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Self-control, Victimization, and their Influence on Risky Lifestyles: A Longitudinal Analysis Using Panel Data

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Abstract This research expands past investigations into the influence of low self-control as a risk factor for criminal victimization. Specifically, we consider two questions: (1) whether low self-control at one point in time can predict future victimization, and (2) whether victims alter lifestyle choices (like their own delinquency and contact with delinquent peers) in response to their earlier victimization. We answered these questions using three waves of adolescent panel data from the evaluation of the Gang Resistance Education and Training program. Our results support the predictions of self-control theory, showing that low self-control measured at an earlier time is associated with later victimization, even after controlling for past victimization, delinquency, social bonds, and delinquent peer contact. Likewise, self-control appears to influence the relationship between earlier victimization and later lifestyles.

Keywords Victimization · Lifestyles · Self-control · Panel design · Routine activities

Introduction

Victimization is not a random event. Studies spanning the past 25 years have consistently reported that certain lifestyles and contexts increase the chances of victimization (e.g., Fisher et al. 1998; Gover 2004; Hindelang et al. 1978; Miethe and Meier

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1994; Miethe et al. 1987; Mustaine and Tewksbury 1998; Schreck et al. 2004). Indeed, victim profiles share remarkable similarities with those of offenders, and research even finds that an individual's participation in crime is correlated to an impressive degree with that person's level of victimization (e.g., Lauritsen et al. 1991; Lauritsen et al. 1992; Mustaine and Tewksbury 1998; Woodward and Fergusson 2000). Researchers have further developed the implications of the victim-offender connection, finding that variables theoretically relevant to understanding the etiology of crime can successfully predict criminal victimization (e.g., Lauritsen et al. 1992). This, in turn, suggests that theories of offending could be useful staring points for understanding criminal victimization (Piquero and Hickman 2003; Schreck 1999).

The relatively recent emergence of ''new'' theories of victimization like Gottfredson and Hirschi's (1990) self-control theory and Charles Tittle's control balance theory (1993) offers wide scope for empirical study, as existing research has barely scratched the surface of potential topics for inquiry. The empirical findings have thus far been supportive that antecedents of crime further our understanding of crime victimization as well (Piquero and Hickman 2003; Schreck 1999; Schreck et al. 2002; Stewart et al. 2004). Nevertheless, with the exception of the recent work of Piquero and colleagues (2005), the research literature linking self-control with victimization has relied on cross-sectional data and hence, cannot address one necessary condition for establishing causal relationships: temporal ordering. The present study builds on the current victimization research by considering the longitudinal influence of theoretically relevant risk factors for victimization.

Besides introducing plausible new causal relationships with which to better understand victimization, the theories just mentioned also offer the advantage of proposing how the victims might behave in reaction to a victimization experience. The concept of low self-control, for instance, suggests that some individuals are habituated toward *not* thinking about later consequences. Therefore they may fail to connect their activities to victimization risk (or appreciate that connection), and continue to put themselves in the same situations and engage in the same behaviors that facilitated, provoked, or precipitated their earlier victimization. Existing research on the lifestyle decisions of crime victims employs a rational choice framework, which assumes that individuals make decisions based on the perceptions of advantages and costs (e.g., Cook, 1986; Dugan 1999; Garofalo 1981; Warr and Stafford 1983; Rountree and Land 1996). To the extent that individuals are not inclined to consider the costs of their actions, a pure rational choice approach may not accurately explain the decisions of victims to make, or elect not to make, changes that might reduce the risk of victimization.

The current study addresses two issues central to the understanding of the causal mechanisms underlying victimization. First, we extend previous studies that have examined self-control as a predictor of victimization, using the first three waves of the six-city Gang Resistance Education and Training (GREAT) data to determine whether self-control influences future victimization. The GREAT data allow us to include a temporal component to our models that earlier research lacked. Second, we test whether previous victimization has any effect on later delinquent activities and delinquent patterns, both measurers of greater exposure to offenders. We estimated latent measurement and structural equation models to rigorously test these hypothesized relationships. As a prelude to our empirical analysis, we review how self-control theory and lifestyle/routine activity theory provide explanations for victimization and discuss the empirical support for each theory.

Self-control and Routine Activities/Lifestyles Explanations of Victimization

Figure 1 graphically depicts the basic theoretical framework, which links self-control as well as lifestyle predictors of victimization (see Schreck et al. 2002; Stewart et al. 2004). In this framework, self-control is the central concept. Gottfredson and Hirschi (1990) formulated ''self-control theory,'' and defined low self-control as the tendency of some individuals to act as if long-term negative consequences did not exist. Their theory assumes that people have a natural tendency to make choices that lead to quick and certain pleasurable outcomes (i.e., hedonism); it is in fact one of the purposes of socialization to consider long-term consequences with respect to their personal well being, even when faced with the temptation for immediate advantage. Those who did not receive effective socialization and thus to acquire self-control tend to engage in crime and ''crime analogous'' behavior. That is, those who possess low self-control tend to be self-centered, belligerent, lazy, thrill seeking, impulsive, and oriented toward the ''here and now'' as opposed to anticipating future consequences. Low self-control frees the individual from the fear of the consequences of criminal and analogous behaviors, like heavy drinking, drug use, broken relationships, unstable work histories, and lack of educational achievement. While many other factors besides self-control may be responsible for these self-destructive outcomes, low self-control corresponds with the undesirable life circumstances just described (e.g., Evans et al. 1996; Forde and Kennedy 1997; Junger et al. 2001).

Gottfredson and Hirschi further noted that lasting individual differences in self-control form by mid childhood. Consequently, self-control measured at age 15 should predict criminal activity at age 15 and thereafter. Self-control theory has generated considerable research attention, and commentators reviewing the impressively large empirical work on the theory have concluded that self-control is an ''important'' variable in the study of criminal and delinquent behavior (for a more detailed summary of this literature, see Pratt and Cullen 2000).

The connection between self-control and victimization is a more recent development. Schreck (1999) posited that victimization was yet another ''crime-analogous'' outcome, asserting that individuals with low self-control would engage in behaviors that make them more attractive and ''easy'' targets. Victimization is, of course, an undesirable outcome in that it is unlikely to offer much advantage to the victim; however, the behaviors and events leading up to victimization frequently

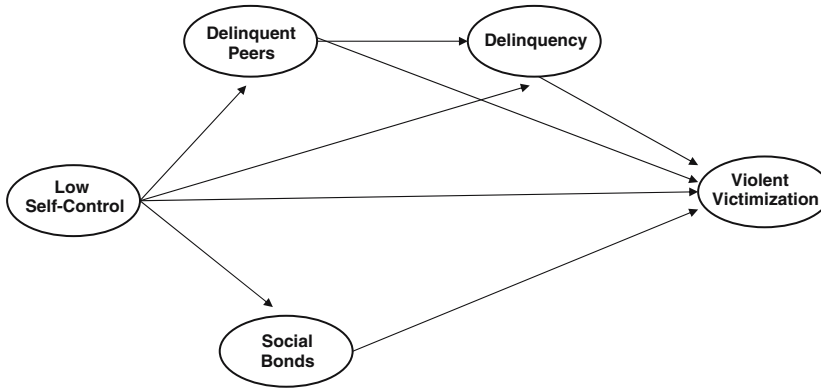

Fig. 1 Basic theoretical model

appear to be advantageous, at least in the short-run. Selfishness and belligerence—which are two personality manifestations of low self-control—easily lead to grievances with others, which is the primary reason why assaults and homicides occur (Tedeschi and Felson 1994). The unwillingness to plan ahead coupled with impulsivity have clear implications for victimization, as one can reasonably infer that much individual victimization prevention (e.g., carrying mace, locking doors) assumes that people can foresee themselves as possible victims and take steps to prevent that outcome. Implementing precautions against victimization also frequently requires effort: Even hiding valuables in one's car before quickly going into the grocery store entails thought and time, and thus some inconvenience, even if minor. The lack of diligence (i.e., laziness) therefore makes taking precautions at least somewhat unattractive in the short-term. Although victimization may sometimes happen anyway to those who diligently take precautions and who cause others to have no grievances against them, low self-control clearly has implications for transforming individuals into worthwhile and poorly defended targets for crime. Moreover, the stability in self-control thesis that Gottfredson and Hirschi (1990) advanced suggests that self-control, once formed, could be an enduring predictor of victimization throughout an individual's lifetime. Low self-control identified at one time point should not only correspond with high levels of contemporaneous victimization, but relatively high levels of future victimization as well.

A small but growing body of empirical research suggests that there is merit in linking self-control with victimization. Using a convenience sample of college students, Schreck (1999) found that low self-control increased the odds of becoming a crime victim. A later study employed a broader theoretical perspective in addition to a measure of self-control, albeit with a convenience sample of high school students (Schreck et al. 2002). In this research self-control remained a significant predictor of violent victimization even after controlling for exposure to motivated offenders (i.e., the presence of close friends who have been arrested), social bonds, and unmonitored and unstructured leisure activity with peers. The findings suggest that adolescents with low self-control create danger for themselves: They seem to gravitate toward the company of motivated offenders as well as into risky situations conducive to victimization. This latter finding makes sense especially when one considers that (1) conventional peers and informal authorities would likely make unwelcome attempts to regulate the behavior of those with low self-control, and (2) such regulation would be unlikely to happen in the company of other delinquents or in unsupervised and unmonitored situations (see Osgood et al. 1996). Building on Schreck's earlier work, Stewart and his colleagues (2004) reported that low self-control was linked to higher levels of victimization among a sample of African-American women even after controlling for a number of risky activities (e.g., drug use) and exposure to offenders. In short, while research on the relationship between self-control and victimization is still growing (yet scant), the findings to date are promising enough to invite further inquiry.

One limitation of the studies just mentioned is that they all relied on cross-sectional data, rendering them unable to address whether self-control measured at one time point is a significant predictor of victimization at later time points. This latter issue is particularly important, given what we know of crime victims from the repeat victimization literature. Pease and Laylock (1996), for example, noted that previous victimization is a good predictor of future victimization, and that the likelihood of future victimization increases with the incidence of previous victimization.

Wittebrood and Nieuwbeerta (2000) reported results similar to that of Pease and Laylock (though with cross-sectional data), and speculated the existence of ''state dependence'' with respect to victimization, where individuals who are victims of crime tend to remain victims. While this stability might be due to contextual or situational factors (see, for example, Osborn and Tseloni 1998), self-control theory asserts that stability in disadvantageous life outcomes is also a consequence of self-control. Indeed, Piquero et al. (2005) found that low self-control, measured using a behavioral index (which included such items as disciplinary infractions and overt aggressiveness), was connected to later homicide victimization. The work of Piquero and his colleagues is an important start with respect to understanding the long-term importance of low self-control as a source of victimization risk, but this is presently the only example of longitudinal work in the self-control/victimization literature.

Figure 1 also illustrates how lifestyle factors might independently determine whether victimization could occur. Routine activity theory posits that victimization occurs through the meeting, in time and space, of would-be offenders, worthwhile targets, and ineffective guardianship (Cohen and Felson 1979). At times, one may be exposed to potential offenders, or be vulnerable, or be a worthwhile target, but those situations where all three conditions are present have the greatest potential for predatory crime. Lifestyles theory, published before Cohen and Felson's work but later acknowledged as making claims consistent with routine activities theory (Hindelang et al. 1978; Garofalo 1987), implicitly argues that the consequence of these three conditions tends to occur more frequently among some groups than with others (namely, the young, males, and African-Americans). Thus, membership in a particular demographic group can create situations fraught with high victimization risk.

Specific lifestyles appear related to victimization. For example, several researchers have linked delinquent behavior with both personal and property victimization (e.g., Fisher et al. 1998; Jensen and Brownfield 1986; Lauritsen et al. 1991; Lauritsen et al. 1992; Mustaine and Tewksbury 1998). Delinquent behavior, including drug use, acts of violence, and alcohol use, appear related to victimization for several reasons. Criminal offending can place the offender at higher risk for retaliation at the hands of an angry former victim (e.g., Singer 1981). Felson (1998) noted that alcohol use gives people ''a big mouth and big ears''—that is, alcohol makes people more inclined to provoke victimization as well as to take quick offense. Excessive alcohol use can undermine effective guardianship, as self-protection is difficult if one's cognition and motor skills are impaired. These risky lifestyles, then, clearly have theoretical relevance for understanding victimization.

Researchers have also linked the delinquent peer context to victimization (e.g., Lauritsen et al. 1992; Schreck et al. 2002; Schreck and Fisher, 2004; Schreck et al. 2004). This connection is not surprising, as only a small percentage of personal crimes occur where offenders and victims are strangers (see Bureau of Justice Statistics, 2003). Lifestyle/routine activities theory suggests that the most convenient, visible, and accessible targets for crime are individuals with whom one spends time. One is likely to know about the valuables possessed by one's peers, as well as their routines and vulnerabilities. In this respect, it seems reasonable to expect that offenders will tend to victimize those they know. The work of Schreck and his colleagues (2002) showed that spending time with deviant peers elevates risk of victimization even after controlling for level of peer delinquency. Thus, having delinquent friends should place individuals in greater contact with motivated offenders.

Lifestyle Responses to Victimization

Rational Choice

Research into the behavioral consequences of victimization, such as avoiding certain places or moving to another residence, tends to assume a rational actor (see, for instance, Rountree and Land 1996). That is, individuals make decisions on friends and associates, which route to take to work or school, or where to live, based on which alternative would maximize advantage relative to costs. For example, consider the decision to associate with delinquent friends. Spending time with delinquents leads to certain advantages: companionship and excitement, among others. Costs might include a lowered reputation and greater (and unwelcome) scrutiny from authorities. According to the research, an additional cost of spending time with delinquent peers is victimization. While there is no guarantee that experiencing victimization will be sufficient to offset the advantages of associating with delinquent peers, the rational choice model would lead one to expect to see, on balance, a consistent tendency for erstwhile victims to shed their delinquent companions and associate with those who are less dangerous. The same would be true of other lifestyles connected to victimization, like committing crime, drinking large amounts of alcohol, and using drugs.[1] Victimization might contribute to desistance from these activities at least to the extent that victimization leads individuals to believe that the advantages are not worth the risk. Extensive research has found that previous victimization tends to be associated with constrained activities and precautionary measures (e.g., Dugan 1999, Keane 1998; Rountree and Land 1996; Skogan and Maxfield, 1981; Warr 1994). While there is empirical support for the idea that victims make decisions in response to victimization, we should also note that one can generally categorize the underlying theory in this literature as ''thin'' rational choice theory (see Hechter and Kanazawa 1997). That is, the basic conceptual framework traditionally used to explain individual responses to victimization is universalistic; differences in individual goals or preferences are assumed to either not exist or to be substantively unimportant.

Self-control

This assumption behind thin rational choice theories may be unrealistic, however, if people vary in how they perceive the negative consequences flowing from their behavior. Self-control theory resembles what Hechter and Kanazawa (1997) described as a ''thick model'' rational choice theory, where individuals differ in their ''motives'' and that in order to understand their behavior one must have knowledge of these motives. More specifically, quick and easy pleasure tends to motivate those with low self-control, whereas those with more self-control are to a greater degree motivated by a combination of fear of negative consequences as well as the anticipated rewards of pleasurable activity. A clear difference between self-control theory and thin rational choice models is the acknowledgement that lifestyle choices and

[1] There is some evidence suggesting that, at least for homeless and runaway youth, that drinking activity is associated with less victimization rather than more. Baron et al. (2001) speculated that this was because street people tend to be more judicious in locating a relatively inaccessible place to pass out after drinking.

victimization are to a significant degree driven by differences in individual preference functions.

To be more specific, consider the following. The notion of ''fool me once, shame on you; fool me twice, shame on me'' suggests that victims of crime would rationally reflect on their experiences and alter behaviors and circumstances that might have contributed to their risk of victimization. Someone who was victimized by strangers on the way home from a bar may elect to stay home more often, or drink less, or go with close friends or family. An individual victimized by his or her friends may choose to terminate the relationships with the current peer group and start anew. Such changes to one's lifestyle, in response to victimization, would be quite reasonable to a rational individual.

The seemingly perfectly rational responses to victimization just mentioned seem less certain, however, when we consider individual preferences as determined by self-control. First, it may be that the pains of victimization fail to outweigh the advantages of unstructured and unmonitored social activity with peers. Put differently, one may prefer activities with high risk of victimization because victimization may be a small price to pay for spending time with one's peers and doing what one pleases away from prying adult eyes. As we observed earlier, this appears to be the case among those with low self-control—one might expect that people possessing low self-control would tend to self-select into risky situations and friendships with delinquents (Gottfredson and Hirschi 1990; Schreck et al. 2002). Second, any meaningful change arising from a victimization incident assumes the willingness of the former victim to reflect and anticipate how his or her actions might have contributed to the risk of victimization. Since low self-control is the habit of not acting as if long-term risks mattered, such reflection appears exceedingly unlikely among those who lack self-control. Indeed, a central tenet of self-control theory is that there is considerable stability in the rank-ordering of people based on their criminality, and that little (besides age) would have any lasting effect on this. Third, Gottfredson and Hirschi (1990) indicated that people are likely to find those with low self-control to have objectionable personalities and behavioral tendencies. In this respect, conventional peers—who would be safer to hang out with (see Schreck et al. 2004)—might find those with low self-control disagreeable and would eventually reject them (a sentiment that would likely be mutual, as the person with low self-control would resent the ridicule of conventional peers, as well as find them too dull). Consequently, one could expect that people would find friends with similar interests and personalities, and those with low self-control would either consciously seek those like themselves or otherwise would be forced to. The theory thus would lead us to predict that the presence of low self-control in an individual would be associated with a lessened likelihood that one would make changes in lifestyles or friendships in response to victimization.

Summary of Research Objectives

This study investigates the connection between self-control and victimization, building from earlier work as well as improving the specification of the previously estimated models. As noted earlier, the existing self-control and victimization research relies on convenience samples or narrowly defined samples. The current research builds on this existing body of knowledge in two substantive ways. First, we examine the role of self-control at one point in time as a predictor of victimization at

a future point in time. Second, we test whether victimization is associated with subsequent changes in delinquent activity and friendship patterns. If self-control theory is supported, low self-control will (1) be a significant influence on victimization in the long-term, and (2) will moderate the likelihood that respondents will adjust their activities and friends after victimization.

Methods

This research uses the first three waves of panel data from the national evaluation of the Gang Resistance Education and Training (GREAT) program (1995–1999). Six cities participated in the longitudinal phase of the evaluation: Philadelphia (PA), Portland (OR), Phoenix (AZ), Omaha (NE), Lincoln (NE), and Las Cruces (NM). These sites represent a diverse range of contexts, from large to medium-sized cities, cities on the East and West Coasts, as well as in the Midwest and Southwest. The initial data collection (1995) sampled 3,500 6th and 7th graders attending 22 schools. Response rates for each of the three waves we used are 87%, 80%, and 86%, respectively (Esbensen 2003). The principal investigators caution, however, that these data are not a random subsection of adolescents. While they also believe that the results should be representative of students attending public schools in a variety of contexts (see Esbensen and Osgood, 1999), sample attrition and missing data reduced the sample for our analysis to approximately 1,500 students.[2] Attrition across waves is not unusual, and, as we expected, individuals lost after wave 1 tended to report higher levels of victimization, delinquent friends, delinquency, and weaker social bonds than those who participated in later waves. The estimates we report in our results below should therefore have a conservative bias. A description of the demographic profile of the sample is provided below in the discussion of the measures.

While the primary goal of the data collection effort was to evaluate GREAT, the principal investigators also measured variables that are theoretically relevant to the study of delinquency and victimization causation, thus permitting researchers rigorously to test substantive hypotheses. Among these measures are items designed to operationalize key concepts in social learning theory (Akers 1985), social bonding theory (Hirschi 1969), self-control theory (Gottfredson and Hirschi 1990), and routine activities/lifestyles theories (Cohen and Felson 1979; Hindelang et al. 1978). Of particular importance, however, is the inclusion of measures of victimization, which makes the GREAT data one of the few sets available where it is possible longitudinally to examine the relationship between self-control and victimization.

[2] We used the multiple imputations by chained equations ''ICE'' available in Stata 9 to impute missing values (Royston 2005a, b). This involved a three-step procedure in which we used the ICE function to generate 10 imputed data sets. We then estimated regression models separately for each of the 10 imputed data sets. Finally, we computed the pooled parameter estimates of the 10 regressions to account for the possible underestimation of standard errors that may be observed in single imputation procedures to obtain more precise parameter estimates (Acock 2005; Rubin 1987; Schafer 1997). Furthermore, to assess if our results were influenced by the number of data sets imputed, we estimated as many as 20 data sets with no improvement in precision above what 10 data sets generated (also see von Hippel 2005).

Measures

Victimization

The latent construct of victimization was measured with three observed variables that assessed the number of times the respondents were victimized during the past year at Times 1 and 3. The three indicators measured personal and property victimization. Respondents were asked to indicate the number of times they (1) were physically assaulted, (2) were robbed, or (3) had experienced theft. The range for each indicator was between 0 and 3. The means for the indicators at Time 3 were: 0.11 (SD = 0.48), 0.23 (SD = 0.39), and 0.68 (SD = 1.07), respectively, indicating that the typical respondent was not a victim of crime and that the most frequently occurring form of victimization was theft. We also followed the same procedure for creating the Time 1 victimization measure, which served as a control variable to assess change in victimization. The means for the indicators at Time 1 were: 0.16 (SD = 0.51), 0.29 (SD = 0.49), and 0.87 (SD = 1.17).[3]

Low Self-control

We used an 8-item composite measure from Time 1 that assessed the various components of low self-control. These questions included: (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; (4) I test myself by doing something risky; (5) I take risk for fun; (6) I believe it is exciting to do things that can possibly get me in trouble; (7) I believe that excitement is more important than security; (8) I spend no effort preparing for the future.'' The response categories for these items was (1 = strongly disagree to 5 = strongly agree). Responses were summed, producing a range of scores from 8 to 40 (mean = 23.49, SD = 5.41), where higher scores indicated lower self-control. The Cronbach's alpha coefficient was 0.78, indicating an acceptable level of index reliability.

Although we did not use the full Grasmick et al. (1993) scale to measure self-control, our measure of self-control is consistent with other studies in that self-control is significantly related to criminal and analogous behaviors (Evans et al. 1997; Forde and Kennedy 1997; Schreck 1999).[4] Furthermore, Pratt and Cullen (2000) reviewed 21 studies based on 17 different data sources and over forty-nine thousand individual cases and found that regardless of measurement differences of low self-control by various independent researchers, it was an important predictor of crime and analogous behaviors, which is also the case for our investigation.

Delinquent Peers

The latent construct of delinquent peers was measured by two indicators at Time 2. The two indicators measured violent and property delinquency of peers. Respondents were asked how many of their friends had engaged in violent acts in the past year (i.e.,

[3] We capped the upper bound to three victimization incidents because very few adolescents reported more than three victimizations.

[4] The GREAT data contained eight items adapted from the Grasmick et al. (1993) scale. In the current study, we used these eight items to form our low self-control construct.

armed robbery, aggravated assault with a weapon, and assault without a weapon), how many had engaged in property offenses (i.e., motor vehicle theft, shoplifting, theft, property destruction). The response category was (1 = none of them to 5 = all of them). We summed the responses to the two indicators to obtain values for violent and property peer associations, respectively. The range for the violent peer indicators was from 3 to 15, with a mean of 4.53 (SD = 2.25) and for property peer associations the range was from 5 to 25 with a mean of 7.41 (SD = 3.54), indicating that the typical respondent reported that s/he had few friends who engaged in either types of crime in the past year. The Cronbach's alpha coefficients for violent peer and property peer associations were 0.79 and 0.87, respectively.

Self-reported Delinquency

The latent construct delinquency was measured by three observed variables at Time 2. Respondents were asked to indicate how often during the past 12 months they had engaged in three types of delinquent activities: violent delinquency (i.e., robbery, aggravated assault, shot at someone), property delinquency (i.e., theft, burglary, motor vehicle theft, shoplifting), and drug delinquency (i.e., used marijuana, used illegal drugs other than marijuana, sold marijuana, sold drugs other than marijuana). Responses were summed for each observed indicator, producing a range of scores from 0 to 12 for violent delinquency, 0–21 for property delinquency, and 0–12 for drug delinquency, where higher scores indicated higher levels of delinquency. The means for the indicators were: 6.51 (SD = 7.84), 7.53 (SD = 9.25), and 3.89 (SD = 5.46). As is usual with delinquency count data, the distribution is highly skewed with substantial outliers boosting the mean (median level of delinquency is actually zero). The Cronbach's alpha coefficients for violent delinquency, property delinquency, and drug delinquency were 0.89, 0.92, and 0.95 respectively.

Parental Attachment

The latent construct of parental attachment was measured with three observed variables at Time 2. The items tapped parent/child communication (''can talk about anything''), parental trust (''always trust me''), and warmth (''always praise when I do well''). The response format was (1 = none of the time to 7 = all of the time). We summed the responses to the three indicators. The range for the three indicators was from 1 to 7, with means of 5.11 (SD = 1.57) for parent/child communication, 5.16 (SD = 1.48) for parental trust, and 5.88 (SD = 1.59) for parental warmth, indicating that the typical student has a warm relationship with his or her parents.

School Attachment

The latent construct school attachment was measured by three indicator variables at Time 2. Respondents were asked to indicate their attachment/commitment with respect to school effort (''I try hard in school''), school importance (''Education is important to me''), and homework (''I complete my homework on time''). The response format was (1 = strongly disagree to 5 = strongly agree). We summed the responses to the three indicators. The range for the indicators was from 1 to 5, with means of 4.17 (SD = 0.91) for school effort, 3.86 (SD = 0.80) for school importance, and 3.82 (SD = 1.07) for homework.

Demographic Control Variables

We controlled for sex, race, family socioeconomic status (SES), and age because these demographic factors have been shown to be associated with victimization (Hindelang et al. 1978; Miethe and Meier, 1994; Mustaine and Tewksbury 1998; Sampson and Lauritsen, 1990). Females comprise approximately 51% of the sample at Time 1. The racial distribution of the sample is as follows: 46% white, 15% African-American, 18% Hispanic, and 21% ''other.'' The mean ages for the sample during the respective waves are 12.2, 12.3, and 13.2. Readers should note that the effects of these variables are not reported in the figures below to simplify the presentation of the results, although they are controlled for in the analysis.

Limitations of Research Design

While the GREAT data offer many possibilities for researching the longitudinal impact of self-control on victimization, the data also impose certain limitations. First, the GREAT data measure friendships through information provided from the respondent. Consequently, the peer delinquency measures may well be biased. For instance, some researchers have speculated that respondent-generated peer delinquency measures may be contaminated to some degree by the tendency of individuals to project their own qualities onto their friends (e.g., Haynie 2001; Gottfredson and Hirschi 1987; Jussim and Osgood 1989; Schreck et al. 2004). Our inclusion of a self-reported delinquency measure might have alleviated potential bias of this sort, since we controlled for the respondent's own criminal tendencies. Additionally, for better or worse, respondent-generated peer items remain the benchmark measures for investigating peer delinquency in both criminological and victimization research (e.g., Lauritsen et al. 1992; Schreck et al. 2002).

Second, the GREAT data's peer measure is also crude to the extent that we were unable to determine whether respondents terminated friendships after victimization (but then later became acquainted with others who were even more delinquent) or kept the same friends (who then perhaps increased their involvement in crime). Given the fluid nature of friendships even in the short-term (see Cairns and Cairns 1994; Sherif and Sherif 1964; Warr, 1996), the latter possibility appears most plausible; however, the data do not allow us to know for certain. Nevertheless, the finding that victims with low self-control continue to have friends with a relatively higher level of delinquency is consistent with theoretical expectations. Researchers may, however, wish to use network data from such sets as the National Longitudinal Study of Adolescent Health (Add Health) to scrutinize in greater detail the impact of victimization on the makeup of peer groups.

A third data limitation is that we only used two measures of risky activities. Recent research testing routine activity theory used extensive lists of activities and lifestyles (e.g., Fisher et al. 1998; Mustaine and Tewksbury 1998).[5] While victims (especially if they have low self-control) appear generally inclined to maintain their

[5] During our initial data analysis runs, we incorporated items measuring such themes as ''exposure to gangs at school'' and ''unattended lifestyles.'' Net of the other variables included in the analysis, their influence on victimization was negligible. We declined to include these measures in the results presented here because having an excessively large number of items in a latent variable structural equation model, relative to the sample size, would have resulted in insufficient degrees of freedom, thus preventing the model from converging.

level of delinquency and associations with criminal compatriots, even at the risk of their own safety, victims may however make other changes to alleviate their risk. For instance, they might elect to move to another home after experiencing a burglary (Dugan 1999). The GREAT data by no means exhaust the range of relevant daily activities that are predictive of victimization or the possible changes victims might make in order to increase their own safety. At the same time, however, the understanding of repeat victimization is only superficially informed by theory (e.g., Pease and Laylock 1996). Few longitudinal data sets besides the GREAT data can offer theoretically relevant measures with which to explore substantive reasons for repeat victimization.

Data Analysis

Structural equation modeling was used to test the theoretical hypotheses. The analysis was performed using Amos 4.0 software (Arbuckle and Wothke, 1999). Models were based on the polychoric correlations because of the ordinal nature of our data (Joreskog and Sorbom, 1996). The method of estimation was generalized least squares. To assess the fit of the models, we did not rely on any single goodness of fit index; instead we used a range of indices to assess the fit of our models. We used the goodness-of-fit index (GFI), the adjusted goodness-of-fit index (AGFI), the root mean square error approximation (RMSEA), and Hoelter's (1983) critical n (CN) to evaluate model fit. It is generally accepted that values higher than 0.90 for the GFI and AGFI, and a CN value above 200, and values smaller than 0.05 for the RMSEA indicate a good fit of the model to the data. All analyses control for sex, race, SES, and age.[6] The models were first estimated separately for boys and girls. However, since subgroup comparisons indicated no significant gender difference patterns, only the results obtained for the pooled sample are presented.

Results

Data analyses proceeded in several steps. First, the intercorrelations among the observed indicators (see Table 1) produced suggestive evidence that is consistent with the theoretical predictions and earlier research (e.g., Schreck et al. 2002). For example, low self-control is positively related to the victimization indicators of theft (0.24), robbery (0.25), and assault (0.23) at Time 3. Further, low self-control is also positively related to delinquency and delinquent peer associations and negatively related to parental and school attachment indicators at Time 2.

Most of the polychoric correlations are statistically significant at the 0.05 level in the expected direction. This suggests that all indicators chosen for this study are empirically, as well as theoretically valid. The measures assumed to be indicators of a common construct were most highly correlated with each other and were correlated in a theoretically predicted fashion with indicators of other constructs. Based on these promising initial findings, the second step was to estimate a measurement model among our theoretical concepts.

[6] Only one of the control variables (sex) emerged significant. Boys were more likely to be victimized than girls. However, the pattern of results for boys and girls were virtually the same.

Table 1 Polychoric correlations, means, and standard deviations among indicators of latent constructs

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1.	1.00																	
2.	0.52	1.00																
3.	0.56	0.58	1.00															
4.	0.41	0.32	0.38	1.00														
5.	0.32	0.43	0.34	0.39	1.00													
6.	0.29	0.31	0.44	0.40	0.42	1.00												
7.	0.24	0.25	0.23	0.17	0.18	0.15	1.00											
8.	0.23	0.19	0.22	0.21	0.20	0.21	0.19	1.00										
9.	0.21	0.23	0.22	0.23	0.22	0.23	0.18	0.72	1.00									
10.	0.22	0.21	0.23	0.22	0.21	0.22	0.19	0.29	0.33	1.00								
11.	0.27	0.24	0.24	0.25	0.24	0.23	0.20	0.28	0.27	0.39	1.00							
12.	0.19	0.21	0.22	0.20	0.22	0.22	0.17	0.39	0.37	0.31	0.34	1.00						
13.	− 0.13	− 0.14	− 0.14	− 0.13	− 0.13	− 0.12	− 0.10	− 0.18	− 0.23	− 0.24	− 0.22	− 0.19	1.00					
14.	− 0.13	− 0.12	− 0.13	− 0.13	− 0.11	− 0.11	− 0.09	− 0.22	− 0.24	− 0.23	− 0.20	− 0.18	0.72	1.00				
15.	− 0.14	− 0.14	− 0.13	− 0.12	− 0.13	− 0.13	− 0.11	− 0.18	− 0.21	− 0.21	− 0.22	− 0.14	0.59	0.61	1.00			
16.	− 0.14	− 0.14	− 0.14	− 0.13	− 0.14	− 0.12	− 0.11	− 0.24	− 0.25	− 0.23	− 0.24	− 0.23	0.24	0.25	0.22	1.00		
17.	− 0.13	− 0.12	− 0.14	− 0.11	− 0.12	− 0.13	− 0.12	− 0.26	− 0.26	− 0.24	− 0.25	− 0.24	0.30	0.30	0.27	0.59	1.00	
18.	− 0.11	− 0.11	− 0.12	− 0.13	− 0.13	− 0.12	− 0.11	− 0.26	− 0.24	− 0.25	− 0.25	− 0.25	0.28	0.31	0.26	0.54	0.58	1.00
Mean	0.68	0.23	0.11	0.87	0.29	0.16	23.49	4.53	7.41	7.53	6.51	3.89	5.11	5.16	5.88	4.17	3.86	3.82
SD	1.07	0.39	0.47	1.18	0.49	0.51	5.41	2.25	3.55	9.25	7.84	5.46	1.57	1.48	1.59	0.91	0.80	1.07

Note: $N = 1510$; All correlations significant at 0.05

1. Theft Time 3
2. Robbery Time 3
3. Assault Time 3
4. Theft Time 1
5. Robbery Time 1
6. Assault Time 1
7. Low self-control Time 1
8. Violent peer delinquency Time 2
9. Property peer delinquency Time 2
10. Property offending Time 2
11. Violent offending Time 2
12. Drug offending Time 2
13. Parent/child conversation Time 2
14. Parental trust Time 2
15. Parental warmth Time 2
16. School effort Time 2
17. School important Time 2
18. Complete homework Time 2

Measurement Model

We specified a measurement model for latent constructs in our theoretical models (see Figs. 1, 2 and 3). The measurement model allows us to test specific hypotheses about the structure underlying the indicators of these latent constructs and to estimate and control for the biasing effects of measurement error (Bollen 1989). This model considers each observed indicator as a linear combination of a latent, unobserved factor plus random measurement error. For example, our models imply that being the victim of theft, assault, and robbery converge together into a single latent concept representing ''victimization.''

Table 2 reports the factor loadings for the construct indicators over time. The factor loadings ranged from 0.53 to 0.86 and show that all of the indicators chosen are acceptable in terms of the extent to which they reflect their underlying concept. The indicators remain statistically significant while demonstrating fluctuations in factor loadings across time. The indicator for low self-control was set to 1.00. The fit indices suggest models that fit the data well.

In sum, the overall assessment of the hypothesized measurement model demonstrates that the variables selected to measure the latent constructs of interest reflect those constructs in a theoretically as well as statistically valid and stable manner,

Table 2 Standardized factor loadings for the indicators of the latent constructs

Variables	Figure 2 loadings	Figure 3 loadings	Figure 4 loadings
Victimization T3			
Theft	0.73**	0.62**	0.56**
Robbery	0.72**	0.65**	0.64**
Assault	0.79**	0.68**	0.69**
Victimization T1			
Theft	0.66**	0.62**	0.54**
Robbery	0.63**	0.58**	0.59**
Assault	0.64**	0.57**	0.61**
Low self-control			
Low self-control index	1.00	1.00	1.00
Delinquent peers			
Violent peers	0.84**	0.73**	0.65**
Property peers	0.86**	0.79**	0.71**
Delinquency			
Violent offending	0.62**	0.62**	0.59**
Property offending	0.60**	0.64**	0.63**
Drug offending	0.53**	0.55**	0.56**
Parental attachment			
Communication	0.83**	–	–
Trust	0.86**	–	–
Warmth	0.71**	–	–
School attachment			
Effort	0.74**	–	–
Important	0.79**	–	–
Homework	0.74**	–	–
GFI	0.99	0.98	0.98
AGFI	0.98	0.97	0.97
RMSEA	0.029	0.021	0.018
CN	949	413	471

**Significant at 0.01

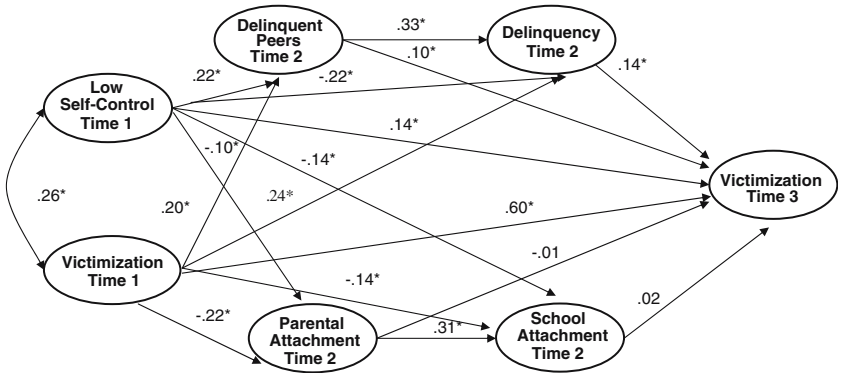

Fig. 2 Estimated conceptual model of victimization. *Note:N* = 1510. $\chi^2(114) = 133.1$; GFI = 0.99; AGFI = 0.98; RMSEA = 0.029; CN = 949; coefficients are standardized; gender, race, SES, age, and measurement error correlations are controlled but not presented in this diagram. The squared multiple correlation for Time 3 victimization is 0.52. $^*P < 0.05$ (two-tailed)

despite some variations across indicators. As expected, the results also show that all indicators should be included in the final model. Given this positive evaluation of the measurement model, we now turn to an evaluation of the structural relationships.

Model Testing: Conceptual Model

We first tested a conceptual model that posited a relationship between low self-control, situational, and individual factors that contribute to victimization. The results for this model are presented in Fig. 2. The effect of Time 1 victimization has been controlled so that the model estimates change in victimization from Time 1 to Time 3. The standardized regression coefficient from low self-control to Time 3 victimization was $\beta = 0.14$. As expected, high levels of low self-control significantly increased the probability of victimization. Furthermore, low self-control was significantly related to delinquent friends ($\beta = 0.22$) and delinquency ($\beta = 0.14$) at Time 2. In turn, the paths from associations with delinquent peers ($\beta = 0.11$) and delinquency ($\beta = 0.14$) were significant predictors of victimization. Individuals who spend a lot of time associating with criminal friends and who engage in offending tend to have a higher risk of victimization regardless of their level of self-control. The path coefficients from low self-control to Time 2 parental attachment ($\beta = -0.10$) and school attachment ($\beta = -0.14$) were significant and inversely related. This suggests that low self-control attenuates social attachments that may be important in guardianship. Consistent with what Schreck and colleagues (2002) found, parental and school attachments were not significantly related to victimization, suggesting that these social bonds may not be enough to guard against victimization in the presence of low self-control and risky lifestyles.[7]

The evidence presented here suggests that self-control and situational factors each directly and independently affect the level of victimization. The model's fit

[7] To assess whether our results were victimization specific, we disaggregated victimization into the three specific types used in our analyses. The results did not change and maintained the pattern presented in the models.

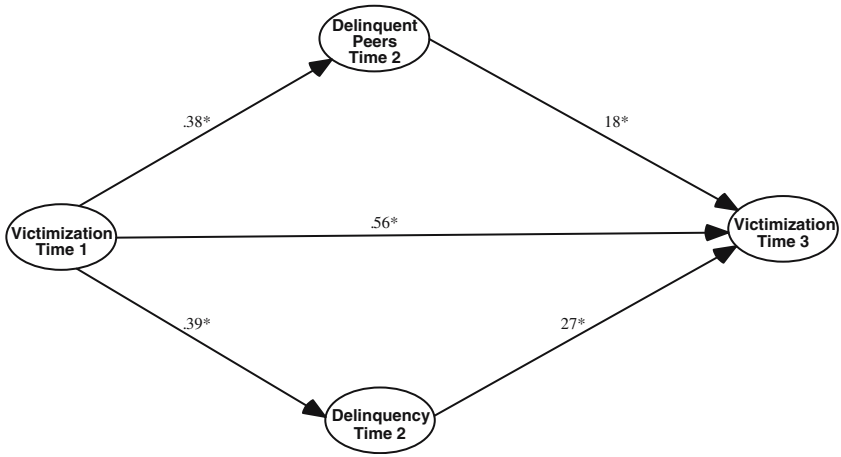

Fig. 3 Estimated model for individuals with low self-control. *Note:* $N = 330$. $\chi^2(38) = 39.7$; GFI = 0.98; AGFI = 0.97; RMSEA = 0.021; CN = 413; coefficients are standardized; gender, race, SES, age, and measurement error correlations are controlled but not presented in this diagram. The squared multiple correlation for Time 3 victimization is 0.48. $^*P < 0.05$ (two-tailed)

indices suggest a satisfactory fit of the data to the model (GFI = 0.99; AGFI = 0.98; RMSEA = 0.029; CN = 949).

Model Testing: Consequences of Self-Control on Victimization

Another important issue of this study addresses the consequences of self-control on situational risk factors for future victimization. We divided the sample into two distinct self-control groups: adolescents scoring above the 75th percentile in self-control and those scoring below the 25th percentile.[8] This procedure allowed us to identify adolescents who were high and low on self-control (Piquero *et al.* 2004). We then assessed their risk for victimization. Figure 3 presents the model for individuals who scored *low* in self-control (i.e., in the lowest quartile). Again, the model controls for Time 1 on Time 3 victimization to assess change in victimization risk. The standardized path coefficient ($\beta = 0.56$) from Time 1 victimization to Time 3 victimization is significant and stable, suggesting that individuals with low self-control tend have victimization risk that is stable and strong over time. Further, the paths from Time 1 victimization to Time 2 measures of delinquent peer associations ($\beta = 0.38$) and delinquency ($\beta = 0.39$) are significant. This suggests that individuals who display low levels of self-control continue to engage in activities that increase their risk of victimization. As was the case in Fig. 2, delinquent peers and self-reported delinquency also increase victimization risk. The model's fit indices suggest a satisfactory fit of the data to the model (GFI = 0.98; AGFI = 0.97; RMSEA = 0.021; CN = 413).

Moreover, we analyzed a similar model for individuals who display *high* levels of self-control in Fig. 4. The path from victimization at Time 1 to victimization at Time

[8] In every case, the means for the low self-control group were significantly higher than the means for the high self-control group. For example, the low self-control group reported higher levels of victimization, associations with delinquent peers, and delinquency. All *t*-values were significant at 0.01.

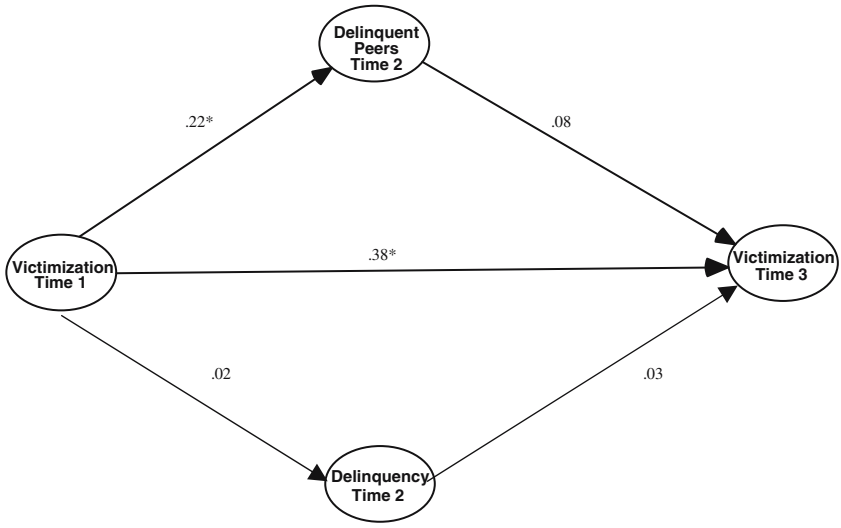

Fig. 4 Estimated model for individuals with high self-control. *Note:* $N = 473$. $\chi^2(38) = 47.8$; GFI = 0.98; AGFI = 0.97; RMSEA = 0.018; CN = 471; coefficients are standardized; gender, race, SES, age, and measurement error correlations are controlled but not presented in this diagram. The squared multiple correlation for Time 3 victimization is 0.31. $^*P < 0.05$ (two-tailed)

3 suggests a statistically significant level of stability over time in victimization. However, the path coefficient—or degree of stability—is about 32% lower in magnitude (0.38 vs. 0.56) between the models.[9] Moreover, the path from victimization to delinquent peers is significant. Yet again, the magnitude of the coefficient is about 38 percent lower for the high self-control group (0.25 vs. 0.38). The path coefficients from delinquent peers ($\beta = 0.08$) and delinquency (0.03) at Time 2 to victimization at Time 3 are not statistically significant, as is the case for the *low* self-control group. Overall, the results suggest that individuals with lower levels of self-control tend to continue on a path that increases their risk for victimization. Those individuals with higher levels of self-control tend to change their lifestyle patterns after experiencing victimization. The model's fit indices suggest a satisfactory fit of the data to the model (GFI = 0.98; AGFI = 0.97; RMSEA = 0.018; CN = 471).

Conclusion

We began by asking whether self-control at one time point is a significant predictor of victimization at another point in time. As we noted, because the studies investigating the connection between self-control and victimization had only employed

[9] These path coefficients are significantly different. We used the equality of coefficients test which allows us to directly compare coefficient differences across models using the following equation: $t = b_1 - b_2/\sqrt{(\mathrm{SE}\, b_1)^2 + (\mathrm{SE}\, b_2)^2}$ (Paternoster et al. 1998). While victimization is stable across both high and low self-control groups, a closer look at the coefficients revealed that victimization risk has a stronger positive effect for the low self-control group (0.56 vs. 0.38; $t = 2.76$; $P < 0.05$). We also followed the same procedures for victimization to delinquent peer associations. Again the effect of victimization to delinquent peers is stronger for the low self-control group (0.38 vs. 0.22; $t = 2.41$; $P < 0.05$). It should be noted that we used unstandardized parameters for model comparisons.

cross-sectional data sets, the longitudinal association between self-control and victimization remained a matter for speculation. This matter is substantively important. One of the central arguments of self-control theory is that individual differences in self-control tend to become stable during childhood. Consequently, low self-control measured at age 12 should predict crime and ''crime-analogous'' behaviors (like vulnerability to crime) potentially many years into the future. Because the theory indicates that persistent vulnerability exists among those with low self-control, we hypothesized that such individuals would have a greater number of experiences with later victimization, even net of other established correlates of victimization (like earlier victimization, self-reported delinquency, peer delinquency, and the like). Our results clearly supported this hypothesis, with self-control independently and to a statistically significant degree predicting later victimization. This research thus adds to the growing literature identifying low self-control as an antecedent of victimization risk (Forde and Kennedy, 1997; Piquero et al. 2005; Schreck 1999; Schreck et al. 2002; Stewart et al. 2004).

Over the time period that was the focus of our data analysis, we found that there is significant stability in victimization. Victims of predatory crime tend to be the best candidates for future victimization, even net of the other variables that we measured. Self-control does account for some of this stability; however, as this stability is apparently not entirely a function of self-control (at least as we have measured it here), the question remains as to the origin of this stability. Our analyses, for instance, did not control for area characteristics, which could help explain some of why earlier victimization is the strongest predictor of future victimization. Community explanations of victimization, for instance, have received considerable attention in the literature (e.g., Lauritsen 2001; Rountree et al. 1994; Wilcox et al. 2003). Neither did our research explore the possible role of school or family ecological contexts as sources of stability (e.g., Schreck et al. 2003). That is, the adolescents in our sample may live in the same disorganized communities, schools, and families for the period of our study, which might account for the stability of victimization over time (Osborn and Tseloni 1998).

Turning to our second major research question, we reasoned that individuals possessing low self-control would not be inclined to change their participation in risky activities in response to earlier victimization. For purposes of this research, ''risky activities'' refers specifically to one's own delinquent behavior and association with criminal friends. At least in our study, self-control appears to determine whether individuals continue on the same path or make lifestyle changes. Individuals possessing low self-control who experience victimization exhibit significantly greater longitudinal stability in their delinquent acts as well as their friendships with delinquents than is the case with those with greater self-control.[10] We should note, however, that self-control theory would not endorse the view that victimization, or any other concept available to criminologists, would be responsible for *permanent* desistance from crime (Gottfredson and Hirschi 1990; Hirschi and Gottfredson 1983). According to the theory, only age is responsible for sustained decreases in

[10] Other research appears to support this conclusion that experience with ''negative'' earlier events apparently does not lead to changes in behavior. Piquero and Pogarsky (2002), for instance, found that the receipt of punishment had a positive relationship with later offending behavior. Moreover, the perceptions of the offenders about their risk of punishment appeared unaffected by their earlier misfortune.

crime over the life course. Our analysis indeed only analyzes a relatively short-term window with respect to stability in delinquency and delinquent friendships. Individuals may, over a longer time period, revert back to the lifestyles that they were in the habit of living before they ever became victims. Readers should also be aware that our measure of victimization is silent on the degree of harm done the victim. It is likely that some of the stability we reported may actually reflect the trivial impact of some of the victimization incidents rather than low self-control. Future data collection efforts should examine whether self-control determines responses to known severe instances of victimization.

In conclusion, we believe that this research has important implications for Gottfredson and Hirschi's general theory of crime as well as the study of victimization more generally.[11] To date, six studies, including this one, using varied samples drawn from multiple contexts and age spectra (from the earliest teenage years through adulthood) report the same results. People with low self-control have higher levels of victimization (Forde and Kennedy 1997; Piquero et al. 2005; Schreck 1999; Schreck et al. 2002; Stewart et al. 2004).[12] While political sensitivities push against ''victim-blaming'' (see, for instance, Karmen 2003), the findings nevertheless support the idea that those who have low self-control facilitate, provoke, or precipitate their own victimization. This is not to say that all victims have low self-control (because context also matters; see Osborn and Tseloni 1998), or that those with low self-control deserve victimization, but that research has uncovered a potentially significant fact about victimization, relatively unrecognized to this point, that must be acknowledged if we are to understand why some individuals become victims.

Additionally, the contribution of low self-control to victimization appears to be longitudinally persistent, thus helping explain why repeat victimization occurs. Further research is clearly needed to verify this result, as well as to disentangle the community and other external contexts from individual antecedents of repeat victimization. Nevertheless, we can speculate on the policy importance of this finding of stability. If the stability of victimization is indeed a consequence of low self-control, then it would follow that it is unreasonable to expect those with low self-control to make meaningful self-protective changes in their lifestyles. Thus, we could a priori predict the (in)effectiveness of crime prevention education programs. Indeed, one may view these programs as analogous to attempts to ''rehabilitate'' offenders, and one might expect to see similar disappointing results (e.g., Finkelhor and

[11] We also believe that evidence that criminological themes like the stability of crime apply to victimization makes a still stronger case for extending other theories of crime to victimization. We are indebted to an anonymous referee for pointing out the possibility that Agnew's (1992) general strain theory and social learning theory (Akers 1985) may have relevance. For example, it is plausible that persons cope with victimization by lashing out, which further increases the chances for revictimization. Individuals may also become withdrawn and depressed (i.e., retreat) in response to victimization, thereby marginalizing themselves and increasing their vulnerability (see, also, Felson 1992). Individuals may also, as a consequence of certain types of victimization, develop behavior patterns that endorse the use of crime/violence in interpersonal interaction, which again increase future victimization risk. Although the victimization literature on these theories is virtually nonexistent, it is our view that knowledge about victimization could only benefit from testing ideas originally intended for explaining crime, leading to more complex and informative analyses than those offered to date.

[12] We found support for our hypothesized models. However, one anonymous referee pointed out that the effect sizes for our theoretical variables range from medium (< 0.30) to small (< 0.10) using Cohen's (1988) recommendations (also see Kline, 2005). Thus, our conclusions should be interpreted with these effect sizes in mind.

Dziuba-Leatherman 1995). Instead, the theory would recommend that efforts to instill self-control in young children, combined with situational crime prevention (which does not require the cooperation of the victim in order to be successful), might be the most promising means of protecting potential victims. Nevertheless, much additional work is needed with respect to verifying and establishing self-control as a reason for repeated victimization before we can make this predictions about crime prevention education programs with confidence.

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