zero-order correlations between the AD and TASI behaviors were significant. Thus, our data do not provide overwhelming evidence that lack of opportunity can fully explain this null finding. At the same time, this operationalization of opportunity is admittedly elementary. Drawing upon more advanced models of opportunity (e.g., Wilcox, Land, and Hunt 2003) might reveal why an underlying deficit in self-control can have such divergent manifestations.

Existing social psychological theories within criminology also might elucidate the factors affecting the divergent behavioral pathways among individuals low in self-control. For example, numerous extant empirical accounts have identified the salient role of peers in influencing behavior, especially antisocial behavior (Akers 1998; Sutherland 1947; Warr 2002). Perhaps individuals low in self-control who also affiliate with antisocial peers are more likely to pursue antisocial outlets. Additionally, individuals with strong bonds to conventional society have a more vested interest in not engaging in antisocial behaviors, and their stakes in conformity might inhibit antisocial behavior (Hirschi 1969; Sampson and Laub 1993). There is some evidence to support these notions. Wright, Caspi, Moffitt, and Silva (2001) found that criminogenic social ties (e.g., association with antisocial

peers) have a more pronounced effect on individuals low in self-control. Additionally, the effects of low self-control on antisocial behavior are tempered when there are prosocial attachments in one's life (e.g., strong familial and school attachments). Thus, the expression of low self-control might differ among individuals based on their social ties.

Our findings generate more questions than answers, providing several avenues of empirical investigation for future studies. Specifically, there needs to be more exploration of the relationship between AD and TAS behaviors in an effort to delineate whether these behaviors are fundamentally different from one another. There also is a need to probe why some individuals low in self-control engage in antisocial behavior, while other like individuals find more socially acceptable outlets. To the extent such factors can be identified, it might lead to important preventions and interventions that reduce the antisocial expressions of low self-control. This would hold great importance given that self-control is formed in childhood and remains stable thereafter (Arneklev et al. 1998; Gottfredson and Hirschi 1990).

Future research also should seek to replicate our findings using different samples. Several other studies exploring the effects of self-control on crime and analogous behaviors have used college samples and found them to be acceptable and even advantageous (Arneklev et al. 1998; Cochran et al. 1998; Gibbs and Giever 1995; Gibbs et al. 1998; Tibbetts and Myers 1999). Like those studies, we agree that the advantages of utilizing a college sample in our analysis outweighed the potential shortcomings. To the extent self-control among college students differs from that of the general population, it is more likely they possess greater rather than lesser self-control, which provides a more conservative test of the effects of self-control. Nonetheless, more representative samples would provide additional support for our conclusions.

Despite the limitations in our study, we have provided evidence that self-control is related to a wide variety of specific antisocial deviant behaviors, as well as socially accepted risky behaviors. This offers support for Gottfredson and Hirschi's (1990) generality hypothesis. At the same time, some of our findings call into question specific aspects of this hypothesis. Addressing these issues in greater detail will

likely lead to refinements of the general theory, which can serve to not only propel more informed research, but also advance the field of deviance as well.

APPENDIX A

The Thrill and Adventure Seeking (TAS) items are listed below. Participants were asked if they had ever engaged in any of the following behaviors (TAS experience), or whether they would like to engage in them (TAS intentions). All responses were either "yes" (1) or "no" (0).

Skydiving/parachuting

Motorcycle riding

Playing body contact sports (boxing, karate, football, rugby, etc.)

Skateboarding

Snowboarding

BMX riding

Motocrossing

Bungee jumping

Whitewater rafting/kayaking

Going to a rave

Mountain biking

Surfing

Wind surfing

In-line skating

Water skiing

Snow skiing

Mountain/rock climbing

Sandboarding

Sky surfing

Road cycling

Racing cars

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