THE ROLE OF SELF-CONTROL IN THE DEPRESSION-DELINQUENCY LINK

A Thesis in
Crime, Law and Justice

by
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Abstract

A large body of literature indicates that low self-control is related to crime. Research also suggests that depression is related to delinquency. No prior research has examined low self-control as a possible link between depression and delinquency. Drawing on the self-control literature in criminology and the self-regulation literature in psychology, I examine low self-control as a possible mediator in the depression-delinquency relationship. Conceptualizing self-control as a depletable resource, I posit that adolescents with depressive symptoms have lower amounts of self-control to draw from than adolescents without such symptoms. As a result, adolescents with depressive symptoms are less able to regulate their own behavior, including resisting the temptations of delinquency. Using tobit regression, results suggest that a substantial portion of the relationship between depression and delinquency is accounted for by low self-control.

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Section 1

Introduction

A large body of research indicates that low self-control is a robust predictor of crime and delinquency (Pratt and Cullen 2000). Another sizeable body of research indicates that there is an association between adolescent depressed mood and delinquency, and that depression and delinquency share many of the same risk factors (Akse et al. 2007; Capaldi and Stoolmiller 1999; De Coster and Heimer 2001; McLeod and Kaiser 1993; O'Connor et al. 1998; Quiggle et al. 1992; Siennick 2007; Sigfusdottir et al. 2008). Little, however, is known about why depression and delinquency are linked. Although their co-occurrence is well documented and several explanations have been proposed, the nature of the relationship and why it should exist remains vague. Drawing on the self-control literature in criminology and the self-regulation literature in psychology, I examine low self-control as a possible mediator in the depression-delinquency relationship. Conceptualizing self-control as a depletable resource, I posit that adolescents with depressive symptoms will have lower amounts of self-control to draw from than adolescents without such symptoms. As a result, adolescents with depressive symptoms will be less able to regulate their own behavior, including resisting the temptations of delinquency. If low self-control is found to mediate the relationship between depression and delinquency, our understanding of the co-occurrence between them will be substantially improved.

Section 2

Review of the Literature

The Depression-Delinquency Relationship

Research in psychology and criminology has found that depression and delinquency often coexist in individuals and that these two problems overlap considerably in terms of risk factors
Two types of explanatory mechanisms have been proposed in these literatures to account for the depression-delinquency association in adolescents. The first is a “common antecedents” explanation in which the association between depression and delinquency is viewed as spuriously related to “third variables,” such as poor parenting or rejection by peers. The second is a mutual influence explanation in which depression and delinquency are viewed as influencing each other over time. Under the mutual influence umbrella, three types of associations have been proposed: that delinquency causes depression, that depression causes delinquency and that there is a reciprocal relationship between the two.

**Common Antecedents**

The spuriousness model is based on the premise that depression and delinquency co-occur because they are caused by “non-specific risk factors, which are the basis for separate but related problem behaviors” (Overbeek et al. 2006, p. 11). For instance, Overbeek and colleagues (2006) found support for the common antecedents explanation in the co-occurrence of depressed mood and delinquency for both girls and boys. Results from their community sample of 961 Swedish adolescents indicated that adolescents with one or both problems remained similarly troubled in the second wave of data collection, two years later. The authors suggest their results show that depression and delinquency have separate developmental trajectories because they did not find any unique relationship between the two over a two year period; instead, their co-occurrence was predicted by poor quality parental relationships and low levels of attachment to school.
Akse and her colleagues (2007) results’ suggest that the co-occurrence of adolescent depression and delinquency over time is spurious. They tested this explanation against two mutual influence arguments, that depression causes delinquency and that delinquency causes depression, on a sample of 338 young adolescents in the Netherlands using structural equation modeling. The models of the three possible relationships were so similar that the researchers chose the parsimonious model, which represented the common antecedents explanation.

In another line of research, O’Connor and his colleagues (1998) suggest that a genetic liability explains approximately 45% of the variance in the link between adolescent depression and delinquency, using a sample of 720 siblings. Shared and non-shared environmental factors (e.g. individual personal histories) were also both significant in explaining the variation between the two disorders (O’Connor et al. 1998). All three of these types of variables, a genetic liability and shared and non-shared personal experiences, support a spurious model for the depression-delinquency relationship.

De Coster and Heimer (2001) took an interactionist approach to analyzing a sample of 1,550 adolescents from the National Youth Study (NYS), which was collected from 1977 to 1983 (Elliott et al. 1985). Their results support the common antecedents explanation; they found that “stressful life events, family attachment, and social structural positions” separately predicted both delinquency and depression (De Coster and Heimer 2001, p. 799). De Coster and Heimer interpret the common antecedents explanation using differential social control theory, which is based on the interactionist idea that appraisals by the self and others cause a person to internalize conventional and deviant roles. Specifically in De Coster and Heimer’s work, attachment to family and friends who view an adolescent as depressed or delinquent cause “reflected
appraisals” that result in the adolescent internalizing such views and, over time, taking on a depressed or delinquent role.

**Mutual Influence**

Agnew’s general strain theory suggests a causal relationship between depression and delinquency: depression is a strain which causes individuals to turn to law breaking behavior as a means of coping (Agnew 1985; Agnew and White 1992; Brezina 1996; Brezina 2000). Delinquency can also be an indirect form of coping used to mitigate depression due to a strain (Agnew and White 1992). Brezina (1996) analyzed 1,886 adolescents from the Canadian Youth in Transition Survey which was collected from 1966-1969, to test the associations of strain, depression and delinquency. His results indicate that delinquency reduced the effects of strain on depression cross-sectionally. The strain-by-delinquency interaction term did not reduce depression longitudinally, but this might be due to the size of the time lapse (one year) between waves (Brezina 1996). The effect of strain on depression is unlikely to still exist one year after the strain occurred (Brezina 1996).

In contrast to strain theorists, Hagan (1997) argues that the causal arrow goes the other way: that depression is an outcome of delinquency. Hagan used data on 544 Toronto area adolescents from a twenty-four year period to illustrate a “sleeper effect” of “despair” on delinquents, which did not emerge until midlife. Both structural and cultural mechanisms were invoked to explain why approximately two decades later, individuals with delinquent pasts exhibited depressive symptoms (Hagan 1997). However, this finding pertained only to delinquents who did not finish high school and were unemployed at the time of the survey.

Similarly, Hagan and Foster’s (2003) theory of social stress is based on the notion that stressed individuals who turn to delinquency later become depressed. Using data on 11,506
adolescents from the first two waves of the National Longitudinal Study of Adolescent Health (Add Health), Hagan and Foster found significant gender differences in the effect of delinquency on subsequent depression. Whereas male delinquency was associated with later drinking problems, female delinquency was associated with later depression (Hagan and Foster 2003). Similarly, De Coster and Heimer (2001) tested for mutual influence between delinquency and depression among their adolescent sample and found that delinquency was positively related to depression, but that depression did not predict delinquency.

Recently, Siennick (2007) used Add Health data to explore the depression-delinquency association. Her results indicate that depression in young adulthood is more strongly related to recent offending than prior juvenile delinquency. She also tested several possible mediators in the relationship between recent offending and depression. Of the examined mediators: peer delinquency, years of education, job satisfaction, unemployment, hourly wages and idleness, only educational attainment deficits explained a moderate portion of the offending-depression relationship in young adulthood (Siennick 2007).

Using hierarchical linear modeling (HLM) to analyze a community sample of 241 at-risk boys longitudinally, Beyers and Loeber (2003) found a bidirectional relationship between depression and delinquency, with depressed mood having a stronger effect on delinquency than vice versa. The bidirectional association was stronger in the contemporaneous models than in lagged models. To explain these bidirectional findings, Beyers and Loeber and previously Kaplan and Ziaoru (1994), suggested that depressed adolescents engage in delinquency to minimize their suffering (Beyers and Loeber 2003; Kaplan and Xiaoru 1994). To explain the effect of delinquency on depression, they used Patterson’s (1989) developmental model in which childhood antisocial behavior is viewed as causing low self esteem, academic deficits, and
rejection by peers. These problems in turn lead to depression and association with delinquent peers (Patterson et al. 1989).

In sum, research indicates that delinquency and depression are correlated, but the nature of the relationship remains unclear. Previous explanations range from arguments for a spurious association to a variety of causal explanations. Little consensus has emerged, however, regarding why a relationship should exist between depression and delinquency. Providing an answer to this question is the focus of the current study. Drawing on the psychology literature on self-regulation and the criminology literature on self-control, I examine a new mechanism for understanding the delinquency-depression relationship, low self-control, in a general population sample of adolescents.

**SELF-CONTROL AND SELF-REGULATION**

Gottfredson and Hirschi’s (1990) theory triggered enormous research interest using the one-dimensional trait, self-control, to explain criminal behavior. According to Gottfredson and Hirschi, an individual with low self-control is “impulsive, insensitive, physical, risk-seeking, short-sighted, and nonverbal” (90). Low self-control is caused by poor parenting practices and is established in children around the age of eight, remaining relatively stable from then on across the life course (Gottfredson and Hirschi 1990). Hirschi (2004) recently revised the concept of self-control to be “the tendency to consider the full range of potential costs of a particular act.” Self-control is what aides or inhibits individuals in choosing to participate in a specific act (Hirschi 2004). Crime is one of many risky behaviors associated with low self-control. For example, Gottfredson and Hirschi view cheating, truancy, rollerblade accidents, alcohol use, gambling and sexual promiscuity as rooted in low self-control (Hirschi 2004). For Gottfredson and Hirschi, committing a crime is simple, requires no strategic planning, and individuals with
low self-control are sufficiently motivated to commit crimes. Self-control, however, has not been examined as a possible link in the depression-delinquency relationship.

There are other approaches to conceptualizing self-control than Gottfredson and Hirschi’s theory. Psychologists Roy Baumeister, Mark Muraven and their colleagues view self-regulation (e.g. self-control) as a limited resource in the body that individuals possess to varying degrees (Baumeister et al. 1994). Results from their experiments indicate that after exercising self-control in one activity, individuals exhibited lower levels of self-control in an unrelated follow-up activity (Muraven et al. 2000). They conclude that self-control behaves like a muscle, which when worn down and depleted from exertion, leaves an individual with a smaller resource pool to draw from (Muraven et al. 2000). Other scholars go as far as to suggest that a person should not clean the house before studying for an exam because his/her ability to concentrate will have been greatly reduced by the cleaning (Aamodt and Wang 2008). Individuals whose self-control is depleted may also find it difficult to resist the temptation of immediately appealing activities, such as going out with friends instead of studying for an exam.

Further research by Muraven and Baumeister found the best model of self-regulation to be a “strength model” (Muraven et al. 2000). This research suggests that self-control may be closely intertwined with will power. For example, the dedicated criminology student who studies every evening is building up his self-control by working to obtain his doctorate. Muraven and his colleague’s most recent study provided empirical support for the strength model of self-control. On days that participants experienced situations which demanded more self-control than normal, they were found later in the day to consume larger amounts of alcohol than was normal for them (Muraven et al. 2005). These self-control reductions were recovered
the following day, which led Muraven and his colleagues to suggest that self-control “strength” is recovered while sleeping (2005).

Combining the criminological literature on self-control and the psychological literature on self-regulation provides us with a new framework to approach the study of the depression-delinquency relationship. Together, these two perspectives on self-control suggest that individuals possess varying base levels of self-control and that self-control can be depleted by external factors (Baumeister et al. 1994). Self-control then has two components; the first is that individuals have varying levels of self-control depending on their level of childhood socialization. The second is that current self-control stocks can be depleted by extended use. From this perspective, self-control becomes a depletable, individual level characteristic. Baumeister writes in the introduction to Losing Control, that self-regulation is the key to understanding why people over-spend, over-eat, and engage in other addictive behaviors (Baumeister et al. 1994). I propose that it also may be a factor in the depression-delinquency association.

Section 3

Self-Control: A Link between Depression and Delinquency

Drawing on Baumeister and colleagues’ conceptualization of self-control as a depletable resource, I posit that individuals with depressive symptoms experience chronic depletion of their self-control resources. The main symptoms of depression have been identified as: “depressed mood, feelings of guilt and worthlessness, feelings of helplessness and hopelessness, psychomotor retardation, loss of appetite and sleep disturbance” (Radloff 1977). Together, these symptoms suggest that the inability to self-regulate is an inherent component of depression. Depressed individuals, therefore, should have significantly reduced capacities for self-control.
Adolescents with depressive symptoms labor to accomplish mundane tasks, leaving them with little self-control for behavior regulation in a wide range of life domains. Adolescents suffering from depressive symptoms may be barely functional at times, depending on the level of severity of their symptoms. These kids often must use the majority of their self-control resources to complete daily tasks, such as getting to school on time, doing homework, completing household chores, etc. As a result, their self-control “muscle” may become worn down, leaving them less able to resist temptations, such as delinquency (Muraven et al. 2005).

The average teenager is most likely aware of the long term consequences of engaging in delinquent behavior. Adolescents with depressive symptoms differ though; they exhibit short-term, pessimistic views of life. These negative attitudes cause them to discount the risks associated with delinquent behavior (Nagin and Pogarsky 2004). Teens with depressive symptoms may not be so concerned about getting caught doing something illegal; they may not be optimistic about their chances of attending college, buying a car, or having a family. Moreover, even if they are aware of possible consequences, they may not possess the necessary amount of self-control to resist the temptation of delinquent acts; their self-control “muscle” may not be up to the task (Muraven et al. 2000).

Gottfredson and Hirschi did not identify depression as an outcome of low self-control. Therefore, I draw on Gottfredson and Hirschi’s theory to argue that low-self control is the proximal cause of delinquency, and that, depression is a proximal cause of low self-control. In short, I argue that individuals with depression have reduced amounts of self-regulatory energy, which lowers their self-control, leading them to engage in delinquency.¹

¹To check this specification, I ran models predicting depression with self-control, controlling for prior depression, and the results, although significant, were much weaker than models based on my argument (that depression predicts low self-control).
Section 4

Hypotheses

My first hypothesis is that among adolescents, depression will be a strong, significant predictor of low self-control. Adolescents battling depressive symptoms experience chronic depletion of their self-control resource, leaving them with fewer self-control resources to use in other situations they encounter. Self-control is exerted to complete (and resist) a variety of daily activities (and temptations). If self-control can be depleted by an extra long or unusually stressful day at work (Muraven et al. 2005), then depressive symptoms should also drain an individual’s self-control capacity.

The second hypothesis in this study is that self-control will be a significant mediator in the depression-delinquency relationship. Adolescents exhibiting symptoms of depression are likely to have depleted a great deal of their self-control resource, leaving them with less self-control to resist the temptation to engage in delinquent behavior. I hypothesize that self-control is an important mechanism that explains why depressed adolescents engage in delinquency.

Section 5

Methods

Sample

This study draws its sample from the first two waves of the National Longitudinal Study of Adolescent Health (Add Health). Add Health is a nationally representative sample of adolescents, which began in grades seven through twelve during the 1994-1995 school years. A two-stage stratified design was used to select the sample of 80 high schools and 52 middle schools from the US. Systematic sampling methods were used to ensure this sample is representative of US schools with respect to region of country, urbanicity, school size, school
type, and ethnicity. In Wave I of the data collection, approximately 90,000 students, more than 90% of enrolled students, completed the in-school portion. From the completed in-school surveys, a nationally representative, random sample of about 20,000 adolescents was drawn for the in-home interviews. The in-home interviews lasted about an hour and a half. One parent of the adolescents who participated in the in-home portion was also interviewed for approximately thirty minutes. Approximately 14,000 participants, 88% of Wave I respondents, completed the Wave II in-home interview in 1996. This attrition rate of 12% does not include the 12th graders who were not surveyed in Wave II because the Add Health investigators chose not to track them down.

The final sample size for this study is 14,156 of which 48% were boys and 52% were girls. This sample was determined using list-wise deletion for the dependent and key independent variables (delinquency, depression and self-control) and mean substitution for the control variables. For the variables of interest, delinquency had 1% missing, depression was missing 0.4% and self-control had 2.2% missing. Control variables with the highest amounts of missing data were the vocabulary score (5.1%) and grade point average (4.5%). The remaining variables had less than 3% missing. Flag variables included in the analyses for the vocabulary score and GPA variables were not significant and therefore are not shown in the tables. Multiple imputation using the ICE program in STATA 9.1 was also used to handle missing data. The results using multiple imputation were substantively similar to those using mean substitution. The sample was adjusted for Add Health’s stratified sampling design in order to obtain unbiased estimators and accurate standard errors, using the survey command in STATA 9.1 (Chantala and Tabor 1999).
Adolescence was chosen as the focus of this study because many critical transitions and events occur during this period of life. Moreover, older adolescents experience more depressive symptoms than any other age group (Wight et al. 2004). Depression is also the most common mental health problem among adolescents; it affects 15-40% of the general adolescent population (Hammack et al. 2004).

**Measurement**

**Delinquency**

A summed scale of the number of delinquent behaviors in which respondents engaged during the past twelve months is the main outcome variable in this study (Hindelang 1981). The same eight-item scale was used for both waves of data. Respondents were asked how many times they had damaged property, stolen something worth less than $50, stolen something worth more than $50, broken into a home or building, used a weapon to get something, sold drugs, took part in a group fight, and injured someone so badly they had to see a doctor or nurse. The original responses (zero= never, one= one or two times, two= three or four times, three= five or more times) were recoded into dichotomous variables, with a response of zero indicating the respondent never partook in the specified activity and a score of one indicating participation. The reliability coefficient (alpha) for Wave I is .705 and .699 for Wave II.

**Depression**

Depression was measured in this study using a modified version of the short form of the Center for Epidemiological Studies Depression Scale (CES-D 10) (Radloff 1977). This scale was designed to measure “current level of depressive symptomatology,” not clinical depression (Radloff 1977). These symptoms are used to diagnose clinical depression but may also be associated with other disorders (Radloff 1977). This scale is ideal for the current study because
it was created specifically for use in the general population and subgroups of it, such as
growths and minorities. It has also shown high levels of internal validity, re-test ability, and
reliability across these groups and in the general population for as long as twelve months
(Radloff 1977). Slight differences exist between the CES-D’s questions and Add Health’s,
mainly to make them more applicable to adolescents. Respondents were asked, “How often was
each of the following things true in the past week?” The statements were: You were bothered
by things that don’t usually bother you, you felt depressed, you felt too tired to do things, you
felt hopeful about the future (reverse coded), you felt fearful, you felt happy (reverse coded), you
felt lonely, it was hard to start doing things, you had trouble falling or staying asleep. The items
were coded zero=never, one= sometimes, two =a lot of the time, and three= most of the time,
which is the same coding used by the CES-D 10. Responses to these ten items were averaged to
create an index of depressive symptoms with an alpha coefficient of .726. All of the predictors
in this study were taken from Wave I of the data.

The tenth item in the CES-D 10 overlaps with an item in the measure of self-control,
which is: “You had trouble keeping your mind on what you were doing.” There are nine other
strong indicators of depression, but only three others for self-control, one of which is closely
related to the overlapping variable, so I chose to drop the overlapping item from the depression
scale and keep it in the self-control scale. Additionally, it is not necessary for individuals to
experience all ten symptoms of depression to diagnose them with depression. In contrast,
Gottfredson and Hirschi maintain that their traits of low self-control are nearly all manifested in
individuals with low self-control.

Self-control
A wide variety of methods have been used to measure self-control (Muraven et al. 2000). The self-control scale used here was previously used by Teasdale and Silver (2009) and a similar version can be found in Perrone et al. (2004) and Beaver (2008). Gottfredson and Hirschi (1990) have argued that behavioral measures may give a more accurate assessment of self-control levels than attitudinal measures. This was restated by Hirschi in his 2004 revision. In it, he writes *acts* are much better than *attitudes* at predicting delinquent behavior and the survey he uses to test his revision consists entirely of behavioral measures (my italics). For these reasons, I chose to use behavioral measures as well.

Participants were asked how often they: have trouble getting along with teachers, trouble paying attention in class, trouble getting homework done and trouble keeping your mind on what you were doing. Responses for the first three questions were coded zero = never, one = just a few times, two = about once a week, three = almost every day, and four = everyday, but they were reverse coded so that a high score denotes high levels of self-control. The variable “trouble focusing,” was also reverse coded but is coded only zero to three, because it was taken from a different section of questions. School based measures of self-control similar to those used here have recently been used by Felson and Staff (2006) and Wright et al. (1999), and I control for school attachment and grade point average to ensure that my measure of self-control is independent of school performance. The alpha for this summed scale is .674. Wave III of Add Health was not used for this study because it does not include a comparable measure of self-

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2 I experimented with various other measures, such as “how often do you wear your seat belt, you feel like you do everything just about right, your mother encourages you to be independent, and when making decisions you go with your gut without considering the consequences,” but the alphas for these measures were extremely low. I also tried Perrone et al. (2004) and Beaver (2008)’s measure which adds a question tapping self-centeredness to my indicators, and found similar results to those reported below.

3 Because of the potential link with delinquency, I conducted analyses similar to those reported below after removing the indicator “trouble getting along with teachers” from the self-control measure. The results remained substantively the same.
control.

**Control Variables**

In an attempt to eliminate spuriousness from the model, a variety of controls are needed. Thus, I control for parental monitoring, parental attachment, school attachment, grades, cognitive ability, self esteem, and respondents’ college aspirations in addition to demographic characteristics.

Much research on parental monitoring and parental attachment has illustrated that both have a direct relationship with delinquency and also with self-control (Gibbs et al. 1998; Hay 2001; Hope et al. 2003). Parental monitoring was measured by the sum of six dichotomous (yes=1, no=0) items. Respondents were asked “Do your parents let you make your own decisions about: the people you hang around with, what you wear, the amount of television you watch, the television programs you watch, what time you go to bed on weeknights and what you eat. Alpha for the scale was .63. Parental attachment was measured as the mean of two items: “How much do you think your mom cares about you?” and “How much do you think your dad cares about you?” Responses ranged from one=not at all to five= very much. Alpha for this measure was .526.

By controlling for school attachment and grades in addition to parental attachment, the chance that the results could be affected by social bonds is reduced (Hirschi 1969). School attachment was measured by three questions. Respondents were asked how much they agreed or disagreed with the following statements: “You feel close to people at your school, you feel like you are a part of your school, and you are happy to be at your school.” Higher scores on this scale indicate agreement with these statements. The alpha coefficient for this three item mean scale was .75. Respondents’ self-reported grades in English, history, science and math were
averaged to create a measure of students’ academic achievement, based on a 4.0 scale. Cognitive
ability has been linked to delinquency (Hirschi and Hindelang 1977; Wilson and Hernstein
1985), so I include respondents’ vocabulary scores (PPVT-A), measured by an abridged version
of the Peabody Picture Vocabulary test standardized by age. This test measures both receptive
and verbal cognitive ability.

I measured respondents’ college aspirations using the variable: “how much do you want
to go to college?” This indicator controls for respondents’ stakes in conformity. Depressed
youth may be engaging in delinquency because they have lower stakes in conformity and thus
little regard for the future or consequences of their actions. Responses ranged from 1= low to 5=
high. Self-esteem was measured by constructing a mean scale of six items for which the alpha
was .65. It is necessary to control for self esteem in this study to separate out its effect out from
that of depression. Research indicates that low self-esteem is a risk factor for depression and
also that depressed adolescents exhibit low levels of self-esteem (Lin et al. 2008; Robins et al.
2008). Respondents were asked on a scale of one through five, whether they agree or disagree
with the following statements: you have a lot of good qualities, you like yourself just the way
you are, you feel like you are doing everything just about right, you feel socially accepted, you
feel loved and wanted. The items were recoded so that high scores indicate high self-esteem.

Household socioeconomic status (SES) has been shown to have a relationship with both
delinquency and depression (Hammack et al. 2004; McLeod and Kaiser 1993; Wight et al.
2006). Therefore to avoid any spurious associations, I use parental education as a proxy for
household SES by taking the highest level of educational attainment for the parent and his/her
partner (if they have one). Highest level of education ranged from 0=never went to school to
9=training beyond a four-year college degree.
The majority of research on delinquency concludes that adolescents from two-parent homes are less likely to engage in delinquency than teens from other family types (Simons et al. 2004). Researchers disagree, however, on the relationship between depression and family structure; some studies find that adolescents from two-parent homes are less depressed and others do not find a relationship (Eamon 2002; Wight et al. 2006). Family structure was measured in four categories: two-parent family, step-family, single-parent family and no parents (other-family type). This variable was recoded as a set of dummy variables with two-parent family as the reference group.

Using Add Health data, Wight and his colleagues (2006) found Hispanic, Black and Asian teens experience more depressive symptoms than whites; however other studies have shown mixed results (Hammack et al. 2004; Schraedley et al. 1999). Research on race differences in delinquent behavior have also produced mixed results, therefore it is important to control for race in my analyses. Race was coded as a set of dummy variables, with whites serving as the reference group. Two large bodies of research indicate that adolescent males are more likely to engage in most types of delinquency and that adolescent females experience more depressive symptoms than males (Gottfredson and Hirschi 1990; Hammack et al. 2004; Nolen-Hoeksema and Girgus 1994; Schraedley et al. 1999; Wight et al. 2006). Studies on the age-crime relationship find that delinquency peaks in the mid to late teen years (Hirschi and Gottfredson 1983; Steffensmeier et al. 1989). With respect to age and depression, research indicates that older teens exhibit more depressive symptoms than younger teens (Nolen-Hoeksema and Girgus 1994; Schraedley et al. 1999; Wight et al. 2006). Age and sex are both controlled for in the analyses. Descriptive statistics for all variables in the study are shown below (Table 6-1).
### TABLE 6-1: DESCRIPTIVES

<table>
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<th></th>
<th>Mean</th>
<th>SD</th>
<th>Range</th>
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<td>Self-control II</td>
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<td>0-4</td>
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<td>0-8</td>
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<td>0-8</td>
</tr>
<tr>
<td>Male</td>
<td>0.49</td>
<td>0.50</td>
<td>0-1</td>
</tr>
<tr>
<td>Age</td>
<td>15.35</td>
<td>1.62</td>
<td>11-21</td>
</tr>
<tr>
<td>Household SES</td>
<td>6.15</td>
<td>2.11</td>
<td>0-9</td>
</tr>
<tr>
<td>Two-parent family</td>
<td>0.52</td>
<td>0.50</td>
<td>0-1</td>
</tr>
<tr>
<td>Single-parent family</td>
<td>0.25</td>
<td>0.43</td>
<td>0-1</td>
</tr>
<tr>
<td>Step-family</td>
<td>0.18</td>
<td>0.38</td>
<td>0-1</td>
</tr>
<tr>
<td>Other-family</td>
<td>0.06</td>
<td>0.23</td>
<td>0-1</td>
</tr>
<tr>
<td>White</td>
<td>0.53</td>
<td>0.53</td>
<td>0-1</td>
</tr>
<tr>
<td>Black</td>
<td>0.23</td>
<td>0.42</td>
<td>0-1</td>
</tr>
<tr>
<td>Hispanic</td>
<td>0.17</td>
<td>0.38</td>
<td>0-1</td>
</tr>
<tr>
<td>Asian</td>
<td>0.07</td>
<td>0.26</td>
<td>0-1</td>
</tr>
<tr>
<td>Parental monitoring</td>
<td>3.83</td>
<td>1.26</td>
<td>0-5</td>
</tr>
<tr>
<td>Parental attachment</td>
<td>4.81</td>
<td>0.49</td>
<td>1-5</td>
</tr>
<tr>
<td>School attachment</td>
<td>3.76</td>
<td>0.85</td>
<td>1-5</td>
</tr>
<tr>
<td>Cognitive ability</td>
<td>99.90</td>
<td>14.57</td>
<td>13-146</td>
</tr>
<tr>
<td>GPA</td>
<td>2.77</td>
<td>0.76</td>
<td>1-4</td>
</tr>
<tr>
<td>College aspirations</td>
<td>4.44</td>
<td>1.03</td>
<td>1-5</td>
</tr>
<tr>
<td>Self-esteem</td>
<td>4.11</td>
<td>0.60</td>
<td>1-5</td>
</tr>
</tbody>
</table>

N=14,156

### Methods of Analysis

First, I examine the relationship between depression and self-control using a lagged ordinary least squares (OLS) regression model. I use tobit regression with clustering for the analyses examining the depression-delinquency relationship and self-control as a mediator in the depression-delinquency model. Tobit regression is employed to account for the non-normal distribution of the dependent variable, delinquency, because many respondents have not committed any delinquent acts (Osgood et al. 2002). Tobit censors the respondents with scores of zero, and treats the remaining delinquency scores that are approximately normally distributed.
as continuous. Graphs of the delinquency measure indicate that the identity form is the most normal distribution, therefore it was not transformed. Delinquency at Wave I is included in these models to factor out unmeasured within-person characteristics that may be spuriously related to delinquency and the other variables of interest. With the delinquency measure lagged, these analyses represent a conservative test of the strength and significance of the depression-delinquency relationship.

Section 6

Results

Depression at Wave I and self-control at Wave II have a significant, negative correlation of -.30. The correlation between depression at Wave I and delinquency at Wave II is .12 and is also significant, and the correlation between self-control at Wave I and delinquency at Wave II is -.26. These correlations are consistent with the hypotheses of this study.

The results of the ordinary least squares regression indicate that depression significantly predicts self-control, net of controls (see Table 6-2). These results support my first hypothesis, which is that individuals with depression have reduced amounts of self-control to draw from. Aside from self-control at Wave I, depression has the largest effect on self-control at Wave II in the model. These results also indicate that being male, being from a single-parent family, or other-family type, parental monitoring and cognitive ability are associated with decreased levels of self-control, whereas self-control at Wave I, African American status, Hispanic status,

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4 Analyses (not shown) using self-control to predict depression, controlling for previous depression, were significant, however the effect size was less than half that for depression predicting self-control (shown in Table 6-2), indicating that depression is a stronger predictor of low self-control than the reverse.
parental attachment, school attachment, GPA, college aspirations and self-esteem are associated with increased levels of self-control.\(^5\)

**TABLE 6-2: ORDINARY LEAST SQUARES REGRESSION PREDICTING SELF-CONTROL**

<table>
<thead>
<tr>
<th>Variable</th>
<th>(b) (SE)</th>
<th>(\beta)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression</td>
<td>-0.195 (0.018)**</td>
<td>-0.117</td>
</tr>
<tr>
<td>Prior self-control</td>
<td>0.381 (0.014)**</td>
<td>0.371</td>
</tr>
<tr>
<td>Male</td>
<td>-0.057 (0.014)**</td>
<td>-0.039</td>
</tr>
<tr>
<td>Age</td>
<td>0.007 (0.004)</td>
<td>0.016</td>
</tr>
<tr>
<td>Household SES</td>
<td>-0.004 (0.003)</td>
<td>-0.013</td>
</tr>
<tr>
<td>Single-parent family</td>
<td>-0.025 (0.012)*</td>
<td>-0.015</td>
</tr>
<tr>
<td>Step-family</td>
<td>-0.019 (0.015)</td>
<td>-0.010</td>
</tr>
<tr>
<td>Other-family</td>
<td>-0.061 (0.022)**</td>
<td>-0.019</td>
</tr>
<tr>
<td>Black</td>
<td>0.048 (0.017)**</td>
<td>0.025</td>
</tr>
<tr>
<td>Hispanic</td>
<td>0.038 (0.019)*</td>
<td>0.022</td>
</tr>
<tr>
<td>Asian</td>
<td>0.023 (0.019)</td>
<td>0.008</td>
</tr>
<tr>
<td>Parental monitoring</td>
<td>-0.014 (0.005)**</td>
<td>-0.025</td>
</tr>
<tr>
<td>Parental attachment</td>
<td>0.023 (0.012)*</td>
<td>0.016</td>
</tr>
<tr>
<td>School attachment</td>
<td>0.017 (0.007)**</td>
<td>0.021</td>
</tr>
<tr>
<td>Cognitive ability</td>
<td>-0.002 (0.000)***</td>
<td>-0.044</td>
</tr>
<tr>
<td>GPA</td>
<td>0.058 (0.008)***</td>
<td>0.062</td>
</tr>
<tr>
<td>College aspirations</td>
<td>0.016 (0.007)**</td>
<td>0.022</td>
</tr>
<tr>
<td>Self-esteem</td>
<td>0.037 (0.011)**</td>
<td>0.030</td>
</tr>
<tr>
<td>Constant</td>
<td>1.477 (0.133)***</td>
<td></td>
</tr>
</tbody>
</table>

\(N=14,156\)

\(*p<.05, **p<.01, ***p<.001\)

\(\beta = \) standardized coefficient

\(R^2=29.3\%\)

Results from the lagged delinquency models at Wave II are shown in Table 6-3. The first model indicates that depression significantly predicts delinquency, controlling for prior delinquent behavior and a range of other control variables. Being male, being from a single-parent or step-family, and cognitive ability are associated with increased delinquency in this sample, while age, parental attachment, GPA, college aspirations, and self-esteem are associated with decreased levels of delinquency.

\(^5\) When SES, family structure and cognitive ability are removed from the model, the race results did not change, except when family structure was dropped, the Hispanic coefficient became insignificant (analyses not shown).
The table also shows that when self-control was added to the model, the coefficient for depression was reduced by 70.6% (from .231 to .068). This means that self-control accounts for approximately 71% of the depression-delinquency relationship. In addition to the decrease in magnitude, the effect of depression on delinquency became non-significant when self-control was added to the model.

These results provide strong support for the main hypothesis of this study, that low self-control is an important mediator in the depression-delinquency relationship. The results also indicate that prior delinquency, male status, and being from a single-parent family or step-family increase delinquency with self-control in the model, while age, parental attachment, and GPA decrease delinquency. In sum, these results suggest that self-control is an important explanatory mechanism in the depression-delinquency relationship, which supports my second hypothesis.6

**TABLE 6-3: TOBIT REGRESSION PREDICTING DELINQUENCY AT WAVE II**

<table>
<thead>
<tr>
<th></th>
<th>b</th>
<th>(SE)</th>
<th>β</th>
<th>b</th>
<th>(SE)</th>
<th>β</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression</td>
<td>0.231</td>
<td>(0.068)***</td>
<td>0.035</td>
<td>0.068</td>
<td>(0.077)</td>
<td>0.010</td>
</tr>
<tr>
<td>Self-control</td>
<td>---</td>
<td>---</td>
<td>0.280</td>
<td>-0.292</td>
<td>(0.040)***</td>
<td>-0.072</td>
</tr>
<tr>
<td>Prior delinquency</td>
<td>0.806</td>
<td>(0.020)***</td>
<td>0.105</td>
<td>0.779</td>
<td>(0.020)***</td>
<td>0.271</td>
</tr>
<tr>
<td>Male</td>
<td>0.610</td>
<td>(0.059)***</td>
<td>-0.088</td>
<td>0.581</td>
<td>(0.059)***</td>
<td>0.100</td>
</tr>
<tr>
<td>Age</td>
<td>-0.155</td>
<td>(0.017)*</td>
<td>-0.005</td>
<td>-0.149</td>
<td>(0.017)***</td>
<td>-0.084</td>
</tr>
<tr>
<td>Household SES</td>
<td>-0.007</td>
<td>(0.014)</td>
<td>0.018</td>
<td>-0.012</td>
<td>(0.014)</td>
<td>0.000</td>
</tr>
<tr>
<td>Single parent family</td>
<td>0.117</td>
<td>(0.057)*</td>
<td>0.023</td>
<td>0.118</td>
<td>(0.057)*</td>
<td>0.007</td>
</tr>
<tr>
<td>Step family</td>
<td>0.171</td>
<td>(0.069)*</td>
<td>0.010</td>
<td>0.163</td>
<td>(0.069)*</td>
<td>0.022</td>
</tr>
<tr>
<td>Other family</td>
<td>0.122</td>
<td>(0.101)</td>
<td>-0.007</td>
<td>0.127</td>
<td>(0.099)</td>
<td>0.010</td>
</tr>
<tr>
<td>Black</td>
<td>-0.048</td>
<td>(0.078)</td>
<td>0.009</td>
<td>-0.023</td>
<td>(0.078)</td>
<td>0.019</td>
</tr>
<tr>
<td>Hispanic</td>
<td>0.073</td>
<td>(0.082)</td>
<td>-0.015</td>
<td>0.100</td>
<td>(0.079)</td>
<td>0.013</td>
</tr>
<tr>
<td>Asian</td>
<td>-0.175</td>
<td>(0.092)</td>
<td>0.010</td>
<td>-0.140</td>
<td>(0.092)</td>
<td>0.012</td>
</tr>
<tr>
<td>Parental monitoring</td>
<td>0.023</td>
<td>(0.016)</td>
<td>-0.018</td>
<td>0.015</td>
<td>(0.016)</td>
<td>0.007</td>
</tr>
<tr>
<td>Parental attachment</td>
<td>-0.105</td>
<td>(0.046)*</td>
<td>-0.007</td>
<td>-0.098</td>
<td>(0.046)*</td>
<td>-0.017</td>
</tr>
<tr>
<td>School attachment</td>
<td>-0.022</td>
<td>(0.028)</td>
<td>0.022</td>
<td>0.007</td>
<td>(0.029)</td>
<td>0.002</td>
</tr>
<tr>
<td>Cognitive ability</td>
<td>0.004</td>
<td>(0.002)*</td>
<td>-0.067</td>
<td>0.004</td>
<td>(0.002)</td>
<td>0.018</td>
</tr>
<tr>
<td>GPA</td>
<td>-0.250</td>
<td>(0.036)***</td>
<td>-0.017</td>
<td>-0.185</td>
<td>(0.037)***</td>
<td>-0.050</td>
</tr>
<tr>
<td>College aspirations</td>
<td>-0.050</td>
<td>(0.025)*</td>
<td>-0.022</td>
<td>-0.044</td>
<td>(0.025)</td>
<td>-0.015</td>
</tr>
<tr>
<td>Self-esteem</td>
<td>-0.106</td>
<td>(0.053)*</td>
<td>-0.028</td>
<td>-0.101</td>
<td>(0.053)</td>
<td>-0.021</td>
</tr>
</tbody>
</table>

6 When delinquency was split into property crime and violent crime, the results remained the same.
To test the sensitivity of my results, I split the sample into subgroups by gender, race/ethnicity, and SES (results not shown) and examined the amount of mediation for each group, which can be viewed in Table 6-4. The results indicate that self-control explains 92% of the depression-delinquency relationship for males, 68% for females, 100% for whites and blacks (for these groups the sign of the depression-delinquency relationship changed when self-control was added to the model), 89% for Hispanics, 80% for Asians, 79% for those in the upper half of the SES distribution, and 100% for those in the lower half of the SES distribution. Although the depression-delinquency relationship was not significant for all of these subgroups (due to small sample sizes), the relationship was in all instances positive, and in all instances substantially mediated by self-control.

### TABLE 6-4: MEDIATION FOR SUBGROUPS

<table>
<thead>
<tr>
<th>Sample</th>
<th>b coefficient</th>
<th>P-value</th>
<th>% mediated</th>
<th>Sample size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>0.206</td>
<td>0.019</td>
<td>91.80%</td>
<td>6,922</td>
</tr>
<tr>
<td>Females</td>
<td>0.200</td>
<td>0.021</td>
<td>67.50%</td>
<td>7,308</td>
</tr>
<tr>
<td>White</td>
<td>0.100</td>
<td>0.232</td>
<td>100%</td>
<td>7,557</td>
</tr>
<tr>
<td>Black</td>
<td>0.152</td>
<td>0.237</td>
<td>100%</td>
<td>3,222</td>
</tr>
<tr>
<td>Hispanic</td>
<td>0.249</td>
<td>0.077</td>
<td>89.11%</td>
<td>2,457</td>
</tr>
<tr>
<td>Asian</td>
<td>0.148</td>
<td>0.679</td>
<td>79.70%</td>
<td>994</td>
</tr>
<tr>
<td>High SES</td>
<td>0.256</td>
<td>0.010</td>
<td>78.50%</td>
<td>6,591</td>
</tr>
<tr>
<td>Low SES</td>
<td>0.108</td>
<td>0.188</td>
<td>100%</td>
<td>5,798</td>
</tr>
</tbody>
</table>

Section 7

Conclusion

A substantial amount of research has found an association between depression and delinquency in community, clinical and national samples. Yet the reasoning as to why a
relationship should exist has remained unclear. This study tested a new explanation for the existence of the depression-delinquency association. Specifically, by conceptualizing self-control as a resource which is depleted by symptoms of depression, I hypothesized that adolescents with depressive symptoms experience chronic depletion of their self-control resources, which leaves them with reduced amounts of self-control left over for behavioral regulation, such as refraining from delinquent activities. Consistent with this hypothesis, my results indicate that depression is linked to delinquency through its effect on self-control. When self-control was added to the depression-delinquency model, the relationship between depression and delinquency was mediated 71%, suggesting that low self-control is an important mediating factor in the depression-delinquency relationship.

This study has made several contributions to research on the association between depression and delinquency. First, my results point out a new hypothesis to the delinquency-depression link for future research to explore. Second, my findings bring together two strands of research in criminology which have not previously been associated, research on self-control and delinquency and research on mental health and delinquency. By combining these literatures, this study provides a new direction for criminological research on self-control and mental health. And lastly, my findings suggest that criminologists should continue exploring Baumeister, Muraven and colleagues’ (2000) conceptualization of self-control as a depletable resource, as well as criminologists’ conceptualization of self-control as an individual level characteristic (Gottfredson and Hirschi, 1990; Hirschi 2004).

My results support the idea that there are two components to self-control. The first is that individuals possess different capacities for self-control, which is established in childhood (Gottfredson and Hirschi 1990). The second is that self-control can be depleted by external
factors (Baumeister et al. 1994). Pratt (forthcoming) also stresses this dual aspect of self-control. Depending on their initial levels of self-control, the same challenging circumstances may lead one person to experience severe depletions of self-control that strongly affect behavior while barely affecting another. Depletion of a person’s self-control resources is dependent on the overall amount of self-control a person possesses. Further research is needed to explore the floor and ceiling effects for levels of self-control, that is, the conditions under which self-control can be neither raised nor lowered for an individual. Pratt (forthcoming) suggests that further investigation into Baumeister and his colleagues’ work on resource depletion is needed to revise and revitalize self-control theory. The current study adds to this growing body of research, which, according to Pratt (forthcoming, p.17) “may represent the next generation of self-control research in criminology.”

The results in this study can be considered conservative because Add Health is a school-based survey. Therefore adolescents with very low self-control or severe depression may not be attending school and may therefore be missing from the sample. If these individuals were in the sample, allowing for a wider range of variation in the key measures, stronger associations between the key measures of interest may have been observed. Future research should explore self-control as a mediator in the depression-delinquency relationship using samples that include high school dropouts.

The findings of this study indicate that self-control may be an important factor in preventing depressed adolescents from becoming delinquent. For example, depressed individuals with limited self-regulation abilities and little regard for the future are unlikely to respond to “get tough” policies that emphasize increased penalties for delinquency. Instead,

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7 A dropout indicator for adolescents who dropped out of school between waves I and II was included in the analyses. The indicator was not significant and therefore not shown in the tables.
such individuals may be better served by interventions aimed at helping them to improve their capacity to self-regulate, including avoiding situations with delinquent opportunities. More research, however, is needed before any definitive recommendations can be made.
Bibliography

Chantala, Kim, and Joyce Tabor. 1999. "Strategies to Perform a Design-Based Analysis Using the Add Health Data." Carolina Population Center, University of North Carolina at Chapel Hill.


