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Does victimization reduce self-control? A longitudinal analysis ☆

Robert Agnew [a,*], Heather Scheuerman [b], Jessica Grosholz [b], Deena Isom [b], Lesley Watson [b], Sherod Thaxton [c]

[a] Department of Sociology, Tarbutton Hall, 1555 Dickey Drive, Emory University, Atlanta, Georgia 30322, United States
[b] Department of Sociology, Emory University, Atlanta, Georgia 30322, United States
[c] Office of the Federal Defender for the Eastern District of California, United States

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ABSTRACT

Purpose: To examine the effect of victimization on self-control.
Method: Five waves of data from the GREAT survey are analyzed; the effect of prior victimization on subsequent self-control is estimated using the dynamic panel generalized-method of moments.
Results: Victimization reduces subsequent self-control in the near term.
Conclusions: The findings point to another source of low self-control, help to explain why prior victimization is linked to subsequent victimization, and provide support for general strain theory – which predicts that strains such as victimization will reduce self-control.

Introduction

There is now little doubt that low self-control is a major cause of crime (Goode, 2008; Pratt & Cullen, 2000). Recent research suggests that it may also be an important predictor of victimization (Childs, Cochran, & Gibson, 2009; Higgins, Jennings, Tewksbury, & Gibson, 2009; Nofziger, 2009; Piquero, MacDonald, Dobrin, Daigle, & Cullen 2005; Schreck 1999; Schreck, Stewart, & Fisher 2006; Stewart, Elifson, & Sterk 2004; Sullivan, Farrell, Kliewer, Vulin-Reynolds, & Valois 2007). This is not surprising when one considers the traits that comprise low self-control, such as impulsivity, an attraction to risky activities, and irritability (see Gottfredson and Hirschi, 1990; Grasmick et al., 1993). Individuals with these traits are more likely to provoke others, fail to take precautions, and frequent dangerous places. The research on self-control and victimization, however, has generally failed to consider the possibility that victimization may reduce self-control. This is the case even though such an effect is predicted by general strain theory (Agnew, 1995, 2006; also see Colvin, 2000). Strains such as victimization are said to at least temporarily reduce the ability of people to manage their desires and emotions – thus reducing self-control.

It is important to examine the effect of victimization on self-control for several reasons. Doing so will help to clarify the relationship between these variables. In particular, certain prior research may have exaggerated the effect of self-control on victimization since it failed to consider the possibility that victimization also affects self-control. Examining the effect of victimization may also point to another source of low self-control. While researchers have found that self-control is influenced by several factors, it is still the case that most of the variance in self-control remains unexplained (e.g. Cauffman, Steinberg, & Piquero 2005; Goode, 2008; Latimore, Tittle, & Grasmick, 2006; Meldrum, 2008; Pratt & Cullen, 2000; Teasdale & Silver, 2009). Further, examining this effect may shed light on a central issue in the victimization research: the explanation of why prior victimization increases the likelihood of subsequent victimization (see especially Ousey, Wilcox, & Brummel, 2008; Ruback & Thompson, 2001). If victimization reduces self-control, this suggests that at least some crime victims develop traits that increase the likelihood of further victimization. Finally, examining the effect of victimization allows us to test a key argument in general strain theory: strains of a certain type – such as victimization – reduce levels of self-control.

This paper examines the effect of victimization on self-control using five waves of panel data from the Gang Resistance Education and Training (GREAT) evaluation survey. This effect is estimated using the dynamic panel generalized-method of moments (GMM) framework (see Arellano-Bover, 1995; Blundell-Bond, 1998; Ousey, Wilcox, & Brummel, 2008). This method is especially well suited for analyzing the type of panel data we employ, avoiding certain of the potential biases associated with both fixed- and random-effects models. We next (1) provide a brief overview of self-control theory; (2) review the research on self-control and victimization; (3) argue that victimization reduces self-control, drawing primarily on general strain theory; and (4) describe our test of this argument.

Theoretical and empirical background

Self-control theory

Self-control theory assumes that people are naturally inclined to satisfy their needs and desires in the most expedient manner possible,

☆ Note: The middle four authors should be viewed as equal contributors to the paper.
* Corresponding author. Tel.: +1 2404 727 7502; fax: +1 404 727 7532 (office).
E-mail address: bagnew@emory.edu (R. Agnew).

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including crime. People must learn to exercise self-control, and this learning is said to occur in the early family environment. Parents teach their children to exercise self-control by monitoring their behavior and consistently sanctioning deviance. An individual's level of self-control is said to be established by age seven or eight and to be relatively stable for the remainder of his or her life, although, absolute levels of self-control may increase as individuals transition into adulthood (Gottfredson & Hirschi, 1990). Not all individuals are taught to exercise high levels of self-control, however. Those low in self-control have several specific traits; most notably, they are impulsive, attracted to risky activities, self-centered, and irritable (Gottfredson & Hirschi, 1990).

While research has generally been supportive of Gottfredson and Hirschi's theory, certain of their arguments have been challenged. Parenting practices only explain a modest portion of the variance in self-control (e.g., Burt, Simons, & Simons, 2006; Hay, 2001; Hay & Forrest, 2006; Perrone, Sullivan, Pratt, & Margaryan, 2004; Pratt & Cullen 2000; Pratt, Turner & Piquero, 2004). In addition, other factors also affect variation in self-control. These include biological factors (Beaver, Wright & Delisi, 2007), school attachment (Burt et al., 2006; Meldrum, 2008), association with delinquent peers (Burt et al., 2006; Chapple, 2005; Hay & Forrest. 2008; Meldrum, 2008), and neighborhood factors (Pratt et al., 2004; Teasdale & Silver, 2009). Further, studies show that there is moderate variation in both relative and absolute levels of self-control after childhood (e.g., Hay & Forrest, 2006; Hay, Meldrum, Forrest & Ciarvolo, 2010; Turner & Piquero, 2002; Winfree, Taylor, He, & Esbensen, 2006). Related to this, there is evidence that self-control may also vary over the short-term – including weekly, daily, and situational variations (Baumeister, Vohs, & Tice, 2007; Horney, 2006; Muraven, Pogarsky, & Shmueli, 2006). Self-control, therefore, appears to be both a "trait" and a "state" variable. That is, individuals have a baseline level of self-control, which is relatively stable over long periods (self-control as a "trait"); but levels of self-control may sometimes vary around this baseline for short periods (self-control as a "state").

The effect of self-control on victimization

Researchers have recently begun to explore the effect of self-control on factors other than crime and analogous behaviors, with much attention focusing on the effect of self-control on victimization. There is good reason to believe that low self-control increases victimization. Individuals low in self-control are more likely to provoke others, with such provocations including criminal acts; and they are more likely to find themselves in risky circumstances, including those where capable guardians are absent and criminals are present (e.g., Childs et al., 2009; Nofziger, 2009; Schreck, 1999; Schreck et al., 2006). Reflecting these facts, several cross-sectional studies find that self-control has a relatively strong association with victimization (Childs et al., 2009; Kerley et al., 2008; Schreck, 1999; Schreck et al., 2002; Stewart et al., 2004; Childs et al., 2009). These studies examine a range of samples, including middle and high school students, college students, and adults. They find that the association holds even after factors such as personal criminal involvement, delinquent peer association, social control, and routine activities are controlled. But as Stewart et al. (2004, p.178) note, cross-sectional studies are "unable to determine whether low self-control causes victimization, whether victimization leads to low self-control, or whether they are reciprocal."

Longitudinal studies better address issues of causal order, and several recent studies find that prior self-control affects subsequent victimization. In a study of paroled youth conducted over a five-year period, Piquero and colleagues (2005) find that low self-control is a significant predictor of both violent victimization and violent offending. Both Schreck et al. (2006) and Higgins et al. (2009) use the GREAT data to examine the effect of self-control on subsequent victimization. Schreck and colleagues (2006) find that low self-control at Time 1 has a significant, positive relationship with victimization at Time 3, even when controlling for Time 1 victimization and Time 2 delinquency, delinquent peers, parental attachment, and school attachment. Higgins et al. (2009) find that individuals who were on a trajectory of low self-control were more likely to be victimized than those on a high self-control trajectory. None of these studies, however, examine the effect of victimization on self-control.

The effect of victimization on self-control

General strain theory (GST) posits that strains such as victimization increase the likelihood of crime *partly* because they reduce self-control (Agnew, 1995, 2006; Agnew et al., 2002; also see Baron, 2004; Colvin, 2000; Hay & Evans, 2006; Hay & Forrest, 2006). Strains refer to "events and conditions that are disliked by individuals," and victimization is identified as a type of strain especially likely to increase crime (Agnew, 2006, pp. 4, 73–74). This is because victimization is likely to be seen as unjust and is high in magnitude, posing a major threat to the physical and mental well-being of individuals. As a result, victimization is especially conducive to negative emotions, particularly anger. Anger creates a strong desire for revenge; reduces the awareness of and concern for the costs of possible actions, including crime; and lowers tolerance for further strains (Agnew, 1995, 2006; see Colvin, 2000 for a similar set of arguments). Consequently, a strain such as victimization contributes to many of the traits which comprise low self-control, such as impulsivity, risk-taking, and irritability. These effects are relatively contemporaneous. Strains affect levels of self-control in the near term, but not levels several weeks or months into the future -- when levels of anger have subsided. However, the experience of chronic or ongoing strain may result in a long-term reduction in self control (Agnew, 2006; also see Hitlin & Long, 2009, p. 148).

The idea that strains such as victimization reduce self-control has not yet been subject to much quantitative evaluation, although it finds some support in certain ethnographic research. For example, Anderson (1999) notes that people in poor, inner-city communities are regularly exposed to a range of stressors, including threatened and actual victimization, and so develop a "short fuse." That is, they become quick to anger and violence when provoked. The proposition that strain reduces self-control is also compatible with the psychological research on self-control depletion. Self-control is said to be analogous to a muscle which may tire from repeated use. The experience of strain elicits the exercise of self-control, as individuals seek to control their emotions and actions, and so strain should reduce subsequent levels of self control in the near term. This idea has received empirical support in a series of studies that require individuals to exercise self-control, then examine the effect of such exercise on their subsequent ability to exert self-control when tempted or provoked (see Baumeister, Vohs, & Tice, 2007; Muraven, Pogarsky, & Schmueli, 2006; Tice et al., 2007; Gailliot et al., 2008). For example, an experimental study by Muraven, Pogarsky, &. Shmueli (2006) found that students who had their self-control depleted were subsequently more likely to take advantage of opportunities to cheat.

In sum, there is good reason to believe that victimization will reduce subsequent levels of self-control in the near term. We next conduct a longitudinal test of this hypothesis, examining whether victimization has a relatively contemporaneous effect on self-control.

Data and methods

Data

We employ survey data from the five waves of the Gang Resistance Education and Training (GREAT) program assessment, conducted between 1995–1999.[1] Data were collected in the Spring of 1995 and

annually in the Autumn thereafter. The sample includes six cities – Las Cruces (NM); Lincoln (NE); Omaha (NE); Phoenix (AZ); Philadelphia, (PA); and Portland, (OR). These cities were selected because of the presence of viable GREAT programs and geographically diverse locations. While the sample is from a varied collection of places, it is not nationally representative (Esbensen, 2003; Schreck et al., 2006). Data collected in 1995 sampled a total of 3,568 sixth and seventh grade students attending 22 different schools. Response rates for each wave of data collection were 87%, 86%, 76%, 69%, and 67% respectively (Esbensen, 2003). A total of 839 students were present in all five waves of data. Although rates of attrition were relatively stable across most sites, Philadelphia had a considerably lower retention rate – likely reflecting the higher percentage of lower-socioeconomic status African American respondents in that city (Esbensen et al., 2001). An examination of attrition indicates that those with higher levels of victimization and lower levels of control were more likely to be lost (also see Watkins & Melde, 2007). This likely makes our test of the hypothesis a conservative one, since variation in both victimization and self-control is limited.

In an attempt to address potential bias resulting from the loss of respondents through attrition, missing data were imputed using the sequential regression approach available in *Stata* (StataCorp, 2009).[2] Five imputations were created for the dynamic panel analysis. The results from the imputed and non-imputed data were similar; therefore the analyses presented in the next section are based on the sample of 839 respondents and 3,356 "person-years."[3] This sample was obtained through case-wise deletion and reflects individuals who are present in all five panels of data. The sample analyzed is 44.7% male and 55.3% female; and 60.91% white, 11.68% African-American, 18.0% Hispanic, 9.42% other. The ages of the respondents at Wave 1 range from 10 to 14 years, with a mean of 12.09 (SD = .561).

Measures

Low self-Control

Consistent with Grasmick et al. (1993), self-control was measured by an eight-item scale assessing risk seeking and impulsive behaviors and attitudes. Impulsivity was measured with the following items: (1) "I act on the spur of the moment;" (2) "I do what brings me pleasure now;" (3) "I am more concerned with the short run;" and (4) "I spend no effort preparing for the future." These additional items gauged risk seeking: (1) "I take risks for fun;" (2) "I believe it is exciting to do things that can possibly get me in trouble;" (3) "I believe that excitement is more important than security;" and (4) "I test myself by doing something risky." The response categories range from strongly disagree (1) to strongly agree (5). Responses were summed, and scores ranged from 8 to 39, with high scores indicating lower levels of self-control (Wave 1 mean = 22.78, SD = 5.38, $\alpha = 0.83$). Even though the data preclude us from using the full Grasmick et al. (1993) scale—excluding the dimensions of simple tasks, physical activity, self-centered, and temper—other studies using this measure find that it is significantly related to criminal and analogous behaviors (Childs et al., 2009; Evans et al., 1997; Forde & Kennedy, 1997; Schreck, 1999; Schreck et al., 2006). Moreover, Pratt and Cullen's (2000) meta-analysis revealed that a variety of self-control measures similarly predict crime, including measures comparable to the one we use.

Victimization

A four-item scale measures how many times individuals were victimized over the past 12 months for the first wave and over the past 6 months for subsequent waves. The scale measures how many times individuals: (1) "were hit by someone trying to hurt them;" (2) "had someone use a weapon or force to get money or things from them;" (3) "were attacked by someone with a weapon or by someone trying to seriously hurt or kill them;" or (4) "had some of their things stolen from them." Each of the four items was recoded to correct for skewness, with responses greater than 12 coded to 12, and items were then summed to create the victimization scale (wave 1 mean = 3.16, SD = 4.38; $\alpha = 0.51$). Fifty-five percent of the respondents were victimized at least once during the study period, while 28% were victimized three or more times, and 4% twelve or more times.

Control variables

We control for five variables known to have an effect on self-control and victimization: parental attachment, parental monitoring, school attachment, delinquent peer association, and neighborhood disorder (see Meldrum, 2008; Pratt & Cullen, 2000; Teasdale & Silver, 2009). Parental attachment was measured by a twelve-item scale, with each item ranging from 1 to 7. Respondents with high levels of parental attachment indicate that they can talk to their parents, their parents trust and understand them, they ask their parents for advice, and they are praised when they do well (Wave 1 mean = 62.12; SD = 12.7; $\alpha = 0.88$). Parental monitoring was measured with a four-item scale, with each item ranging from (1) strongly disagree to (5) strongly agree. High scorers indicate that their parents know all of their friends, know where they are, and know who they are with when they are not at home or at school. Also, high scorers know how to contact their parents if they are not at home (Wave 1 mean = 15.74; SD = 2.91; $\alpha = 0.76$). A seven-item scale measures school attachment, with each item ranging from (1) strongly disagree to (5) strongly agree. Items were coded so that high scorers place much value on education, homework and grades (Wave 1 mean = 27.68; SD = 4.59; $\alpha = 0.81$). A 15-item scale measures delinquent peer association, with each item ranging from (1) none to (5) all of an individual's peers engaging in delinquent acts. High scorers state that most or all of their current friends engage in minor property and violent delinquency as well as drug use (Wave 1 mean = 20.98; SD = 7.86; $\alpha = 0.92$). A single indicator measures neighborhood safety around the respondent's school. High scorers report greater perceptions of safety (Wave 1 mean = 3.49; SD = 1.04).[4]

Table 1
Wave one correlations

	Low Self-Control	Victimization	Safe Neighborhood	Delinquent Peer Association	Parental Attachment	Parental Monitoring	School Attachment	Year
Low Self-Control	1.00							
Victimization	.162***	1.00						
Safe Neighborhood	-.067***	-.109***	1.00					
Delinquent Peer Association	.447***	.309***	-.084***	1.00				
Parental Attachment	-.299***	-.149***	.106***	-.320***	1.00			
Parental Monitoring	-.365***	-.155***	.120***	-.360***	.427***	1.00		
School Attachment	-.520***	-.148***	.059***	-.456***	.387***	.447***	1.00	
Year	-.090***	-.113***	.106***	.091***	-.097***	-.032*	-.111***	1.00
N = 839								

Method of analysis

The GREAT data are well suited for isolating the causal impact of victimization on self-control. At each of the five waves, respondents are asked about their current level of self-control and the victimizations they have experienced in the *previous* few months. This allows us to determine whether victimization has a relatively immediate effect on self-control, as predicted above. The temporal ordering of the variables is such that we can be reasonably certain that any effect of victimization on self-control is not biased by the effect of self-control on victimization. That is, we would not expect *contemporary* levels of self-control to affect *prior* victimization. Further, we include a lagged measure of self-control in the analysis, so that we can be sure that the effect of prior victimization on subsequent self-control is not due to the association between prior victimization and prior self-control.

We estimate the effect of victimization on self-control using a linear dynamic panel-data model that utilizes the generalized-method of moments (GMM) framework (see Arellano & Bover, 1995; Blundell & Bond, 1998; see Worrall, 2010 for an overview of panel data modeling). As discussed by Ousey et al. (2008), this method is well suited for the analysis of panel data such as ours—with a limited number of waves, but a large number of respondents. GMM incorporates many of the advantages of fixed and random effects models, while minimizing their disadvantages. In particular, in addition to properly handling large-*N*, small-*T* data, the GMM estimator appropriately addresses: (1) autocorrelation in the presence of a lagged dependent variable[5]; (2) endogenous "right-hand side" variables, and (3) unmeasured time-invariant person characteristics (Arellano & Bover, 1995; Blundell & Bond, 1998; Roodman, 2007). It is important to underscore that, by controlling for the effects of unmeasured time-stable characteristics, this approach ensures that any effect of victimization on self-control is not due to time-stable characteristics that we failed to consider. This also makes it unnecessary to control for such time stable variables as gender and race/ethnicity in the analysis.

Results

Correlations

Table 1 shows the Wave 1 correlations between self-control, victimization, parental attachment, parental monitoring, delinquent peers, school attachment, safe neighborhood, and year.[6] As expected, the table reveals that victimization is positively correlated with low self-control ($r = .162$; $p = .001$). The other correlations are also as expected. For example, low self-control is more common among those who associate with delinquent peers, are weakly attached to parents and school, and are poorly monitored by parents. Also, low self-control becomes less common as the youth in this study mature.

The dynamic panel analysis of the impact of victimization on low self-control

Table 2 shows the results from the dynamic panel regression of self-control on victimization, controlling for prior self-control, parental attachment, parental monitoring, delinquent peers, school attachment, and safe neighborhood.[7] The reported coefficients are standardized effects, and represent the marginal effects associated with a one standard-deviation change in the explanatory variable. As predicted, victimization increases low self-control ($\beta = .071$, $p = .001$). Association with school attachment decreases low self-control ($\beta = -.114$, $p = .001$). Parental attachment and monitoring do not significantly affect low self control. And prior low self-control is significantly related to subsequent low self-control ($\beta = .289$, $p = .001$).

Table 2
Dynamic panel regression of victimization on low self-control and other independent variables

Independent Variables	Non-Imputed Data β(S.E.)	Imputed Data β(S.E.)
Victimization	.071(.027)***	.091(.021)***
Lagged Self-Control	.289(.036)***	.233(.019)***
Parental Attachment	-.025(.033)	-.013(.021)
Parental Monitoring	-.016(.024)	-.022(.016)
Delinquent Peers	.046(.031)	.056(.015)***
School Attachment	-.114(.032)***	-.146(.018)***
Safe Neighborhood	-.013(.015)	-.016(.011)
N (observations)	3356	14272
N (Groups)	839	3568
Year Dummies	Y	Y
Wald χ^2	224.95***	
Sargan Test	65.02	
Hansen Test	68.10	

*$p<.05$, **$p<.01$, and ***$p<.001$.

Several points should be kept in mind when interpreting these results. The sample consists of adolescents, interviewed well beyond the point that parental socialization determines level of self-control according to Gottfredson and Hirschi. This fact may help explain why parental attachment and monitoring are unrelated to subsequent self-control, particularly given that prior self-control is held constant. It may also help explain why school attachment is related to self-control, since school is especially important in the lives of adolescents. Second, the analysis is explaining changes in levels of self-control over a period of several months; not base-line levels of self-control. As noted above, self-control does vary over the adolescent years, but the amount of variation is limited. This too may explain the small absolute size of the regression coefficients; there simply is not a lot of variation in self-control to explain. Finally, the method of analysis controls for all time-stable characteristics. As suggested above, self-control likely has two components: a baseline or "trait" level that is relatively stable and a "state" level that varies. GMM controls for the time-stable component of self-control, which likely explains why the effect of prior self-control on subsequent self-control is smaller than that found in other studies. And this also helps explain why the parent variables and delinquent peers do not affect self-control; such variables are related to baseline levels of self-control, as reflected in the correlation matrix, but not to changes in self-control during adolescence. The key point, however, is that victimization does contribute to low self-control. And while the effect of victimization is not large in absolute size, it is among the most important causes of variation in self-control during the adolescent years.

Alternative models testing for a lagged effect of victimization on self-control

As previously discussed, GST hypothesizes that the impact of victimization on self-control will be relatively contemporaneous. This assertion was empirically examined by analyzing alternative model specifications including a lagged victimization measure. Recall from the earlier discussion that the victimization measure inquires about a respondent's experience with contemporaneous victimization—that is, in the prior six months. The first alternative specification includes both a contemporaneous victimization measure and a lagged measure. In this model, contemporaneous victimization is statistically significant ($\beta = .078$, $p = .006$), but lagged victimization is not ($\beta = -.022$, $p = .381$). The second specification includes the lagged victimization measure, but not the contemporaneous measure, and also reveals no statistically significant effect for lagged victimization ($\beta = -.008$, $p = .75$). The alternative specifications provide strong

support for the contemporaneous, but not lagged, effect of victimization on self-control.[8]

Discussion and conclusions

Consistent with the predictions of GST, our study reveals that victimization reduces self-control in the near term. This is not to deny that self-control affects victimization. This study, in combination with the research cited above, suggests that victimization and self-control have a reciprocal relationship with one another. The effect of victimization on self-control, however, has generally been ignored in previous research. This effect is important for several reasons. It points to another source of low self-control, at least during the adolescent years. Previous research has focused on the effect of family factors on self-control, particularly parental attachment and discipline. And recent research has demonstrated that several other factors affect self-control, including school, peer, and neighborhood factors. We suggest that victimization can be added to this list of potential causes. This study also helps explain why prior victimization increases the likelihood of subsequent victimization, a central issue in the victimization literature. Victimization weakens self-control in the near term, thereby increasing the likelihood of further victimization. If subsequent research confirms this effect, those providing support services to victims should examine levels of self-control and take steps to enhance it where necessary. Finally, this effect supports a key prediction of general strain theory: strains, such as victimization, reduce self-control.

Researchers should build on this study by exploring the effect of victimization on self-control with additional samples, including nationally representative ones. They should also examine the effects of different types and levels of victimization on self-control; including violent versus property victimizations, serious versus minor victimizations, and isolated versus repeated victimizations. In addition, fuller measures of self-control should be employed; as indicated, we were only able to measure two key dimensions of self-control: impulsivity and risk-seeking. Further, research should better distinguish baseline or "trait" levels of self-control from short-term levels of self-control. This study focused on changes in self-control over a period of a few months, with baseline levels of self-control controlled. It is important to extend these findings and test the prediction that *chronic* strains can reduce baseline levels of self-control.

Research should also examine whether the effect of victimization on self-control is conditioned by certain factors, including those factors said to condition the effects of strains on crime (Agnew, 2006). For example, is victimization more likely to reduce self-control among those with poor coping skills and resources, few social supports, and criminal peers? Such research may of course suggest policy interventions to those working with crime victims. Finally, research should examine the effect of additional strains on self-control, including the many strains that Agnew (2001, 2006) links to crime. Research in these areas has the potential to shed new light on the causes of self-control, the causes and consequences of victimization, and the manner in which strain impacts crime. More generally, this research may help us better link those literatures dealing with victimization and the causes of crime; an important task given the extensive overlap between offenders and victims (e.g., Lauritsen, Sampson, & Laub, 1991; Jensen & Brownfield, 1986; Regoeczi, 2000; Singer, 1986).

Notes

1. We use the Spring 1995 pre-test instrument and the 1996–1999 instruments. We do not use the 1995 post-test questionnaire.

2. Specifically, *Stata* performs these imputations via chained equations (MICE). The more "technical" term is multiple imputation via a fully conditional specification. The FCS algorithm imputes the data on a variable-by-variable basis by specifying an imputation model for each variable, which is then used in the imputation of the next variable (i.e., "chained equations"). This process repeats—using a Gibbs sampling procedure to impute missing values—until convergence (Van Buuren et al., 2006).

3. Although the data contain five waves, the initial wave was excluded in order to estimate lagged effects ($839 \times 4 = 3{,}356$).

4. The specific items in these scales are available from the corresponding author on request. Also available are the descriptive statistics for all variables in the analysis at each of the five waves.

5. GMM minimizes bias in the estimated effect of the lagged dependent variable on the dependent variable (the effect of prior self-control on subsequent self-control in this study). Such bias is a serious concern in panel studies, since the error terms for the same variable measured over time are likely to be correlated.

6. Correlations are consistent across waves.

7. The Sargan ($\chi^2 = 65.02$, $p = 0.306$) and Hansen tests ($\chi^2 = 68.10$, $p = .221$) indicate that the instruments we use are truly exogenous. The Sargan test indicates that our instrumental variables are uncorrelated with the residuals, while the Hansen test indicates that our model is not over-identified (Ousey et al., 2008).

8. Sullivan et al. (2007) found that violent victimization did not have a significant lagged effect on self-restraint, a concept closely related to self-control. However, they did not test for a contemporaneous effect of victimization.

References

Agnew, R. (1995). The contribution of social-psychological strain theory to the explanation of crime and delinquency. In *The Legacy of Anomie Theory: Advances in Criminological Theory*. Vol. 6. eds F. Adler & W. S. Laufer. New Brunswick: Transaction Publishers.

Agnew, R. (2001). Building on the foundation of general strain theory: Specifying the types of strain most likely to lead to crime and delinquency. *Journal of Research in Crime and Delinquency*, *38*(4), 319−361.

Agnew, R. (2006). *Pressured into crime: An overview of general strain theory*. Los Angeles: Roxbury Publishing Company.

Agnew, R., Brezina, T., Wright, J. P., & Cullen, F. T. (2002). Strain, personality traits, and delinquency: Extending general strain theory. *Criminology*, *40*(1), 43−71.

Anderson, E. (1999). *Code of the street: Decency, violence, and the moral life of the inner city*. New York: W.W. Norton & Company.

Arellano, M., & Bover, O. (1995). Another look at the instrumental variables estimation of error-components models. *Journal of Econometrics*, *68*, 29−51.

Baron, S. W. (2004). General strain, street youth and crime: A test of Agnew's revised theory. *Criminology*, *42*(2), 457−483.

Baumeister, R. F., Vohs, K. D., & Tice, D. M. (2007). The strength model of self-control. *Current Directions in Psychological Science*, *16*(6), 351−355.

Beaver, K. M., Wright, J. P., & Delisi, M. (2007). Self-control as an executive function: Reformulating Gottfredson and Hirschi's parental socialization thesis. *Criminal Justice and Behavior*, *34*(10), 1345−1361.

Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, *87*, 11−143.

Burt, C. H., Simons, R. L., & Simons, L. G. (2006). A longitudinal test of the effects of parenting and the stability of self-control: Negative evidence for the general theory of crime. *Criminology*, *44*(2), 353−396.

Cauffman, E., Steinberg, L., & Piquero, A. R. (2005). Psychological, neuropsychological and physiological correlates of serious antisocial behavior in adolescence: The role of self-control. *Criminology*, *43*(1), 133−176.

Chapple, C. L. (2005). Self-control, peer relations, and delinquency. *Justice Quarterly*, *22*(1), 89−106.

Childs, K. K., Cochran, J. K., & Gibson, C. L. (2009). Self-control, gang membership, and victimization: An integrated approach. *Journal of Ctrime & Justice*, *32*(1), 35−60.

Colvin, M. (2000). *Crime & coercion: An integrated theory of chronic criminality*. New York: St. Martin's Press.

Esbensen, F. -A. (2003). Evaluation of the gang resistance education and training (GREAT) program in the United States, 1995–1999. In. Ann Arbor, MI: Inter-University Consortium for Political and Social Research.

Esbensen, F. -A., Osgood, D. W., Taylor, T. J., Peterson, D., & Freng, A. (2001). How great is G.R.E.A.T.? Results from a longitudinal quasi-experimental design. *Criminology & Public Policy*, *1*(1), 87−118.

Evans, T. D., Cullen, F. T., Burton, V. S., Jr., Dunaway, R. G., & Benson, M. L. (1997). Social consequences of self-sontrol: testing the general theory of crime. *Criminology*, *35*, 475−504.

Forde, D. R., & Kennedy, L. W. (1997). Risky lifestyles, routine activities, and the general theory of crime. *Justice Quarterly*, *14*, 265−294.

Gailliot, M. T., Mead, N. L., Baumeister, R. F., John, O. P., Robins, R. W., & Pervin, L. A. (2008). Self-regulation. In *Handbook of personality psychology: Theory and research* (3rd ed.). 472–491ff. New York, NY US: Guilford Press.

Goode, Erich (2008). *Out of control: Assessing the general theory of crime*. Stanford, CA: Stanford University Press.

Gottfredson, M. R., & Hirschi, T. (1990). *A general theory of crime*. Standford, California: Standford University Press.

Grasmick, H. G., Tittle, C. R., Robert, J., Bursik, J., & Arneklev, B. J. (1993). Testing the core empirical implications of Gottfredson and Hirschi's general theory of crime. *Journal of Research in Crime and Delinquency*, *30*(1), 5−29.

Hay, C. (2001). Parenting, low self-control, and delinquency: A test of self-control theory. *Criminology*, *39*, 707−736.

Hay, C., & Evans, M. M. (2006). Violent victimization and involvement in delinquency: Examining predictions from general strain theory. *Journal of Criminal Justice*, *34*, 261−274.

Hay, C., & Forrest, W. (2006). The development of self-control: Examining self-control theory's stability thesis. *Criminology*, *44*(4), 739−774.

Hay, C., & Forrest, W. (2008). Self-control theory and the concept of opportunity: The case for a more systematic union. *Criminology*, *46*(4), 1039−1072.

Hay, C., Meldrum, R., Forrest, W., & Ciarvolo, E. (2010). Stability and change in risk seeking: investigating the effects of an intervention program. *Youth Violence and Juvenile Justice*, *8*(2), 91—106.
Higgins, G. E., Jennings, W. G., Tewksbury, R., & Gibson, C. L. (2009). Exploring the link between low self-control and violent victimization trajectories in adolescents. *Criminal Justice and Behavior*, *36*(10), 1070—1084.
Hitlin, S., & Long, C. (2009). Agency as a sociological variable: A preliminary model of individuals, situations, and the life course. *Sociology Compass*, *3*(1), 137—160.
Horney, J. (2006). An alternative psychology of criminal behavior. *Criminology*, *44*(1), 1—16.
Jensen, G. F., & Brownfield, D. (1986). Gender, lifestyles, and victimization: Beyond routine activity. *Violence and Victims*, *1*(2), 85—99.
Kerley, K. R., Xu, X., & Sirisunyaluck, B. (2008). Self-control, intimate partner abuse, and intimate partner victimization: Testing the general theory of crime in Thailand. *Deviant Behavior*, *29*(6), 503—532.
Latimore, T. L., Tittle, C. R., & Grasmick, H. G. (2006). Childrearing, self-control, and crime: Additional evidence. *Sociological Inquiry*, *76*(3), 343—371.
Lauritsen, J. L., Sampson, R. J., & Laub, J. H. (1991). The link between offending and victimization among adolescents. *Criminology*, *29*(1), 265—292.
Meldrum, R. C. (2008). Beyond parenting: An examination of the etiology of self-control. *Journal of Criminal Justice*, *36*, 244—251.
Muraven, M., Pogarsky, G., & Shmueli, D. (2006). Self-control depletion and the general theory of crime. *Journal of Quantitative Criminology*, *22*, 263—277.
Nofziger, S. (2009). Victimization and the general theory of crime. *Violence and Victims*, *24*(3), 337—350.
Ousey, G. C., Wilcox, P., & Brummel, S. (2008). Déjà vu all over again: Investigating temporal continuity of adolescent victimization. *Journal of Quantitative Criminology*, *24*, 307—335.
Perrone, D., Sullivan, C. J., Pratt, T. C., & Margaryan, S. (2004). Parental efficacy, self-control, and delinquency: A test of a general theory of crime on a nationally representative aample of youth. *International Journal of Offender Therapy and Comparative Criminology*, *48*(3), 298—312.
Piquero, A. R., MacDonald, J., Dobrin, A., Daigle, L. E., & Cullen, F. T. (2005). Self-control, violent offending, and homicide victimization: Assessing the general theory of crime. *Journal of Quantitative Criminology*, *21*(1), 55—71.
Pratt, T. C., & Cullen, F. T. (2000). The empirical status of Gottfredson and Hirschi's general theory of crime: A meta-analysis. *Criminology*, *38*, 931—964.
Pratt, T. C., Turner, M. G., & Piquero, A. R. (2004). Parental socialization and community context: A longitudinal analysis of the structural sources of low self-control. *Journal of Research in Crime and Delinquency*, *41*(3), 219—243.
Regoeczi, W. C. (2000). Adolescent violent victimization and offending: Assessing the extent of the link. *Canadian Journal of Criminology*, *42*(4), 493—505.
Roodman, D. (2007). How to do xtabond2: An introduction to 'difference' and 'system' GMM in Stata. Washington, D.C.: Center for Global Development.
Ruback, R. B., & Thompson, M. R. (2001). *Social and psychological consequences of violent victimization.* Thousand Oaks, CA: Sage Publications, Inc.
Schreck, C. J. (1999). Victimization and low self-control: An extension and test of a general theory of crime. *Justice Quarterly*, *16*, 633—654.
Schreck, C. J., Stewart, E. A., & Fisher, B. S. (2006). Self-control, victimization, and their Influence on risky lifestyles: A longitudinal analysis using panel data. *Journal of Quantitative Criminology*, *22*, 319—340.
Schreck, C. J., Wright, R. A., & Miller, J. M. (2002). A study of individual and situational antecedence of violent victimization. *Justice Quarterly*, *19*(1), 159—180.
Singer, S. I. (1986). Victims of serious violence and their criminal behavior: Subcultural theory and beyond. *Violence and Victims*, *1*(1), 61—70.
StataCorp. (2009). *Multiple-Imputation Reference Manual.* College Station, TX: Stata Press.
Stewart, E. A., Elifson, K. W., & Sterk, C. E. (2004). Integrating the general theory of crime into an explanation of violent victimization among female offenders. *Justice Quarterly*, *21*, 159—181.
Sullivan, T. N., Farrell, A. D., Kliewer, W., Vulin-Reynolds, M., & Valois, R. F. (2007). Exposure to violence in early adolescense: The impact of self-restraint, witnessing violence, and victimization on aggression and drug use. *Journal of Early Adolescence*, *27*(3), 296—323.
Teasdale, B., & Silver, E. (2009). Neighborhoods and self-control: Toward an expanded view of socialization. *Social Problems*, *56*(1), 205—222.
Tice, D. M., Baumeister, R. F., Shmueli, D., & Muraven, M. (2007). Restoring the self: Positive affect helps improve self-regulatioon following ego depletion. *Journal of Experimental Social Psychology*, *43*, 379—384.
Turner, M. G., & Piquero, A. R. (2002). The stability of self-control. *Journal of Criminal Justice*, *30*, 457—471.
Van Buuren, S., Brand, J. P. L., Groothuis-Oudshoorn, & Rubin, J. D. (2006). Fully conditional specification in multivariate imputation. *Journal of Statistical Computation and Simulation*, *72*(12), 1049—1064.
Watkins, A. M., & Melde, C. (2007). The effect of self-control on unit and item nonresponse in an adolescent sample. *Journal of Research in Crime and Delinquency*, *44*(3), 267—294.
Winfree, L. T., Jr., Taylor, T. J., He, N., & Esbensen, F. A. (2006). Self-control and variability over time: Multivariate results using a 5-year, multisite panel of youths. *Crime & Delinquency*, *52*(2), 253—286.
Worrall, J. G. (2010). A user-friendly introduction to panel data modeling. *Journal of Criminal Justice Education*, *21*, 182—196.