

The Gottfredson–Hirschi Critiques Revisited

Reconciling Self-Control Theory, Criminal Careers, and Career Criminals

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Revisiting Gottfredson and Hirschi's critiques of criminal career research, the current study views low self-control as being analogous to criminal propensity and examines its predictive validity of career criminality among 723 incarcerated delinquent youths. Four key findings emerged. Compared to noncareer offenders, career criminals had significantly lower levels of self-control. Second, youths scoring one standard deviation above the mean on the Self-Control Scale had an odds ratio of 5.36 of becoming a career criminal. Third, self-control predicted career criminal membership with receiver operator characteristic–area under the curve sensitivity accuracies between 74% and 87%, suggesting that self-control is a potentially useful screening device for chronic criminality. Fourth, low self-control was overwhelmingly the strongest predictor of career criminality and far exceeded the impact of age, race, ethnicity, gender, socioeconomic status, mental illness, attention deficit hyperactivity disorder diagnosis, and trauma experience. Further integration between self-control and criminal career research is urged.

Keywords: *self-control; career criminal; criminal careers; delinquency; violence*

During the 1980s, Michael Gottfredson and Travis Hirschi (1990) published a series of articles that were caustically critical of the criminal career paradigm and so laid the groundwork for a parsimonious general theory that implicated a single construct to explain crime. As such, they presented the age–crime curve as a brute social fact (Hirschi & Gottfredson, 1983). Accordingly, across settings, epochs, and types of data, involvement in crime rises steadily in middle adolescence, peaks at early adulthood, and then declines sharply thereafter. The age–crime curve was theorized to be invariant—that is, it could not be explained by other phenomena.

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Theories that attempted to utilize demographic and other sociological constructs to explain a natural fact were in error. From this perspective, both high-rate and low-rate offenders followed the same general pattern of offending; even high-rate offenders desisted from crime and were generally unproblematic during their adult years.

Generally speaking, the more serious or persistent the offender, the earlier in life his or her criminality is evident. Hirschi and Gottfredson (1983) assumed that some individual-level phenomenon akin to criminal propensity explains why the worst offenders tend to start their criminal careers early and commit crime with greater frequency. In this sense, criminologists need to know only about an individual offender at one point in time, given that his or her propensity is stable throughout life. Consequently, cross-sectional data and designs that capture the characteristics of an individual at a discrete time yield the same substantive findings as those collected longitudinally. In other words, high-rate offenders always offend more than low-rate offenders. It is for this fundamental reason that Hirschi and Gottfredson (1993) were critical of longitudinal designs and their putative costs.

In 1986, the study of criminal careers and career criminals became a focal point of criminological research as marked by a two-volume National Academy of Sciences publication (Blumstein, Cohen, Roth, & Visher, 1986). That same year, Gottfredson and Hirschi (1986) presented their most searing critique of the idea and study of career criminals. They claimed that the idea of a career criminal is more than a century old and that it has been recurrently studied as criminal justice systems attempt to deal with habitual criminals but that such criminals are sufficiently rare that they are not attractive targets of criminal justice policy. For example, given the salience of prior record, career criminals tend to be older when it is discovered they have a lengthy record; therefore, they will be incarcerated for their prior conduct when their current conduct illustrates a reduction in crime. In other words, even the offending path of career criminals follows the age-crime curve. Gottfredson and Hirschi (1987, 1988) also continued to assail longitudinal research and the programmatic and funding implications of criminal career research. Gottfredson and Hirschi's stance (1987) on the study of crime vis-à-vis the criminal perspective can be summarized as follows:

The longitudinal study is a consequence of particular theories or orientations toward the causes of crime. Theories that see crime as a consequence of development processes or stages . . . an occupation or state one moves into and out of . . . or the consequences of positive learning by always malleable individuals—all suggest the desirability or necessity of following individuals over time. Other theories see crime as a consequence of relatively stable characteristics of people and the predictable situations and opportunities they experience. These theories do not presume that major changes in criminal activity are associated with entry into or exit from roles, institutions, or organizations. Such theories are therefore adequately tested at any point in the life course, the particular point selected by reference to expected distributions of the important variables. (p. 608)

In response, Blumstein, Cohen, and Farrington (1988a, 1988b) pointed to the usefulness of the criminal career paradigm for investigating various components of the offending career, such as onset, career length or span, continuity, escalation, versatility and specialization, desistance, and termination. A critical finding from criminal career research was that offenders, even high-rate and career criminals, frequently changed their offending behavior over time—and in often-unpredictable ways. Because offending careers demonstrated dynamism, multiple points of data collection and observation were needed because longitudinal designs allowed for each person to serve as his or her own control over time. To defenders of the criminal career perspective, a static approach like the one advanced by Gottfredson and Hirschi (1990) was methodologically limited.

Owing to the vociferousness of Gottfredson and Hirschi's critiques (1986, 1987, 1988), self-control theory is implied to be antithetical to the study of criminal careers. We take a different view. Instead of viewing self-control theory as a foil to the criminal career perspective, we hypothesize that self-control is a complementary, useful construct in predicting serious, violent, and chronic antisocial behavior. The current study views low self-control as being analogous to criminal propensity and thus examines its predictive validity of career criminality among a sample of incarcerated juvenile delinquents. To concentrate on the empirical overlap between self-control and career criminality, the following literature review focuses on self-control research that encompasses a criminal career perspective and criminal career outcomes (e.g., arrests, versatility of offenses).

Literature Review

Persons with low self-control are impulsive, insensitive, action-oriented, negatively tempered risk takers who tend to perform poorly and fail to meet the responsibilities of school, work, and family (Gottfredson & Hirschi, 1990). Hundreds of empirical tests of Gottfredson and Hirschi's general theory (1990) have rendered low self-control as one of the most consistently valuable predictors of crime (for reviews, see Britt & Gottfredson, 2003; DeLisi, 2005; Pratt & Cullen, 2000). The empirical strength holds across variations in gender, race and ethnicity, country of origin, degree of criminality, data source, and measurement. In addition to participating in criminal behavior, persons with low self-control also commit significantly greater amounts of deviant, imprudent, and maladaptive behaviors across numerous contexts than do persons with higher levels of self-control (DeLisi, Hochstetler, & Murphy, 2003; T. D. Evans, Cullen, Burton, Dunaway, & Benson, 1997; Gibson & Wright, 2001; Higgins, 2004, 2005; Hochstetler & DeLisi, 2005; McGloin, Pratt, & Maahs, 2004; Vazsonyi, Wittekind, Belliston, & Van Loh, 2004; Wiebe, 2003; Winfree, Taylor, He, & Esbensen, 2006).

A relatively small body of research has addressed self-control theory within a criminal-careers context. Benson and Moore (1992) explored the tenability of self-control theory by using a sample of 2,462 persons convicted of white-collar crimes

(bank embezzlement, bribery, income tax violations, false claims, and mail fraud) and 1,986 persons convicted of conventional crimes (narcotics offenses, postal forgery, and bank robbery). They found that both groups demonstrated versatile criminal involvement, although white-collar offenders were more likely to specialize in white-collar crimes. Moreover, both offender groups demonstrated comorbidity evidenced by problems with alcoholism, substance abuse, poor school attainment, and social maladjustment. These problems were significantly more pronounced among conventional criminals, thus suggesting that street offenders have lower self-control than that of white-collar offenders.

Longshore, Turner, and Stein, (1996) examined self-control theory using 580 offenders involved in the Treatment Alternatives to Street Crime program, which comprised new arrestees and correctional clients referred by probation and parole for suspected drug problems. They found that self-control was predictive of crimes of force and fraud and that offenders with lower self-control committed more crimes. Their work is noteworthy in that it is the first investigation of self-control theory that uses a sample of persons with extensive criminal histories. In a subsequent study, Longshore and Turner (1998) found that self-control was lowest among offenders who committed the greatest amount of crimes. For instance, during the 6-month recall period, the distribution of force crimes ranged from 0 to 126 and for fraud crimes, 0 to 708. This means that street offenders with the lowest levels of self-control committed more than 20 murders, rapes, robberies, and assaults and 118 property crimes per month. Similarly, DeLisi (2001a, 2001b) used a probability sample of 500 adult arrestees to explore the applicability of self-control theory among known offenders. Those with lower self-control were significantly likely to accumulate arrests for varied types of criminal behavior, including violent, property, white-collar, and nuisance offending. Furthermore, low self-control was related to various criminal justice outcomes and behaviors, such as missing court appearances, violating probation and parole sentences, escaping from custody, and being sentenced to prison.

Low self-control has also proven to be a significant facilitator of the chronic recidivism that typifies habitual offenders. Benda (2003) conducted a 5-year follow-up of 601 adult male graduates of a boot camp and found that self-control was the strongest predictor of recidivism among offenders whose criminal careers started before or after age 10. For both onset groups, the effects of self-control exceeded those of many acknowledged correlates of crime, including delinquent peer associations, family attachments, abuse history, frustration and general strain, gang involvement, weapons violations, and drug history. Similarly, W. P. Evans, Brown, and Killian (2002) examined the postrelease behavior of formerly institutionalized juvenile delinquents. Controlling for demographic, criminal history, and family variables, the researchers found that youth who possessed higher levels of decision-making competence scored highest on the Postdetention Success Scale. Youth who avoided risky, impulsive decisions also had stronger beliefs about their long-term ability to remain crime-free. Finally, investigators have provided evidence for the generality of self-control theory

even among high-rate offenders. For instance, low self-control was predictive of drug problems among a diverse sample of 620 jail inmates in Philadelphia (De Li, 2005); empirically linked to violent offending and homicide victimization among nearly 4,000 parolees from the California Youth Authority (Piquero, MacDonald, Dobrin, Daigle, & Cullen, 2005); and related to the most chronic, serious, and persistent offenders among 985 respondents from a New Zealand birth cohort (Piquero, Moffitt, & Wright, 2007).

To summarize, despite Gottfredson and Hirschi's exhortations (1990) against the criminal career paradigm, criminologists have established clear empirical linkages between the self-control construct, various dimensions of the criminal career, and the assorted behaviors of career criminals. However, with perhaps one exception (Piquero et al., 2007), prior studies have not formally linked the two literatures. The current study seeks to solidify the relationship between self-control and the study of criminal careers by using a large study group of institutionalized juvenile offenders.

Method

Sample and Study Procedures

At the time that the study was undertaken, the sample represented 97.7% ($n = 723$) of the residents ($n = 740$) in the Missouri Division of Youth Services (DYS), which is the legal guardian of all residents who are committed to its care by the state's 45 juvenile courts. The DHS population is representative of nationally incarcerated youth with regard to the average age and gender distribution of offenders, percentage of delinquent versus status offenders, and number of state youth currently incarcerated per 100,000 adolescents (Sickmund, 2004). No seasonal, administrative, legislative, or clinical issues that might have operated to reduce the representativeness of the sample were found. In preparation of data collection, all interviewers completed an intensive 1-day training session, and an interview editor was on-site at each facility as youth were interviewed, to minimize interviewer omissions and errors. DHS residents are under 24-hour-a-day supervision; thus, interviews were conducted in large rooms that provided private areas, where confidential interviews could be conducted with three to six youth.

All current residents were recruited for study participation at the time that interviewing commenced. Participation in the survey was voluntary. The sample recruitment protocol ensured that no youth who had completed the interview at one facility would be successful in completing or attempting to complete the interview at another facility. This study was approved by DHS, the Washington University Human Studies Committee Institutional Review Board, and the federal Office of Human Research Protection, and it was granted a certificate of confidentiality by the National Institute on Drug Abuse. Youth received \$10 for their participation.

All youth providing written informed consent completed the structured, face-to-face, approximately 45-min interview, which assessed the following: demographic characteristics, lifetime and annual use of 65 inhalants, other drug use, substance-related problems, current and lifetime psychiatric symptoms, thoughts of suicide and actual suicide attempts, trauma and victimization history, antisocial personality traits, and violent and nonviolent criminal activity. Additional information on the study sample and procedures has been published elsewhere (Vaughn & DeLisi, in press; Vaughn, Howard, Foster, Dayton, & Zelner, 2005).

Measures

Career Criminality Index. To capture versatility in offending, related problem behavior, and personal victimization, we used the Career Criminality Index (CCI). The CCI was constructed by incorporating scale items from self-report measures that assess violent and nonviolent delinquency, age at onset for offending, police contact and appearance in juvenile court, lifetime polysubstance use, and personal victimizations.¹ These overlapping problem behaviors match the behavioral repertoire of serious, violent, and chronic juvenile offenders (Elliott, 1994; Huizinga, Loeber, Thornberry, & Cothorn, 2000; Loeber & Farrington, 1998, 2001). The number of self-reported offending and personal victimizations encountered was based on the 12 months prior to residential incarceration. The lifetime polysubstance use measure assessed 14 types of substances, such as alcohol, heroin, marijuana, hallucinogens, cocaine, amphetamines, inhalants, and others. Standardized items forming the CCI were found to be internally consistent ($\alpha = .82$). Items forming the CCI were subjected to exploratory factor analysis utilizing an oblique rotation. The scree plot and the extracted sums of squares loadings (i.e., eigenvalues and percentage of cumulative variance) pointed toward a single dominant factor, thus supporting the unidimensionality of the index.

Low self-control. We constructed a 15-item Self-Control Scale based on items rationally derived from personality measures and hostility scales. The items selected reflect components of self-control that are consonant with Gottfredson and Hirschi's theory (1990) in that they involve forms of impulse control, risk taking, difficulty in controlling one's temper, and susceptibility to boredom.

We standardized items into z scores and subjected them to exploratory factor analysis, and results suggest a single dominant factor. We then used maximum-likelihood factor analysis that considered one to four factors. Results from this procedure indicate reduction in chi-square fit indices in procession from one to four factors, thereby demonstrating unidimensionality. Internal consistency reliability for the Self-Control Scale showed good reliability ($\alpha = .83$). Table 1 displays Self-Control Scale items with their factor-loading coefficients.

Table 1
Self-Control Scale Items and Factor Loadings ($\alpha = .83$)

Item	Coefficient
You act without thinking of the consequences.	.57
You get bored easily.	.43
You do risky or dangerous things.	.48
You do not plan ahead or you leave things until the last minute.	.45
I generally prefer to act first and think later.	.59
I tend to get crabby and irritable when I have too many things to do.	.41
I occasionally do something dangerous because someone has dared me to do it.	.49
I weigh the pros and cons (i.e., pluses and minuses) of major decisions carefully before making them.	.45
I quickly become very annoyed at people who do not give me what I want.	.53
Feeling easily annoyed or irritated.	.62
Temper outbursts that you could not control.	.59
Having urges to beat, injure, or harm someone.	.59
Having urges to break or smash things.	.68
Getting into frequent arguments.	.60
Feeling so restless you couldn't sit still.	.59

Psychiatric symptoms. The Brief Symptom Inventory was used to assess current psychiatric symptoms. This instrument consists of 53 items with a Likert-type format consisting of nine subscales and an overall Global Severity Index relating to major mental health disorders (anxiety, depression, etc.) to characterize current psychiatric status and psychological distress. Studies support the inventory as a reliable and valid measure of current psychiatric symptoms (Derogatis & Savitz, 2000). Total inventory reliability in the present study was excellent ($\alpha = .96$), with subscale reliabilities ranging from .70 (Phobic Anxiety) to .83 (Depression).

Mental health diagnosis, attention deficit hyperactivity disorder, and head injury. Participants were asked whether they have a current mental health disorder diagnosis—specifically, attention deficit hyperactivity disorder (ADHD)—for which they are currently taking medication. In addition, they are asked whether they have experienced a head injury that led to a loss of consciousness (blackout period) that lasted for at least 20 min. Both ADHD and head injury are strongly correlated with serious antisocial behavior in juveniles (Beauchaine, Katkin, Strassberg, & Snarr, 2001; Lahey, Moffitt, & Caspi, 2003; Raine, 2002; Raine et al., 2005).

Traumatic experiences. The Traumatic Experiences subscale of the Massachusetts Youth Screening Instrument—Second Version (Cauffman, 2004; Espelage et al., 2003; Grisso, Barnum, Fletcher, Cauffman, & Peuschold, 2001) was used to assess the severity of past trauma. Reliability analyses from the present study indicate adequate reliability for the Traumatic Experiences subscale ($\alpha = .77$ for females, $\alpha = .68$ for males).

Demographics. Demographic variables consisted of age ($M = 15.5$ years, $SD = 1.2$ years), gender (0 = male, 1 = female), ethnicity (0 = White, 1 = African American, 2 = Hispanic, 3 = multiethnic or other), and family receipt of public assistance (0 = no, 1 = yes), which served as a socioeconomic status proxy.

Analytical Procedures

We examined convergence between self-control scores and the CCI in a number of ways. First, we created a dichotomous variable that comprised noncareer criminal membership ($n = 646$) and career criminal membership ($n = 72$), based on a cut point at the 90th percentile on the CCI (five cases were removed from the analysis because of missing data). The goal was to restrict membership in the career criminal group and be confident in its specifications vis-à-vis previous chronic offender research (Blumstein et al., 1986; DeLisi, 2005; Moffitt, 1993; Piquero, Farrington, & Blumstein, 2003; Wolfgang, Figlio, & Sellin, 1972). Following comparative analyses of the two groupings and the presentation of effect size differences (Table 2), we examined the likelihood that a high score (i.e., one standard deviation above the mean) on the Self-Control Scale and on relevant covariates would identify membership in the career criminal group, using logistic regression. We employed the cut score of one standard deviation because the Self-Control Scale was normally distributed and because we wanted to facilitate direct comparisons with other independent variables that were categorical. Following logistic regression analysis, we sought to examine the positive predictive power of the self-control measure in correctly classifying career criminal membership by utilizing a plot of sensitivity and specificity generated from a receiver operator characteristic (ROC) graph and by examining the area under the curve (AUC). This ROC–AUC technique is important for establishing whether self-control scores can predict with better-than-chance accuracy who is in the career criminal group. Next, we explored the incremental validity of self-control factor scores over and above demographic and mental health variables in predicting the CCI as a continuous measure, by removing the cut point and using standard hierarchical multiple regression techniques. Regression diagnostics were conducted to test for multicollinearity and to help ensure unbiased estimates. In addition, normality of residuals was checked to ensure regression assumptions; as such, no violations were detected.

Results

Differences Between Career and Noncareer Criminal Groups

As shown in Table 2, only one significant demographic difference emerged. Hispanics were significantly more prevalent among the career criminal group than the noncareer criminal group. Otherwise, there were no significant proportional demographic differences between noncareer and career criminal groups. Interestingly, there were equal proportions of females in the career group. This finding contrasts with previous

Table 2
Descriptive Characteristics of Career Criminal ($n = 72$)
and Noncareer Criminal ($n = 646$) Groups

	Noncareer Group <i>n</i> (%)	Career Group <i>n</i> (%)	Effect Size ^a
Gender			
Male	562 (87.0)	63 (87.5)	
Female	84 (13.0)	9 (12.5)	
Ethnicity			
African American	215 (33.3)	21 (29.2)	
White	360 (55.7)	37 (51.4)	
Hispanic	21 (3.2)	7 (9.7)*	
Multiethnic	50 (7.7)	6 (8.3)	
Receipt of welfare	259 (41.0)	28 (39.0)	
	Noncareer Group <i>M</i> (<i>SD</i>)	Career Group <i>M</i> (<i>SD</i>)	Effect Size ^a <i>d</i>
Age	15.5 (1.3)	15.6 (0.94)	0.09
Self-control	-0.7 (7.7)	6.7 (8.4)***	0.92
General delinquency	20.8 (14.5)	58.3 (16.2)***	2.44
Victimization	5.3 (4.6)	15.9 (7.6)***	1.69
Violent offending	8.7 (7.6)	26.0 (10.2)***	1.92
Nonviolent offending	12.1 (10.1)	32.2 (10.7)***	1.93
Traumatic experience	2.8 (1.6)	4.0 (1.4)**	0.80
Lifetime substance use	14.3 (9.3)	28.1 (11.3)***	1.33

a. Guideline for effect size interpretation: 0.20 = small, 0.50 = medium, 0.80 = large.
 For χ^2 and *t* tests: * $p < .05$. ** $p < .01$. *** $p < .001$.

research on career criminal membership with respect to gender (DeLisi, 2002; Moffitt, Caspi, Rutter, & Silva, 2001), but it is consistent with other research (White & Piquero, 2004). There were no significant differences with respect to age. As expected, there were significant differences in mean self-control scores and mean levels of general delinquency, victimization, violent and nonviolent offending, traumatic experiences, and lifetime substance use. All of the differences were large in terms of effect size using Cohen's *d* index (1988): self-control ($d = .92$), general delinquency ($d = 2.44$), victimization ($d = 1.69$), violent offending ($d = 1.92$), nonviolent offending ($d = 1.93$), traumatic experiences ($d = .80$), and lifetime substance use ($d = 1.33$).

Likelihood of Low Self-Control Predicting Career Criminal Membership

Table 3 reveals results from the binary logistic regression model's assessing the likelihood that high scores on the Self-Control Scale (with one standard deviation above the mean indicating lower levels of self-control) predict the CCI with demographic and

Table 3
Logistic Regression Results Predicting the
Likelihood of Career Criminal Membership

	<i>B</i>	<i>SE</i>	Exp (<i>B</i>)
Age	.039	.117	1.040
Male	.309	.417	1.361
African American	.147	.335	1.158
Hispanic	-.878	.533	.416
Multiethnic	.191	.510	1.210
Receipt of welfare	-.145	.279	.865
Head injury	.477	.312	1.612
Mental illness	.287	.370	1.332
ADHD	.526	.363	1.692
High trauma	.785	.308	2.192*
Low self-control (<i>SD</i> + 1)	1.679	.294	5.359***
Constant	-3.975	2.056	.019
Model χ^2	69.95*** <i>df</i> = 11		

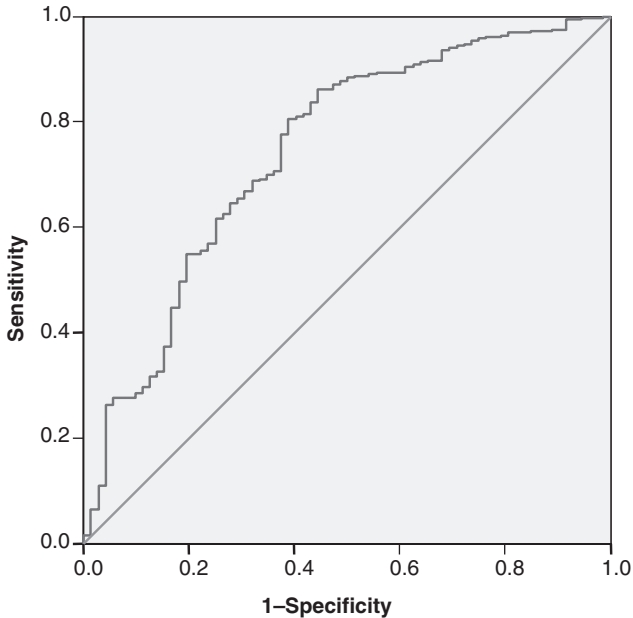
Note: ADHD = attention deficit hyperactivity disorder.

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

mental health covariates. Findings indicate that low self-control scores and high trauma scores significantly increase the probability of career criminal membership. High trauma classification was found to be approximately twice as likely (odds ratio = 2.19, $p < .01$) than low trauma to be in the career criminal group. Scores on the Self-Control Scale at one standard deviation above the mean resulted in more than a 500% increased likelihood of being in the career criminal group (odds ratio = 5.36, $p < .001$).

We continued assessing the ability of the self-control measure to classify career criminal membership by generating a ROC analysis and associated AUC graph for the Self-Control Scale. A ROC–AUC analysis facilitates the testing of a measure’s sensitivity (true positive) and specificity (true negative) in efficiently classifying membership in a dichotomous outcome. If the probability of a test is .5 under the curve (i.e., null hypothesis), then true positives and false positives are essentially identical, whereas a value of 1.0 equals perfect predictive accuracy. Figure 1 displays the results of the ROC–AUC analysis for the Self-Control Scale, showing the percentage AUC that correctly identifies career criminal membership. This measure was moderately able to classify career membership, with 74.4% ($SE = .033$, $p < .001$) AUC sensitivity accuracy. We next wanted to know what the sensitivity and specificity of the self-control measure would be if we used high scores, as in logistic regression analysis (one standard deviation above the mean). Results using the cut score of 8.13 (range = –20.9 to 23.3) indicate a sensitivity of 87.4% and a specificity of 48.6%. These results suggest that this measure possesses potential utility as a screening measure for career criminality.

Figure 1
Receiver Operator Characteristic Results Assessing Classification Accuracy
of the Self-Control Scale in Predicting Career Criminal Membership



Incremental Validity of Low Self-Control

In the next set of analyses, three regression models were examined. The first contains a demographic set of variables (Model 1), followed by a set of mental health variables (Model 2), and finally, the complete model with low self-control (Model 3). The goal was to partial out the amount of variance that low self-control would account for in the CCI as an interval-level variable while controlling for demographic variables and mental health covariates, such as having a head injury that leads to unconsciousness, presenting global psychiatric symptoms, and possessing a mental health diagnosis (specifically, an ADHD diagnosis). As shown in Table 4, low self-control ($b = 0.158$, $\beta = 0.384$, $p < .001$) was a significant predictor over and above demographic and mental health variables. Low self-control uniquely accounted for 7% of explained variance in the CCI. Having a head injury ($b = 1.350$, $\beta = 0.156$, $p < .001$) was also a significant predictor of CCI. Compared to males, females had lower mean scores on the CCI, and African Americans and Hispanics had somewhat higher mean scores than those of Whites. Finally, we evaluated whether head injury was interacting with low self-control (thereby suggesting frontal

Table 4
Career Criminal Index Regressed on Demographic, Mental Health,
and Self-Control: Unstandardized (Standardized)

	Model 1	Model 2	Model 3
Demographic variables			
Age	0.020 (0.007)	-0.039 (-0.014)	0.044 (0.016)
Female ^a	-0.513 (-0.052)	-0.791 (-0.080)*	-0.791 (-0.080)*
Black ^b	0.181 (0.026)	0.467 (0.066)	0.720 (0.102)**
Hispanic	1.958 (0.115)**	1.493 (0.088)*	1.568 (0.092)**
Multiethnic	1.054 (0.086)*	0.816 (0.067)	0.664 (0.054)
Receipt of welfare	-0.178 (-0.026)	-0.388 (-0.057)	-0.350 (-0.052)
Mental health variables			
Head injury		1.337 (0.155)***	1.350 (0.156)***
Global Severity Index		0.030 (0.315)***	0.005 (0.054)
Mental health diagnosis		0.627 (0.094)	0.483 (0.073)
ADHD		-0.433 (-0.063)	-0.493 (-0.072)
Low self-control			
Self-Control Scale			0.158 (0.384)***
Model R ²	.02	.18	.25

Note: ADHD = attention deficit hyperactivity disorder.

a. Dummy coded with the males as the excluded category.

b. Dummy coded with Whites as the excluded category.

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

lobe damage). Results from the regression model (not shown) with this interaction term were not significant.

Discussion and Conclusion

Gottfredson and Hirschi (1986, 1987, 1988) have been vocal critics of the criminal career paradigm, an area of research that coincidentally dominates contemporary criminology. Based on the current empirical findings, however, it appears that self-control theory holds great promise for the study of high-rate, serious, violent, chronic, and career criminals. Four key findings emerged. First, at the descriptive level, the 72 career criminals scored significantly higher on the Self-Control Scale when compared to 646 noncareer criminals. The effect size was large ($d = .92$), and it provides empirical evidence that mean levels of self-control among career offenders are indeed lower than those of nonhabitual offenders, which is consistent with prior research (e.g., Benson & Moore, 1992; Cauffman, Steinberg, & Piquero, 2005; DeLisi, 2001b; Piquero et al., 2007; Turner & Piquero, 2002; Winfree et al., 2006). Second, among youth who scored one standard deviation above the mean on the Self-Control Scale, there was greater likelihood of career criminal membership, as evidenced by an

odds ratio of 5.36. For the CCI outcome, low self-control was easily the strongest predictor, and it exceeded the predictive capacity of known correlates, such as age, sex, race, ethnicity, socioeconomic status, mental illness, ADHD diagnosis, and trauma experience.

Third, according to ROC–AUC analyses, the baseline self-control measure was moderately able to correctly classify career membership, with 74.4% ($SE = .033$, $p < .001$) AUC sensitivity accuracy. When we examined the sensitivity and specificity of the self-control measure, set at one standard deviation above the mean, the results were even more compelling. Using the cut score of 8.13 on the self-control measure (range = -20.9 to 23.3), the ROC–AUC analyses indicate a sensitivity of 87.4% and a specificity of 48.6%. These results suggest that this measure possesses potential utility as part of a screening device for career criminality. Future research will bear on this point, but it is promising that an offender's score on the Self-Control Scale could be as germane to assessing risk as onset, arrest history, and incarceration history. Fourth, self-control ($\beta = .384$, $p < .001$) was unequivocally the strongest predictor of CCI in the multiple regression analyses, and it accounted for 7% of the total explained variance in the full model.² On the surface, that self-control explained just 7% of the variation in CCI seems to conflict with Gottfredson and Hirschi's strident proclamation (1990) that self-control is the indispensable predictor of crime. Others have similarly found that although self-control is an important correlate of crime and analogous behaviors, it explains relatively low levels of variance (Arneklev, Grasmick, Tittle, & Bursik, 1993; Baron, 2003; Grasmick, Tittle, Bursik, & Arneklev, 1993; Junger & Tremblay, 1999; Sellers, 1999; Vazsonyi, Pickering, Junger, & Hessing, 2001). Perhaps criminologists have interpreted Gottfredson and Hirschi too literally on the explained variance issue. For instance, the 7% explained variance attributable to self-control is 350% greater than the combined predictive power of age, sex, race, ethnicity, and socioeconomic status (as measured by receipt of welfare). Yet no one would argue that these demographic characteristics are unimportant correlates of crime; as such, the same should hold for self-control.

An unresolved conceptual issue pertains to whether self-control and its protean effects can be likened to criminal propensity. There are mixed messages about this in the literature. For instance, Gottfredson and Hirschi (1990) indicated that “theories of crime lead naturally to interest in the propensity of individuals committing criminal acts” (p. 85), which suggests that they equate self-control to criminal propensity. In tests of the theory, criminologists have repeatedly likened self-control to an enduring trait, characteristic, or propensity, and self-control is used as an exemplar of the propensity approach. More recently, Hirschi and Gottfredson (1993) sharply criticized conflating self-control with criminal propensity:

Another advantage to behavioral measures, in our view is that they counter the tendency to translate the control concept at the core of our theory into a personality concept or “an enduring criminal predisposition.” . . . This is the most disappointing tendency in responses to our theory. There may be in our theory an enduring predisposition to

consider the long-term consequences of one's acts, but there is no personality trait predisposing people toward crime. (p. 49)

However, in the next paragraph of their critique, Hirschi and Gottfredson acknowledged that many personality traits (e.g., temper, impulsivity, egocentricity) may be by-products of self-control and can be rightly used to index levels of self-control. Theoretically reconciling these contradictory viewpoints is beyond the purpose of the current study, but it is an important point of clarification for criminological theorists to consider.

We hope that criminologists do not shy away from empirically integrating the self-control construct with criminal career research simply because of the Gottfredson–Hirschi critiques. In doing so, future research can improve on some admitted limitations of the current study. First, the data are cross-sectional, which preclude an assessment of temporal effects. This point is important because Gottfredson and Hirschi (1990) theorize that once established, self-control is relatively stable within individuals across the life course. Empirical tests of this proposition have been mostly supportive (Arneklev, Cochran, & Gainey, 1998; Turner & Piquero, 2002; Winfree et al., 2006). Particularly with a sample of adolescent offenders, it would be worthwhile to see if an individual's low self-control worsened upon incarceration, improved after release, or remained stable. Moreover, it would be interesting to examine whether various subtypes of offenders, such as life-course persistent offenders (Moffitt, 1993), demonstrate lower self-control than that of more normative delinquents, such as adolescence-limited offenders. Second, although the current study group is the Missouri DYS population (or, at least, a close approximation of it), the findings are generalizable for only Whites and Blacks. There were relatively few Hispanic and multiracial offenders, as well as fewer than 100 female youth. Moreover, the prototypical career criminal is a middle-aged male with a decades-long offending career (DeLisi, 2005). Of course, adult samples are needed to assess the effects of self-control among habitual offenders of various adult age groups.

There are voluminous avenues for future research. Whereas the current effort used an index of career criminality (CCI), the effects of self-control can be evaluated separately for various dimensions of the criminal career, such as onset, continuity, and versatility (Elliott, 1994; Piquero & Chung, 2001; Sullivan, McGloin, Pratt, & Piquero, 2006; Wolfgang et al., 1972). Indeed, many exciting research questions can be answered with an explicit focus on integrating self-control and criminal career research. Does self-control predict early onset of antisocial behavior? Do youth with low self-control elicit coercive or abusive treatment from their parents? If so, do these effects coexist with family criminality, concentrated disadvantage, and other variables that affect early life socialization? Do neighborhood characteristics moderate the expression of low self-control, thus demonstrating a relationship between community- and individual-level effects? Were Gottfredson and Hirschi correct to favor a general theory versus a compartmentalized mode of inquiry? Finally, is low self-control an

important piece of the etiological puzzle in explaining why some delinquents develop into pathological criminal offenders?

Notes

1. A reviewer expressed concern that although victimization is part and parcel of career criminality, it is different enough conceptually that it should not be part of the Career Criminality Index (CCI). To empirically examine this concern, all multivariate analyses were rerun with the victimization items removed from the CCI, and there were no substantive changes; that is, all significant relationships remained, and overall differences between both versions of the CCI were negligible. Results for the self-control measure in the logistic regression model revealed an increased odds ratio of 5.45 from 5.36. Incremental variance in the CCI increased from 7.0% to 7.9%. The bivariate correlation between the CCI with victimization items and that without was $r = .96$. The CCI was a slightly more conservative measure with victimization items.

2. Irrespective of the predictive power of self-control to predict career criminal membership, caution should be exercised when it comes to classifying offenders into risk categories that may affect sentencing. We thank a reviewer for this prudent point.

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