Graduate Theses and Dissertations   Graduate School

10-30-2009

The Roles of Social Bonds, Personality, and Rational Decision-Making: An Empirical Investigation into Hirschi's "New" Control Theory

Jonathan Intravia
University of South Florida

The Roles of Social Bonds, Personality, and Rational Decision-Making:

An Empirical Investigation into Hirschi's "New" Control Theory

by

Jonathan Intravia

A thesis submitted in partial fulfillment
of the requirements for the degree of
Master of Arts
Department of Criminology
College of Behavioral and Community Sciences
University of South Florida

Major Professor: Shayne Jones, Ph.D.
Christine Sellers, Ph.D.
Richard Newel, Ph.D.

Date of Approval:
October 30, 2009

ACKNOWLEDGEMENTS

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

THE ROLES OF SOCIAL BONDS, PERSONALITY, AND RATIONAL DECISION-MAKING: AN EMPIRICAL INVESTIGATION INTO HIRSCHI'S "NEW" CONTROL THEORY

JONATHAN INTRAVIA

ABSTRACT

Control theories have substantively contributed both theoretically and empirically to criminological research. Recently, Hirschi moved away from the personality constructs associated with self-control and created a new conceptualization that favors social bonds. Specifically, Hirschi suggests that counting the number of inhibitors (derived from social bonds) is the best way to predict delinquency. Using middle school and high school students from Largo Florida, this study examines Hirschi's new conceptualization of inhibitors by comparing it with self-control and a traditional social bonding scale. In addition, this study also explores whether Hirschi's new conceptualization and self-control operate through a cognitive scale. Results suggest that some components of Hirschi's new conceptualization of inhibitors are supported, while others are not. Finally, limitations are discussed and directions for future research are outlined.

CHAPTER 1

INTRODUCTION

Control theories are among the most frequently researched and cited perspectives in criminology (Cohn, Farrington, and Wright 1998; Vold, Bernard, and Snipes 2002). Travis Hirschi, the most prominent and influential control theorist, is known for his (1969) work on social bonds that superseded earlier versions of control theories from Reiss (1951) and Nye (1958). Specified as social control theory, later known as social bonding theory, Hirschi's (1969) theory revolves around the idea that delinquency occurs when an individual's bond to society becomes either weak or broken. Individuals who have stronger attachment, commitment, involvement, and belief are less likely to commit delinquent acts. Moving away from social bonding theory, Gottfredson and Hirschi's (1990) self-control theory is currently one of the most cited theories (Wright, 2000; Cohn & Farrington, 1999) and has also generated a significant amount of empirical attention (Pratt and Cullen, 2000; Sampson and Laub, 1993; Tittle, 1991). Self-control is based on six interrelated elements, and individuals who lack self-control tend to be more impulsive, insensitive, physical (as opposed to mental), risk-taking, short-sighted, and nonverbal, resulting in a higher likelihood of engaging in criminal and analogous acts.

Recently, Hirschi (2004) has moved away from self-control and back to social bonding theory. Stemming from problems associated with self-control, Hirschi returned to the four elements found in social bonding theory. By changing the definition of self-control to now consider the full range of potential costs of a particular act, Hirschi

indicates that both self-control and social bond theories are the same. In operationalizing the new conceptualized self-control, Hirschi suggests the best measure would be counting the number of inhibitors (social bonds) that deter individuals from committing criminal and analogous behavior.

Although Hirschi's previous theories (social bonding and self-control) have received a great amount of attention empirically, his new conceptualization has not been widely tested. One study (Piquero and Bouffard, 2007) found that attitudinal self-control and social bonds were not significantly related to delinquency after including their new self-control scale. In contrast, another study (Higgins, Wolfe, and Marcum 2008) found attitudinal self-control, social bonds, and the new self-control scale to be significantly related to delinquency. However, it is unclear whether these two studies accurately operationalized the new control theory. Moreover, these studies arrived at contradicting conclusions. Therefore, more research is necessary to test Hirschi's most recent control theory.

In this study, accurately recreating Hirschi's new self-control scale using inhibitors (bonds) is attempted. By doing this, a more robust and precise measure will help test Hirschi's new conceptualization with his preceding control theories. In addition, previous empirical inconsistencies with Hirschi's new self-control are addressed. Also, since inhibitors (bonds) in new self-control are related with rational choice models, this study explicitly assesses whether elements of rational choice theory mediate the effects of both inhibitors and self-control. Using a sample of middle school and high school students (N=1675), this study examines the relationship between attitudinal self-control, traditional social bonds, new conceptualization of inhibitors, and perceived costs with a

2

delinquency scale. Utilizing similar measures and scales from Hirschi (2004), social bonding theory (Hirschi, 1969), and the Grasmick et al. scale (1993), this study will clarify whether Hirschi's new conceptualization of inhibitors is any different than the traditional way social bonds have been conceptualized, and also its independent effect on self-control. In addition, this study also attempts to fill a void in the literature by including an individual's rational calculations of their costs to examine whether self-control and/or Hirschi's (2004) new conceptualization of inhibitors is mediated by a cognitive scale.

In the subsequent chapters, the evolution of control theories will be discussed, followed by a detailed discussion that focuses on the background and previous literature on Hirschi's social bond and self-control theories. This will be followed by Hirschi's new self-control theory, and the areas that need to be addressed to better understand this reconceptualization. Following this, the methods section will discuss the sample, variables, and operationalization that will be employed in this study. Lastly, the final chapters will discuss the results of the study, followed by the limitations and directions for future research regarding Hirschi's new self-control theory.

CHAPTER 2

BACKGROUND

EARLY CONTROL THEORIES

Social control theories differ from other criminological theories. Rather than examining why individuals commit crime, control theories examine why individuals do not commit crime. That is, control theories focus on factors that inhibit one from engaging in crime and delinquency, and assume the motivation for deviant behavior exists within all individuals. Early control theorists such as Albert J. Reiss (1951) and F. Ivan Nye (1958) focused on internal and external controls. Reiss (1951) established one of the earliest concepts in control theory with "personal" and "social" controls as causes of delinquent recidivism. Personal controls refer to how well an individual refrains from behavior that conflict with the norms and rules of society. An individual with stronger personal control is more likely to have non-delinquent social roles and control over their behaviors. Social controls refer to how social groups and institutions make norms effective in rules that an individual will follow. Reiss emphasized that primary groups, such as institutions and communities, are major sources of a person's social control. These institutions and groups can be found in the form of family and schools where both can establish and reinforce non-delinquent behavior. This is done by the family establishing themselves into a community and accepting the norms of the surrounding institutions, and by the school controlling the attendance of a child to develop and strengthen rational controls.

Nye (1958) expanded upon Reiss' (1951) notions by identifying three unique patterns of attitude and behavior: (1) direct control, (2) internalized control, and (3) indirect control. Direct control, shaped by rewards and punishments, occurs when a penalty is assured and delivered for deviant behavior. Internal control, exercised through an individual's conscience, inhibits delinquent behavior. However, lack of internal control may also be the result of the child not agreeing with the conforming models provided by parents. Indirect control is related to an individual's relationship with family and non-delinquent people. An individual who has positive feelings towards their parents or prosocial others has stronger indirect control, in contrast to having weaker indirect control if their feelings are negative. Nye also noted that the most important factor in influencing social control is the family.

Similar to internal and external controls found in the theories proposed by Reiss (1951) and Nye (1958) are concepts in Reckless's Containment Theory (1956; 1957; 1961; 1967). Walter Reckless proposed a theory based on inner and outer containments that counteract factors that may cause delinquency, such as "pushes" and "pulls". Inner containment, developed around age 12 within the family, focuses on individuals developing positive traits on certain components, which include self-concepts, goal orientation, frustration tolerance, responsibility, and retention of norms (1967, p. 476). Outer containment assumes that individuals are presented with a set of norms and institutional reinforcement of norms, goals, and expectations. In addition, these individuals have strong social relationships with parents, teachers, and their communities that aid in supervising and punishing behavior. However, when containment is weak and the motivation to deviate is strong, deviance is more likely to occur through "pushes" and

"pulls". Pushes include discontent with living conditions, biological factors, and lack of opportunities for advancement. Pulls include delinquent peers, groups, and subcultures, temptations, distractions, and deviance patterns. According to Reckless, all individuals in delinquent-prone areas have opportunities to deviate; however, individuals with stronger containments are insulated against the pressures of delinquency (pushes and pulls).

Although not originally presented as control theories, Gresham Sykes and David Matza's techniques of neutralization (1957) and David Matza's principles in *Delinquency and Drift* (1964) have usually been classified as one. Originally, Sykes and Matza's proposed techniques of neutralizations, which is when individuals temporary suspend the appropriateness of norms by developing rationalizations and excuses favorable to commit delinquent acts. Extending from his earlier work on techniques of neutralization, Matza's drift theory suggests individuals used neutralization to "drift" in and out of delinquent behavior, taking temporary breaks from conventional moral restraints. These ideas on neutralization and drift share similarities to components found in rational choice theory, specifically the cognitive process involved in whether to commit delinquency. Individuals rationalize their behaviors to be excused and "free" to commit delinquent acts during neutralization, which minimizes the consequences of the costs. Thus, individuals drift in and out of delinquency when they neutralize the negative consequences of their antisocial behavior. This cognitive component of control theories, in which some form of rationalization is important, is also evident in the most well-known and widely studied control theories – Hirschi's (1969) social bonding theory.

SOCIAL BONDING THEORY

Although earlier control theories had an impact on criminological theory and research, Travis Hirschi is considered to have made the most substantive contributions to control theories. His seminal work, *Causes of Delinquency* (1969), examined what inhibited youth from committing delinquent behavior. Hirschi resisted personality explanations and moved away from previous perspectives (Reiss, 1951; Nye, 1958), which used controls that corresponded with an individual's conscience. In contrast, Hirschi focused on controls relating to personal and social aspects of an individual to more accurately explain the change and variation in their behavior. The major premise of his work suggested that delinquency occurs when an individual's bond to society is weak and/or broken. The bond is composed of four elements that include: (1) attachment; (2) involvement; (3) belief; and (4) commitment. The stronger these elements of the bond are, the more likely an individual will be inhibited from delinquent activities. In contrast, the weaker the four elements are, the more likely an individual will commit a delinquent act. Given that Hirschi's social bonding theory has held such prominence in criminology, a more thorough explication of his theory is warranted. The following sections will describe the elements further in depth.

Attachment refers to relationships with significant others. An individual with a strong attachment cares about others' expectations; therefore, they are closer to them, admire them more, and also relate to them. Attachment to parents, school, and peers will inhibit an individual from delinquency because an individual will take their relationship with others into consideration before committing a delinquent act. A healthy relationship between parents and their child is important in controlling and monitoring delinquency.

In addition, Hirschi claims that strong attachment to peers can inhibit an individual from engaging in delinquency. Hirschi also highlights that whether an individual's parents or peers are delinquent, they are less likely to become delinquent if their attachment to them is strong. In addition, Hirschi emphasized that attachment to school is important. An attachment to school and teachers will help prevent an individual from engaging in delinquency by weighing potential consequences. Similar to parents and peers, if an individual does not care about their relationship with school, they are less likely to conform to the rules of society, which will result in a higher chance of delinquency.

If an individual is too busy, occupied, or restrained due to being actively involved in conventional activities, they are less likely to find the time to deviate. In contrast, if a youth feels like "he has nothing he wishes to do," the more likely he is to deviate (Hirschi, 1969; p. 193). These activities may include sports, school-related activities, family activities, and religious activities. Hirschi (1969) recognizes that delinquency is not time consuming; however, what Hirschi is expressing is that the more a youth's time is consumed, the less time they will have to commit a delinquent act.

The element of belief suggests that individuals will not violate laws in which they believe and respect. Rules are constructed from societal laws and norms, and also from parental socialization. If an individual generally agrees with society's rules and laws, and finds them to be fair, they are less likely to engage in behavior that contradicts them (e.g., delinquency). In addition, belief can be related to rules generated by parents. If a youth does not believe and comply with rules that are given to them, they are more susceptible to delinquency.

Commitment to conventional activities refers to an investment that an individual will not want to risk losing by engaging in delinquency. These include educational and occupational commitments. An investment built in these conventional activities inhibits youths from delinquency because they do not want to jeopardize what they have acquired. Hirschi's bonds, especially commitment, are similar to concepts of rational choice theory. This perspective believes individuals will make rational decisions based on maximizing their profits or benefits and minimizing their costs or losses. Because the individual will weigh the pros and cons of delinquency vis-à-vis their commitments, this element of the social bond is considered to be the rational choice component.

Empirical Status of Social Bonding Theory

Hirschi's (1969) research with a male juvenile sample showed support for his theory. As his main argument suggests, the weaker the bonds an individual possesses, the higher the likelihood of delinquency. Except for involvement, he found all elements to support his hypothesis. All the elements of the bond have been measured extensively throughout the past four decades across an array of analogous and delinquent behavior. Results both favor and disfavor Hirschi's original research.

The equivocal support for the theory is illustrated well by the empirical findings related to the element of attachment. Krohn and Massey (1980) examined minor and serious drug use and delinquent behavior with a large adolescent sample and found that attachment was consistently the weakest of the elements. Robert Agnew (1991) found that attachment was not related to delinquency, but later found (1993) that all elements of the bond (including attachment), mediated by anger and frustration, were moderately related to delinquency. Conger (1976) also found support for the attachment element,

although a fuller explanation of delinquency was provided when combining this perspective with social learning theory. Junger-Tas (1992) reported that juveniles are more likely to respond with delinquency when parental bonds are weak and family functioning is poor, both of which suggest weak familial attachment. In contrast, juveniles are less likely to commit delinquent acts when they have strong bonds and good functioning in the family. When comparing whether attachment to straight or drug-using parents inhibits children's drug use, Jensen and Brownfield (1983) arrived at an interesting conclusion. In support of Hirschi (1969), they found that when a child is attached to a straight (non-drug using) parent, they are less likely to use drugs themselves. However, in contrast to Hirschi's predictions, attachment to drug using parents had no significant effect on inhibiting drug use in the child.

Hirschi (1969) suggested that the more attached an individual is with others, the less likely they will be delinquent. However, this also includes attachment to delinquent peers, which becomes a more complicated issue. To make sense of this, Hirschi expressed that individuals are usually attached to peers who hold similar interests and often engage in similar behaviors. For instance, if a juvenile enjoys participating in sports, they are more likely to seek out other individuals who hold the same interests. The element of attachment and its association with peers is related to the concept of homophily. Meaning "love of the same," homophily is the notion that individuals associate and engage with others who are similar.

The role of peers in Hirschi's social bonding theory has raised a great amount of attention with other theoretical frameworks, such as Akers' (1973) social learning theory, which suggests that delinquency is positively related to the number of deviant peers one

has acquired. Conger (1976) explored attachment with delinquent peers and found

support for social learning theory over social bonding theory in a longitudinal analysis. In

measuring the average number of delinquent acts committed, it was found that the overall

average increased when the number of delinquent friends increased and stakes in

conformity remain relatively low. "Delinquency will be greatest where attachments to

conventional environments are weak and attachments to deviant environments are strong"

(Conger, 1976, p. 29). Taking a different approach, Marcos et al. (1986) examined

adolescent drug use with social control and differential association theories. They found

that the highest correlation of an individual's drug use is peers who used drugs. In

addition, they also concluded that the predominant influence on juvenile drug use, across

all types of drugs measured, was being associated with drug-using peers. Similar

conclusions on smoking and peers who smoke were found by Massey and Krohn (1986).

Speaking more definitively on the issue of attachment to delinquent peers,

Matsueda and Anderson (1998) examined both social learning and social bonding

theories in an attempt to explain the reciprocal relationships between delinquent behavior

and delinquent peer associations. Using the National Youth Survey, they found support

for both control and social learning theories, and most importantly, they also noted

evidence of a reciprocal relationship between delinquent peer associations and behavior.

The results suggest that the effect of delinquency on peer associations is significantly

larger than the effect of peer associations on delinquency. That is, delinquency preceded

and predicted delinquent peer association, although such associations did contribute to

further delinquency. This specific finding, similar to the notion of homophily, is

supportive of the explanation provided by control theories and social learning theory.

Similar to attachment, empirical findings related to the element of involvement suggest mixed support for Hirschi's (1969) predictions. The element of involvement has been empirically measured using various institutions, including school, religion, and family. Previous research has found involvement to hold less importance than the other elements of the bond (Longshore, Chang, Hsieh, and Messina 2004; Durkin, Wolfe, and Clark 1999; Jenkins, 1997; De Li, 2004). In one study (Hoffman and Xu 2002), higher involvement among black students actually resulted in higher rates of delinquency. In contrast, Wong (2005) examined 578 fifth through twelfth graders on nine involvement activities across violent, property, and trivial offenses, and found that school and family related activities reduced delinquency. McNeal (1995) examined high school students involved in athletics, fine arts clubs, academic clubs, and vocational clubs. He found that participation in sports significantly reduced dropout rates, whereas fine arts, academic, and vocational clubs had no major effect.

Perhaps some of the discrepant findings relating to involvement are due to the ambiguous nature of this element. That is, involvement may overlap with commitment. Krohn and Massey (1980) combined commitment and involvement into one element. They believe commitment falls under the temporal dimension of involvement, because an individual that is committed to a specific activity also participates in that activity. In contrast, they find it difficult for an individual to be involved in an activity with which they are not committed or committed to an activity without devoting proper time. Amongst 3,065 students, they found that commitment (which also included involvement) demonstrated the strongest effect; it was significantly and negatively related to various minor and serious delinquent acts, except with minor substance use. Krohn, Massey,

Skinner, and Laurer (1983) found similar results for adolescent cigarette smoking in a different sample. Specifically, commitment to education had one of the strongest effects in restraining an individual from smoking (see also Massey and Krohn, 1986). In another study that focused on drunk driving among college students, individuals who had a stronger commitment to their education and had higher grade point averages were less likely to drink and drive (Durkin, Wolfe, and May 2007). Similar findings were noted when the dependent variable was binge drinking (Durkin et al. 1999). Thus, the findings regarding commitment appear to offer more consistency than those related to attachment.

Lastly, there are also mixed findings in the extant literature when exploring the role of beliefs. Massey and Krohn (1986), in a longitudinal analysis, measured belief by a scale that included such items as abiding by the law, legitimacy of parental rules, and whether people should obey the law for purchasing cigarettes for underage smokers. They found that belief did not have a direct effect on smoking, but rather an indirect effect through differential association only in their last year of the study (noted as Time 3 in their research). Baier and Wright (2001) performed a meta-analysis on religious beliefs and crime using 60 previous studies. They used studies that measured both attitudinal (belief in God, Jesus, the devil, and importance of religion) and behavioral beliefs (religious involvement and prayer) and found that both had a significant, moderate effect on inhibiting crime. Belief has also been shown to be related to drunk driving (Durkin et al. 2007), adolescent cigarette smoking (Krohn at al. 1983), and minor and serious drug use and delinquency (Krohn and Massey, 1980).

In summary, although there are some contradictory findings, there is empirical support in the extant literature on Hirschi's social bonding theory. Despite the weakest

support found in familial attachment (Krohn and Massey, 1980; Agnew, 1991), there remains sufficient evidence to indicate this element matters, especially with respect to familial interactions (Loeber and Stouthamer-Loeber, 1986). The other elements, which include involvement, commitment, and belief more consistently found support with various analogous and delinquent and analogous noncriminal acts. Thus, although some empirical findings argue that relationships with these elements are better supported when other perspectives are combined, there is enough support to conclude that these elements are significant factors by themselves.

SELF-CONTROL THEORY

Moving away from social control theory, Travis Hirschi, along with Michael Gottfredson proposed a new control theory to explain delinquency. In *Causes of Delinquency* (1969), Hirschi denoted four elements that create a social bond developed from personal or social aspects of the individual. However, in *A General Theory of Crime* (1990)*, also referred to as self-control theory, the focus is on explaining the variation of criminal behavior through only one type of control; an internal form of control known as self-control.

The main premise of self-control theory is that individuals who possess higher self-control are less likely to engage in criminal behavior; however, individuals with low self-control are more susceptible to pursue criminality and imprudent behavior such as "smoking, drinking, use of drugs, gambling, having children out of wedlock, and engaging in illicit sex" (Gottfredson and Hirschi, 1990; p. 90). Therefore, self-control can be applied to all types of criminal and noncriminal, analogous behavior at all times. In addition, self-control is purportedly a characteristic that can explain all acts of crime and

deviance, for all individuals (regardless of race, class, and gender). According to Gottfredson and Hirschi, all criminals will be versatile, committing a variety of criminal and analogous acts.

There are six interrelated elements of self-control. First, individuals with low self-control are impulsive. These individuals have a "here and now" orientation, and a preference for immediate gratification. In contrast, individuals with high self-control have the ability to defer gratification. Second, individuals with low self-control prefer easy or simple gratifications. "Crime and analogous behaviors provide money without work, sex without courtship, and revenge without court delays" (Gottfredson and Hirschi, 1990; p. 89). Conversely, individuals with high self-control possess traits such as diligence, tenacity, or persistence. Third, people with low self-control seek excitement, risk, and thrills. They tend to be adventurous, active, and physical. On the contrary, people with high self-control are more cautious, cognitive, and verbal (Gottfredson and Hirschi, 1990; p. 89). Fourth, individuals with low self-control tend to be short-sighted. They prefer arrangements with short-term benefits over long-term commitments. On the contrary, individuals with higher self-control tend to be interested and prepared for commitments such as jobs, marriage, and family/friends (Gottfredson and Hirschi, 1990; p. 89). Fifth, individuals low in self-control lack cognitive and academic abilities; therefore, individuals low in self-control prefer activities that require minimal skill and planning (including crime). Individuals with high self-control may possess manual skills and value cognitive and academic abilities. Finally, individuals who have low self-control are insensitive to others. They are inclined to be self-centered and indifferent to the suffering and needs of others (Gottfredson and Hirschi, 1990; p. 89). Those who do not lack self-

control are more likely to be sensitive and generous to others. The six elements of self-control coalesce into the latent construct self-control.

To understand the connection among these traits, it is important to explore the underlying assumptions of self-control theory. In harmony with all control theories, human nature is seen as hedonistic and self-serving. Thus, all individuals are born without self-control; therefore, self-control is created through effective child-rearing practices from parents. "Affectionate parents create self-control by establishing a reciprocal bond between parent and child" (Cullen, Wright, and Blevins, 2006; p. 89), allowing parenting to restrain impulsive behavior in children and scrutinize the consequences of their acts. There are three minimum conditions necessary for proper child-rearing in order to teach children self-control and instill traits (premeditative, diligent, cautious, committed, cognitive, and generous) opposite of the six elements found in individuals with low self-control. Parents must monitor the child's behavior; they must recognize deviant behavior when it is happening; and, they must punish deviant behavior when it occurs. More simply, the child will possess the capability of delaying gratification, will be unlikely to use force or violence, will be more sensitive to others, and more willing to accept responsibility for their actions if socialized appropriately. This process can be thwarted in several ways. First, the parents may not care for the child; second, even if they care, the parents may not have the time to monitor their child; third, even if they care and monitor, the parents may see nothing wrong with their child's behaviors; and finally, with everything else in effect, the parents may not be willing to implement fair punishment when misbehavior occurs (Gottfredson and Hirschi, 1990; p. 98). In addition, effective socialization is thwarted by excessive punishment

(physical pain and verbal aggression; Hirschi and Gottfredson, 2003). In contrast, individuals who experience fair, non-violent punishment are less likely to become future offenders.

Self-control is either developed or not developed early in a child's life, and once developed, it remains stable throughout the individual's life. For example, if an individual was impulsive as a child, the individual would exhibit the same traits as an adult. With this stability assumption of self-control, the best predictor of criminal behavior is prior criminal behavior. Further, the differences in an individual's level of self-control will not change as a function of the influence of new peers, family, and most other sources of socialization.

As previously noted, the family is imperative for instilling self-control in children; however, children are often away from home, and the school may offer many advantages that are important for child-rearing. A socialization institution such as school can more effectively monitor behavior of children than the family can, and teachers generally have no difficulty recognizing deviant behavior (Gottfredson and Hirschi, 1990). Although the school may have some effect on instilling self-control, it may also be quite limited. Specifically, schools work in conjunction with families, and if the aforementioned familial characteristics are lacking, the school may not be a powerful enough institution to fill this void.

Measurement of Self-Control

In a thorough examination of the extant empirical research on self-control theory, Pratt and Cullen (2000) conducted a meta-analysis of 94 studies. Of these studies, 82 used an attitudinal measure of self-control and 12 studies utilized a behavioral measure of

self-control. On average, they found that 19.3 percent of the variance in delinquent and criminal behavior was explained by self-control. In addition, they also found that self-control is not the only cause of delinquent and criminal behavior. Studies including social learning variables combined with self-control explained 15.3 percent more variation in criminal behavior than studies that did not control for variables from social learning theory.

Beyond the issue of whether self-control is the sole cause of criminal behavior, one of the most debatable arguments involves measuring self-control. Hirschi and Gottfredson (1993) prefer using behavioral approaches rather than attitudinal scales to measure self-control, stating "the best indicators of self-control are the acts we use self-control to explain: criminal, delinquent, and reckless acts" (1993, p. 49). They believe an individual's self-control affects how they respond to surveys, resulting in less valid responses than behavioral measures. This argument was later investigated in Piquero et al's (2000) examination of whether self-control affects self-reported survey responses. Using an item response theory (IRT) model, they found the Grasmick et al. (1993) scale provoked different answers from the participants based on their level of self-control. This finding is supportive of Gottfredson and Hirschi's hypothesis that an individual's level of self-control influences survey responses.

When measuring self-control with behaviors, a few studies used different approaches that are specifically appealing. Keane, Maxim, and Teevan (1993) examined driving under the influence (DUI) from individuals' blood alcohol concentration (BAC) with low self-control behaviors. Using secondary analysis from the 1986 Ontario Survey of Nighttime Drivers, the civilian Ministry of Transportation personnel administered a

short survey and examined BAC levels against their predictor variables. They operationalized low self-control by examining risk taking, impulsiveness, and pleasure seeking behaviors to measure seat belt use, perceived likelihood of being stopped by police while driving intoxicated, being discouraged to drive after drinking, belief they are over the legal limit to drive, and the number of alcoholic drinks consumed in the previous seven days. They found that measures of risk taking (failure to wear a seatbelt and number of drinks consumed in the previous seven days) had positive and significant effects on an individual's BAC level. In addition, they found higher BAC levels among individuals who believed they were over the legal limit and who were also discouraged to drive. This is an important finding because risk taking and impulsive behaviors that are related to drinking and driving significantly predict driving under the influence of alcohol.

In another study, Benda (2005) used behaviors to measure self-control. Using 3,335 high school students as his sample, he examined self-reported behaviors that included tobacco use, threatened/harassed someone, driving without wearing a seatbelt, been involved in reckless driving, responsible for an automobile accident, skipped school, engaged in unprotected sex, shared needles, and had more than two sexual partners in the previous year. He found that these behavioral measures of self-control were positive predictors of drug use, property offenses and person offenses. Using data from the Cambridge Study in Delinquent Development, Paternoster and Brame (1998) used behavioral indicators of self-control to predict involvement of males (ages 8-9) in criminal and analogous behavior. They found that self-control is empirically associated with both criminal and analogous behavior, and strength of association between both

types of behavior was nearly equal. Behavioral measures such as smoking and drinking

(LaGrange and Silverman 1999) and fraudulent behavior (Smith 2004) have also shown

to be significant predictors explaining criminal behaviors.

Empirically, behavioral measures have supported self-control theory (Keane et al.

1993, Benda 2005); however, using this method creates a tautological issue suggesting

that low self-control causes low self-control. Akers (1991) suggests that there needs to be

independent indicators of self-control to avoid the issue of tautology within the theory. In

response to Akers's suggestions, Hirschi and Gottfredson (1993, p. 53) identified

independent indicators that are not criminal. These include whining, pushing, smoking,

drinking, excessive television watching, having difficulties in relationships, accidents,

and employment instability as measures that avoid tautology issues within self-control

theory.

In addition to using behaviors to measure self-control, another popular method of

operationalizing self-control is attitudinal measures derived from personality scales. One

of the most recognized and used measures is the Grasmick et al. (1993) scale, which

consists of 24 items that tap into all six components of self-control. This scale is

measured using a Likert-style system (varying from strongly agree to strongly disagree)

that represents whether an individual has low self-control. Further, unlike behavioral

measures, attitudinal scales do not refer to any specific deviant behavior, thus avoiding

the tautology issue. Using their 24-item scale, Grasmick et al. (1993) found that the

elements of self-control formed a unidimensional trait and significantly predicted

criminal acts. In addition, Cochran, Chamlin, Sellers, Wilkerson, and Wood (1998) used

confirmatory factor analyses and found evidence of unidimensionality for five out of six

components of low self-control. All the components besides "prefer physical over verbal solutions to problems (physical)" had loadings at 0.50 or higher on the factor.

Similar to results of behavioral measures on self-control, studies that used the Grasmick et al. (1993) scale have found it to be useful in explaining various criminal and analogous behaviors. Love (2003) established that self-control is a significant predictor of illicit sexual behaviors and crimes. Gibson et al. (2004) found that self-control was important in predicting both binge drinking and alcohol related behaviors. Further, empirical findings have shown support for the Grasmick et al. scale to significantly explain violent and drug offenses (LaGrange and Silverman, 1999), intimate partner violence (Sellers, 1999), academic dishonesty (Smith, 2004), software pirating (Higgins 2004), employee theft (Langton, Piquero, and Hollinger 2006), and antisocial and risky behaviors (Jones and Quisenberry 2004).

In determining whether behavioral or cognitive measures are better predictors of self-control, Pratt and Cullen (2000) presented a meta-analysis of the empirical status of self-control and found that all types of measures were sufficient predictors of delinquency and analogous behavior. In addition, they found the average relationship with criminality between attitudinal and behavioral measures was not significantly different (0.257 and 0.277, respectively). Other studies have also examined whether attitudinal or behavioral measures are better predictors of criminal and analogous acts. Tittle, Ward, and Grasmick (2003) found no significant difference using behavioral measures over cognitive measures. They concluded that both measures provided support, and behavioral measures did not explain criminality better. Only one study has found support for Gottfredson and Hirschi's (1990; Hirschi and Gottfredson 1993) prediction that behavioral measures are

superior to attitudinal. Using the Grasmick et al. scale as the cognitive measure and various risk-taking behaviors as the behavioral measure, Benda (2005) found that cognitive and behavioral measures were both significant predictors of substance use and various property and person offenses. However, behavioral measures were stronger predictors of the outcome measures than the Grasmick et al. scale.

In summary, similar to social bonding theory, self-control theory significantly explains delinquent and criminal offenses. Individuals who develop high self-control are less likely to be impulsive, insensitive, physical, risk-taking, short-sighted, and nonverbal. Different types of samples (male, female, juvenile, and adult) have been tested with similar results; therefore, the sample does not significantly influence the relationship between self-control and delinquent and criminal behavior (Pratt and Cullen, 2000). Conversely, one of the most controversial arguments is the type of technique used for measuring self-control. Hirschi and Gottfredson (1993) prefer behavioral measures, like those used by Keane et al. (1993), to measure self-control. This method, however, has tautological issues. The other technique is cognitive, or attitudinal, measures that tap into the six underlying dimensions of self-control. Pratt and Cullen's (2000) meta-analysis found that both self-control measurement techniques were suitable predictors of delinquent and criminal offenses (see also Tittle et al. 2003). While questions may still arise, self-control appears to be unidimensional. Also, empirical findings suggest that self-control is robustly related to criminal and analogous behavior regardless of how it is measured.

NEW SELF-CONTROL THEORY

Despite the success and recognition of self-control theory, it appears once again (similar to the origins of social bonding theory) that Hirschi (2004) has become discontented with the psychology of delinquency and has shifted to a new conceptualization that removes the use of personality traits in the determination of the causes of delinquency. Specifically, he identified four criticisms about the conceptualization of self-control as a personality construct and also how self-control was being measured.

1. Both suggest differences among offenders in motives for crime, contrary to explicit assumptions of the theory that offenders do not specialize and that motives are irrelevant.

2. Both contradict (Gottfredson and Hirschi's) explicit assertion that personality traits have proved to be of little value in the explanation of crime.

3. Both fail to explain – in a manner consistent with the theory – how self-control operates. Instead, both suggest that offenders act as they do because they are what they are (impulsive, hot-headed, selfish, physical risk takers), whereas nonoffenders are, well none of these.

4. As would be expected from item 3, and most telling, this exercise fails to produce a measure of self-control in which more is better than less, in which the effects of the individual traits on criminal behavior are

cumulative. Single traits predict criminal behavior as effective as does and

all-inclusive self-control scale. (Hirschi, 2004, p.542).

With these issues acknowledged, Hirschi's explanations are unclear and remain

somewhat confusing. For instance, it is uncertain why the conceptualization and

measurement is focused on motivation when elements of self-control (e.g., impulsivity

and insensitivity) are not motivating factors for delinquency. Also, Hirschi takes issue

with the Grasmick et al. (1993) scale, stating that it fails to produce a cumulative

measure; however, it is unclear why higher scores on this measure fail to capture the idea

that more self-control is better than less self-control.

In addition to these four problems, another modification Hirschi (2004) has

recommended refers to how the consequences of crime are conceptualized. Originally, he

(and Gottfredson) suggested that long-term consequences were important to consider. In

his revised perspective, however, Hirschi now considers the full range of consequences of

a particular act as the best measure of self-control (p.542-543). By recognizing this, he

returns to the assumption that self-control involves some type of cognitive evaluation of

competing interests, an idea that is central to control theories (Hirschi, 2004, p.542). With

this new, more expansive consideration of consequences, individuals are expected to go

back to the bonds found in social control theory, where the principal source of control is

an individual's concern for the opinions of others (e.g., Do I care what X thinks of me?;

Will X know what I have done?). This modification provides a more direct link between

self-control and social bonds; in fact, Hirschi (2004, p.543) states that "…social control

and self-control are the same thing."

In an effort to better capture this new conceptualization, Hirschi places an importance on inhibitors, stating that self-control is "the set of inhibitions one carries with one wherever one happens to go" (Hirschi, 2004, p. 543). Inhibitors are factors that prevent an individual from engaging in crime, and according to Hirschi (2004, p. 545), the key inhibitors are congruent with social bonds (attachment, commitment, involvement, and belief) and include concern for other's opinions such as parents, friends, teachers, and authorities of the law. In addition, he also emphasizes the number (and salience) of inhibitors, and not simply the presence of any or all inhibitors as indicative degrees of self-control. However, Hirschi never revisits the idea of salience in his own research. (This issue is further discussed below.) To accurately operationalize new self-control, Hirschi recommends using bonds as inhibitors and counting them (dichotomized and summed), which addresses the "more is better than less" criticism mentioned above. Inhibitors influence decision making, specifically, the more inhibitors an individual possesses, the more likely they will engage in a rational decision to not offend. In the following sections, the few studies that tested new self-control are discussed further in depth.

Empirical Status of New Self-Control

To examine the new conceptualization of self control, Hirschi (2004) used data from his Richmond, California Youth Project. He constructed a nine-item dichotomized inhibitor scale (bonds) based on the notion that if the number of self-reported inhibiting factors increased (i.e., self-control increases), delinquency should decrease. In addition, the nine items are reflective of the bonds related to attachment (parental and school) and

commitment (school). He suggested that the more bonded individuals are, the more inhibitions they have.

Hirschi's (2004) analysis consisted of three parts. First, the redefined self-control scale was correlated with a six-item delinquency scale. In addition to the Richmond Youth Project, Hirschi also constructed a similar scale using seven of the nine items with a high school delinquency study in Fayetteville, Arkansas. Based on his analysis, both sets of data supported his new conceptualization of self-control showing the increase of inhibitors (i.e., bonds) is negatively related to delinquency. Second, Hirschi examined how this new conceptualization is related to peer delinquency. Using the Richmond data, he found as the number of self-reported inhibiting factors increased, the number of respondents reporting that one or more of their friends have been picked up by the police decreased. Third, using the Fayetteville sample, Hirschi correlated a nine-item self-control scale, a six-item self-reported delinquency scale, and an eleven-item measure of acts analogous to crime. In this analysis, higher self-control was negatively related to analogous acts, whereas the self-reported delinquency scale was positively related to committing analogous acts. Thus, all of Hirschi's analyses showed support for his newly reconceptualized self-control theory.

In an attempt to measure new self-control, Piquero and Bouffard (2007) pieced together various components from Hirschi's (2004) conceptualization. In particular, they created a scale to examine the cognitive mechanism (cost times salience) that enters an individual's decision making process. Although Hirschi (2004) indicated that social bonds were the key inhibitors, they referred to the costs (times salience) as inhibitors, which is unclear whether that was what Hirschi was suggesting. Using a college sample,

they presented two hypothetical offending situations that included drunk-driving and sexual coercion (only men were assessed on the latter). After reading the imaginary situations, participants were asked to indicate their likelihood (from 0-100 percent) of driving home, and men were asked to note their likelihood of attempting to get a woman drunk in order to have sex with her. The average of these scenarios was used as the dependent variable. To operationalize Hirschi's newly conceptualized self-control, participants listed up to seven "bad things" that might occur if they engaged in the offending behavior from each scenario. By using this method, they were able to measure the number of consequences an individual attends to before committing an act. In order to capture the dimension of salience, participants were also asked how important (0-100 percent) each of the items were that they listed in making the decision on whether to commit the acts. To obtain relevance of the individual's answers, they multiplied the number of costs listed by the average salience across them. In addition to the redefined self-control measure, participants also completed the 24-item Grasmick et al. (1993) scale and eight-item social bonding scale that measured their level of attachment, belief in the law, and religious commitment.

Piquero and Bouffard (2007) first examined the Grasmick et al. scale with the drunk driving and sexual coercion intentions. Next, they examined their new conceptualization scale – cost times salience. Finally, they included both measures of self-control (Grasmick et al. scale and new self-control scale) and social bonds to examine their independent effects. In comparing results with the Grasmick et al (1993) scale and social bonds, Piquero and Bouffard (2007) found their depiction of Hirschi's (2004) newly conceptualized self-control was a stronger predictor of drunk driving and

sexual coercion. In addition, when including both measures of self-control (Grasmick et al. scale and new self-control scale) and social bonds, they found the effect of the attitudinal measure and social bonds were non-significant. In fact, the social bonds measure was not even significant before the cost/salience measure was included. This suggests that their depiction of Hirschi's new conceptualization that considered all costs associated with a criminal act (multiplied by the salience of these costs) provided better predictive utility than Hirschi's original conception of self-control and social bonds. However, their method of operationalizing Hirschi's new conceptualization is unclear, as a result of social bonds not having a significant effect, which are presumably the primary inhibitors according to Hirschi (2004).

Likewise, in determining which measures of self-control have an important role in understanding digital piracy, Higgins et al. (2008) utilized the Grasmick et al. (1993) scale, social bonds, and Piquero and Bouffard's (2007) self-generated responses to measure the cost and salience that purportedly captures an individual's inhibitions. Using 358 surveys collected from college students, their results varied. When all three measures were included in the model, they found that individuals with higher scores on the Grasmick scale, stronger bonds, and more inhibitions (greater cost times salience) were less likely to illegally download music. In addition, and contrary to Piquero and Bouffard's (2007) results, they found that the cost times salience variable and social bonds did not reduce the effect of the Grasmick et al. (1993) scale. When examined together, this suggests that both measures of self-control and social bonds independently and significantly influence an individual's decision on whether to perform digital piracy.

28

However, similar to Piquero and Bouffard (2007) and arguably contrary to Hirschi (2004), they did not refer to social bonds as the primary inhibitors.

In conclusion, Hirschi's (2004) conceptualization of new self-control changed the theory's foundation from measuring personality traits to measuring inhibitors that influence cognitive appraisals. That is, social bonds influence an individual's inhibitions on whether to commit criminal behavior. Although Hirschi's redefined self-control has received some modest support, there are only two studies that have examined it and additional research is warranted. In addition, there are still many questions left to be answered that involve (1) what the primary inhibitors are and (2) how inhibitors have an impact on individual's decision making.

Measurement and Conceptualization Issues

Social bonding theory and self-control theory are established frameworks; however, with the modest amount of research on Hirschi's (2004) new conceptualization of inhibitors, it is important to examine the most recent changes further. Hirschi's redefined self-control disavows measuring the theory with personality traits and suggests that social bonds serve as the primary inhibitors. The bonds, in turn, influence the decision making process of whether to engage in a criminal act. By including inhibitors, self-control now appears to place greater emphasis on decision making. With this change, self-control's new conceptualization seems to implicate that rational choice models are also necessary. According to Piquero and Bouffard, there seems to be a logical association between measuring an individual's self-control using inhibitors and rational decision-making. This is not the first time self-control has been connected with other theoretical frameworks. Recall, that Pratt and Cullen (2000) found self-control is not the

only predictor of delinquent and criminal behavior. Studies have integrated rational choice models with self-control in an effort to provide a more general model that explains offending (Nagin & Paternoster, 1993; Piquero and Tibbetts, 1996; Sellers, 1999). In addition, studies have also found that social bond variables mediate the relationship between self-control and delinquency (Wright et al. 1999; Longshore et al. 2004; Longshore et al. 2005).

With newer transformations of self-control theory, only a few studies (Piquero and Bouffard 2007; Higgins et al. 2008) have examined the cognitive mechanisms (cost times salience) and may have inaccurately conceptualized the role of bonds as being the primary inhibitors. Given these issues, it is unclear whether Hirschi's (2004) newest conceptualization has been fully tested. Additional research is needed that accurately compares Hirschi's new conceptualization with how social bonds and self-control have been traditionally conceptualized. In addition, the cognitive decision-making model proposed in Hirschi's (2004) new version of self-control appears to overlap with rational choice models, especially deterrence theory. Therefore, a more robust test is needed that includes elements of cognition to examine whether Hirschi's new conceptualization of inhibitors (bonds) and traditional self-control are mediated by deterrence/rational choice measures.

CURRENT FOCUS

Given these issues, the current study is an attempt to clarify and expand upon the scant literature on this topic. First, a more appropriate inhibitor scale is created using social bonds to accurately examine the independent effects that Hirschi's (2004) new conceptualization has with traditional social bonding and self-control scales. Second, and

unlike previous literature, this study will be the first to include and measure constructs from rational choice theory, with a focus on how (if at all) it is related to Hirschi's new conceptualization. Lastly, and also unlike previous literature, this study will utilize a delinquency scale (as opposed to hypothetical scenarios) in order to measure the impact that inhibitors have on various criminal activities.

CHAPTER 3

METHODS

SAMPLE

The current study and analyses are based on a self-report survey administered to students attending one middle school and one high school in Largo, Florida in the Fall of 1998. A questionnaire was designed that used Likert-type scales to gather an array of information from the participants. Involvement was voluntary and required passive consent from the student's parents. All types of students, including mainstream, gifted, and handicapped classes, were surveyed and allowed to participate. Before the survey was given, students were informed that their responses were confidential and anonymous.

In the high school (grades 9-12), the survey was administered to 30 randomly selected classes during the third period. This course period was selected because the majority of students were in class at this time. With the help from a member of the research team assigned to each class, students completed the questionnaires. Of the 796 eligible students in the 30 random classes, 625 surveys were useable, resulting in a response rate of 79 percent.

In the middle school sample (grades 6-8), a slightly different approach was required. With Social Studies classes required for all middle school students, the survey was administered during the 45 Social Studies classes among the three grades. Using two researchers for each class to aid the students, the procedure took three days. Of the 1,266

middle school students enrolled, 1,050 surveys were useable, producing a response rate of 83 percent.

The total sample size from both middle and high schools was 1,675 students, with 37.3 percent of the students from the high school (N = 625) and 62.7 percent from the middle school (N = 1,050). Age of the sample ranged from 11 to 19 (mean = 13.79, sd = 1.96) years old, and there were slightly more males (N = 835, 50.2%). In addition, the majority of the students were white (77.2%), followed by black (11.6%), Hispanic (4.1%), Asian (3.2%), and other (3.9%). Descriptives for the remainder of the key study variables used in the analyses can be found in Table 1. In the measures section, the variables are described further in depth.

Power Analyses

A power analysis was conducted to ensure there was sufficient power to observe real effects with the sample size (N=1675). According to Cohen (1988; 1992), at an alpha of 0.05 and using six independent variables, the necessary minimum number of participants required (for power = 0.80) to detect a small effect size is 686 (1998, p. 158, table 2). Based on these estimates, the current study has enough statistical power in order to perform the analyses discussed below.

Table 1: Descriptive Statistics of All Variables.

Variables	Mean	SD	Skew	SE (skew)	Range
Age	13.79	1.99	0.42	0.06	11-19
Sex (1=male)	0.50	0.50	-0.10	0.06	0-1
Race (1=white)	1.45	1.00	2.42	0.06	1-5
Traditional SB Scale	0.01	4.80	-0.51	0.06	-19.57-9.09
Bonds (inhibitors)	6.85	1.71	-0.94	0.06	0-9
Self-Control	0.02	6.30	-0.05	0.06	-18.87-17.58
Cognitive Scale	9.97	2.46	-1.68	0.06	4-12
Delinquency Scale	5.35	3.62	0.74	0.06	0-17

Note: Sample size (N) ranges from 1443 to 1662 due to missing data.

MEASURES

Dependent Variable

The dependent variable was a delinquency scale, which contained seventeen criminal and analogous behaviors (Cronbach's alpha = 0.85). Students were asked whether they have ever engaged in the following behaviors: (1) damaged or destroyed another's property on purpose, (2) stole an item worth 50 dollars or less (stole backpack under 50 dollars and stole other things under 50 dollars were combined) (3) lied (lied to parent, to teacher, and to get something were all combined), (4) skipped class without an excuse, (5) stayed out longer than allowed, (6) run away from home, (7) stole anything over 50 dollars, (8) used a weapon or force to get money or things, (9) hit someone to hurt them, (10) attacked someone with a weapon, (11) carried a weapon for protection, (12) burglarized (tried or gone into a house to steal something and tried or gone into a building to steal something were combined), (13) tried or stolen a car or motorcycle, (14) used tobacco products, (15) used alcohol, (16) used marijuana, and (17) used other illegal drugs. The original coding (0 = no, 1 = yes, over a year ago, and 2 = yes within the past

34

12 months) was dichotomized into 0 if the student never committed the act, and 1 if the

student did commit the act. Next, the seventeen items were added together to obtain a

delinquency scale (0 to 17). The mean number of acts committed was 5.35 with a

standard deviation of 3.62.

Independent Variables

Self-Control

Eleven items, including both attitudinal and behavioral items, comprised the low

self-control scale (Cronbach's alpha = 0.78). Eight attitudinal items similar to

components found on the Grasmick et al. (1993) scale were included: (1) take risk for fun

of it, (2) like to test self by doing something risky, (3), act on spur of the moment without

thinking, (4) do what is pleasurable now at cost, (5) I do not feel bad for others with

problem, (6) if things upset people, it is their problem, (7) I lose my temper easily, and

(8) when I am mad, people better stay away. The variables are coded on a Likert-style

response scale (1 = strongly agree, 2 = agree, 3 = disagree, 4 = strongly disagree) and

several variables were reversed-coded to ensure consistency in the direction of

measurement. In addition to the attitudinal measures, three behavioral measures were also

used: (1) more likely to confront or avoid classmate, (2) more likely to tease or be friends

with someone, and (3) more likely to hit or talk when mad. These were operationalized

differently than the attitudinal self-control measures (a six point scale; e.g., 1 = more

likely to confront, 6 = more likely to avoid). Due to the attitudinal and behavioral

measures having different metrics, the z-score for each item was computed, and these

standardized scores were summed to create the low self-control scale. The range of the

standardized scale was -18.87 to 17.58 with a mean of 0.02 (sd = 6.30); larger values indicated higher self-control.

Inhibitors (Social Bonds)

Similar to Hirschi (2004), social bonds were used in this study as a measure of inhibitors for the new conceptualization of self-control. As noted above, Hirschi operationalized new self-control by going back to the bonds, where he suggested that the more bonded an individual was the more inhibitors the individual possessed. In order to create a comparable measure, a total of nine maternal attachment and school commitment variables were used (Cronbach's alpha = 0.77). These include five maternal attachment variables: (1) able to talk to mother, (2) ask for mother's advice, (3) desire to be like their mother (these variables are coded on a six-point semantic differential scale; e.g., 1 = able to talk with mother, 6 = not able to talk with mother). Values one through three on this scale were recoded into "1" to represent an inhibitor, while values four through six were recoded into "0" to indicate not an inhibitor. In addition, the remaining maternal attachment variables included (4) mother knows whereabouts, and (5) mother knows who you are with (originally coded on a four-point Likert scale; e.g., 1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree) were also recoded. Values three and four were coded into "1" to indicate an inhibitor, and values one and two were recoded into "0" to specify not an inhibitor. In addition, the four school commitment variables include: (1) importance of getting good grades in school, (2) importance of getting respect from teachers, (3) homework is a waste of time, and (4) I try hard in school. The school commitment variables were coded on a four-point Likert-style response scale. However, they were also recoded into "0 and 1" to ensure consistency with the maternal attachment

variables. Several variables were also reversed-coded to ensure consistency in the direction measured.

Social bonds were operationalized in two different ways. First, the measures were dichotomized (0 = not an inhibitor; 1 = inhibitor) and combined together (range: 0 to 9; mean = 6.85; sd = 1.71) in order to create a social bonding (inhibitor) scale, comparable to Hirschi (2004). In this scale, higher values indicate more inhibitors. In addition to this scale, another social bonding scale (not dichotomized) was created that used the same items. That is, the same bonding items were used to create a measure of social bonding consistent with previous conceptualizations. The only difference between the new and traditional bonding scales was the manner in which the items were coded – either dichotomously (new bonding) or continuously (traditional bonding). Similar to items comprising the self-control scale, the traditional scale used z-scores due to the measures having different metrics. The range of the standardized scale was -19.57 to 9.09 with a mean of 0.01 (sd = 4.80); higher values indicate stronger bonds.

Costs (Cognitive Scale)

As noted above, Hirschi (2004) proposed a cognitive decision-making model that overlaps with rational choice models, like deterrence theory. In order to fully illustrate Hirschi's redefined concept of self-control, rational choice measures are used to capture the calculation of costs. Four variables, which assessed both costs and salience, measured how big of a problem it would be for the respondent if caught committing specific acts. The following acts were included: (1) skipping school (2) stealing, (3) hitting someone, and (4) using marijuana. These variables were coded the following: 0 = no problem at all, 1 = small problem, 2 = medium problem, and 3 = big problem. They were combined into

a scale (range = 0 to 12; mean = 9.97, sd = 2.46), in which higher values indicated a bigger problem if caught carrying out these acts. In addition, the Cronbach's alpha indicates adequate levels of internal consistency (0.76).

Control Variables

The major control measures for this study are gender, race, and age. Specifically, gender is a dichotomous variable and is coded 0 = female and 1 = male. Race was dichotomized for the purposes of this study and is coded 0 = white and 1 = non-white.

RESEARCH QUESTIONS/HYPOTHESES

Based on an extensive review of the literature and theories (earlier control theories, social bonding, self-control, and new self-control), the following research questions and hypotheses highlight the major areas of examination.

Research question 1: Is Hirschi's (2004) new conceptualization of self-control (dichotomized bonds) related to delinquency?

Research question 2: Does the original conceptualization of self-control (personality and behavioral) demonstrate a unique effect on delinquency above and beyond the new conceptualization?

Research question 3: Is there evidence that either the new conceptualization or traditional conceptualization of self-control operates through the cognitive scale (rational calculation of costs)?

Research question 4: Is this new conceptualization (dichotomized) substantively different from the traditional way we have conceptualized bonds?

Hypothesis 1:   Based on Hirschi (2004), it is expected that the new

conceptualization (dichotomized bonds) will be significantly

related to the delinquency scale.

Hypothesis 2:   Based on Higgins et al. (2008), it is predicted that the traditional

conceptualization of self-control will demonstrate a unique effect

on delinquency, net of the new conceptualization of bonds.

However, based on previous literature (Piquero and Bouffard,

2007; Higgins et al. 2008), the traditional conceptualization of self-

control is not expected to have stronger effects than the new

conceptualization.

Hypothesis 3:   Based on Hirschi (2004), it is noted that control theories involve an

element of cognitive evaluation. Therefore, it is expected that both

the new (dichotomized bonds) and traditional conceptualization of

self-control will be mediated by the cognitive scale (rational

calculation of costs) and reduce the effect of the independent

variables (bonds and self-control) to non-significance.

Hypothesis 4:   Although there exists no empirical data on this issue yet, the new

conceptualization will not be substantively different from a

traditional social bonding scale due to the similarities and

replication of measures found in both scales.

ANALYTIC PLAN

In the analytic process, three types of analyses were performed. First, descriptive statistics of the independent, dependent, and control variables were computed. Percentages were presented for dichotomized variables, and means and standard deviations were used for ordinal and interval variables. Next, bivariate correlations were performed to examine how age and the theoretical measures (self-control, inhibitors traditional bonds, and costs) were related to the delinquency scale. Lastly, a series of ordinary least squares (OLS) regression models were constructed to test the effects of the key study variables on the delinquency scale while controlling for age, race, and sex. In order to successfully examine the research questions, the key study variables were added and removed (in steps) to test their unique, independent effects. In order to ensure that all assumptions of linear regression were met, key model assumptions were checked. Small issues of heteroskedasticity and normality of residuals were detected, but these do not appear to be a problem given that the sample size is 1675 students (McClendon, 2002). In addition, variation inflation factors (VIF's) were examined to ensure collinearity was not an issue with the variables. There were no issues of multicollinearity with the independent variables in the mediation model. However, multicollinearity between the traditional social bond scale and new social bond scale (inhibitors) was present. This was expected due to the similarities of items used in both scales. As a result, no regression analysis included both traditional bonds and inhibitors in the same model. After examining all key assumptions, OLS regression seems appropriate for the analysis. Thus, there were a total of ten models.

In order to test for mediation, Baron and Kenny (1986) suggest estimating four regression equations: first, a relationship between the exogenous (predictor) variables and endogenous (mediator) variables; second, a relationship between the exogenous and dependent variable; third, a relationship between the endogenous variables and dependent variable; and fourth, the significant relationship between the exogenous and dependent variables is rendered non-significant after the inclusion of the endogenous (mediator) variables (see Figure 1). To assess these relationships, a series of models were constructed. In the first set of models, the endogenous variables were regressed on the exogenous variable. That is, the costs were independently regressed onto self-control and inhibitors (bonds). Next, the second set of models explored the exogenous and dependent variables. This included measuring the relationship between the inhibitors and delinquency, and also between self-control and delinquency. In the third set of models, the endogenous and dependent variables were examined. This consisted of measuring the relationship between the costs and the delinquency scale. Next, the fourth set of models included both the exogenous variables and endogenous variables with the delinquency scale. This consisted of measuring the inhibitors, costs, and delinquency scale together, and also the self-control scale, costs, and delinquency scale together. Last, delinquency was regressed onto each of the exogenous variables, along with the endogenous variable, to examine the relationship when all the measures were included into one model. In addition to testing for mediation, additional models were also used to test the independent effects between the new conceptualization of bonds and a traditional bonding scale, and also between the new conceptualization and self-control. By following this analytic process, results were recorded for all the research questions.

41

Figure 1: Mediation Model of Key Study Variables.
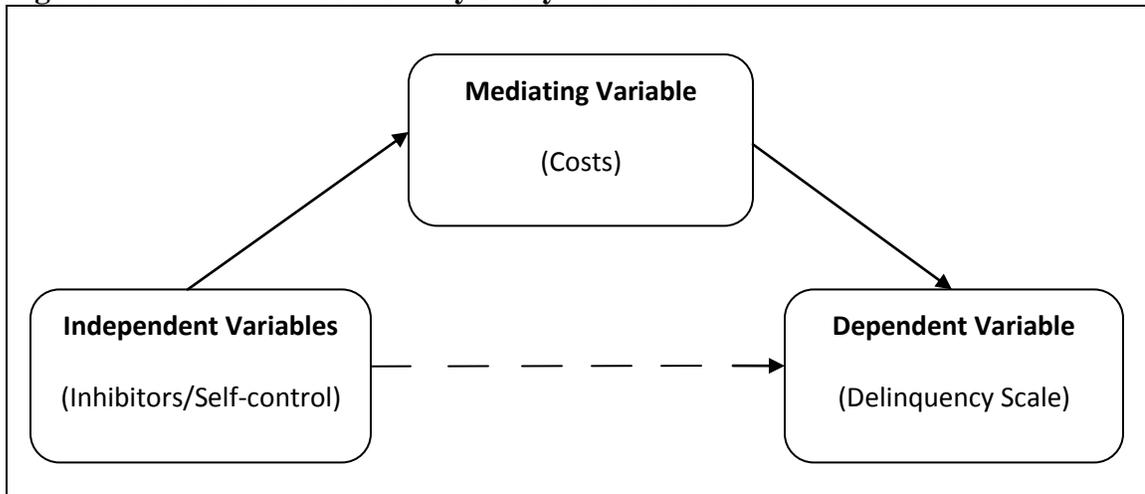
Note. A dashed line represents a possible insignificant relationship if the mediator works.
Note: Sample size (N) ranges from 1443 to 1662 due to missing data.

CHAPTER 4

RESULTS

BIVARIATE FINDINGS

Independent sample t-tests were performed in order to examine the relationship between the nominal level variables of sex, race, and the delinquency scale (not shown in tabular form). Males commit more delinquent acts than females on average (t-value = 6.34, mean = 5.78 and 4.94 respectively at $p < 0.001$). Additionally, results from the independent t-tests showed no significant relationship between race and the number of delinquent acts committed.

Table 2 illustrates the bivariate relationships among the key theoretical variables and delinquency. All of the correlations were significantly related to delinquency in the expected directions (the full correlation matrix is located in Appendix A). Age has a moderate and positive relationship with the delinquency scale ($r = 0.25$, $p < 0.01$). This suggests that as an individual's age increases, the number of delinquent acts committed also increases. The traditional social bonding scale ($r = -0.51$), inhibitors ($r = -0.49$), self-control ($r = -0.59$), and costs ($r = -0.53$) were all strongly and negatively related with delinquency at $p < 0.01$. Therefore, individuals who have weak bonds, fewer inhibitors, lower levels of self-control, and who perceived lower costs were significantly more likely to commit delinquent acts.

Table 2: Bivariate Correlations (Pearson's r) with Key Study Variables.

Variables	Delinquency
Age	0.25*
Traditional SB Scale	-0.51*
Inhibitors (Bonds)	-0.49*
Self-Control	-0.59*
Costs	-0.53*

$* p < 0.01.$

Note: Sample size (N) ranges from 1443 to 1662 due to missing data.

MULTIVARIATE FINDINGS

The results from the ordinary least squares (OLS) regression analyses are presented in Tables 3 through 5. Overall, all the models were statistically significant ($p < 0.001$), which suggests that one or more of the covariates included in the model has a significant relationship with delinquency.

In models 1 and 2 (Table 3), the first step of mediation was tested by examining the effects of bonds (inhibitors) and self-control on the costs (used as a dependent variable). Model 1 and model 2 indicate that both inhibitors (bonds) and self-control had a positive significant relationship with the perceived costs at $p < 0.001$. This indicates individuals with more inhibitors and higher levels of self-control were more likely to perceive greater costs of engaging in delinquency ($b = 0.49$ and 0.16, respectively). In addition, the standardized coefficients suggests that the association between the inhibitors and self-control with the costs were moderately strong in magnitude ($\beta = 0.35$ and 0.42, respectively).

Table 3: Regression Models of Key Independent Variables with Costs.

Variables	Model 1			Model 2		
	b	SE	β	b	SE	β
Age	-0.13**	0.03	-0.11	-0.16**	0.03	-0.13
Sex	-0.72**	0.12	-0.15	-0.46**	0.12	-0.09
Race	-0.05	0.06	-0.02	-0.04	0.06	-0.02
Inhibitors (Bonds)	0.49**	0.04	0.35			
Self-Control				0.16**	0.01	0.42
Adj. R²		0.18**			0.22**	

**p < 0.001
Note: Sample size (N) ranges from 1443 to 1662 due to missing data.

In the second step of mediation, according to Baron and Kenny (1986), there needs to be a relationship between the key independent variables and the dependent variable. In models 1 and 2 (Table 4), both the inhibitors and self-control had a negative significant relationship with the delinquency scale ($p < 0.001$). This illustrates that individuals with fewer bonds and lower self-control were more susceptible to delinquency. Further, the standardized coefficients imply that the relationships between these independent variables and delinquency were strong (inhibitors, $\beta = -0.47$; self-control, -0.58). Also, model 1 (Table 4) supports the first hypothesis that Hirschi's new conceptualization (inhibitors) is significantly related to delinquency.

Next, the independent variables were removed and costs were included to examine the third step of mediation (not shown in tabular form). The mediator (costs) was negatively and significantly related to the delinquency scale, indicating that individuals who perceived fewer costs were more delinquent ($b = -0.75$, se $= 0.03$, $p < 0.001$). In addition, the standardized coefficient suggest that the relationship between costs and delinquency was strong ($\beta = -0.51$).

In model 3 (Table 4), the mediator was removed and both the inhibitors and self-control were added to examine whether the original conceptualization of self-control demonstrated a unique effect on delinquency above and beyond the new conceptualization (inhibitors). Similar to models 1 and 2 (in Table 4), both the inhibitors and self-control were negatively and significantly related to delinquency (b = -0.56 and -0.26, respectively, at $p < 0.001$). In addition, when both inhibitors and self-control were included in the same model, their effect sizes were reduced (43 and 21 percent, respectively). This indicates that inhibitors and self-control are related to each other, and have some shared variance. Also, the standardized coefficients illustrates that self-control had a stronger effect than the inhibitors on delinquency (β = -0.46 and -0.27, respectively). Similar to previous literature (Higgins et al. 2008) and consistent with the second hypothesis, the old and new conceptualization did demonstrate unique effects with delinquency. In addition, but contrary to the second hypothesis, the original conceptualization of self-control had stronger effects than the new conceptualization of inhibitors when examining them together in the same model.

Table 4: OLS Regression Models with Key Study Variables.

Variables	Model 1			Model 2			Model 3		
	b	SE	β	b	SE	β	b	SE	β
Age	0.30**	0.04	0.17	0.38**	0.04	0.21	0.31**	0.04	0.17
Sex	0.47*	0.17	0.07	-0.18	0.15	-0.03	-0.10	0.15	-0.02
Race	0.07	0.09	0.02	0.04	0.08	0.01	0.04	0.08	0.01
Inhibitors (Bonds)	-0.97**	0.05	-0.47				-0.56**	0.05	-0.27
Self-Control				-0.33**	0.01	-0.58	-0.26**	0.01	-0.46
Costs									
Adj. R²		0.28**			0.39**			0.44**	

*p < 0.05. **p < 0.001.
Note: Sample size (N) ranges from 1443 to 1662 due to missing data.

In models 1 through 3 (Table 5), the effects of including the mediator were examined. According to Baron and Kenny (1986), the relationship between the independent variables and dependent variable should become non-significant after the inclusion of the mediator if mediation is occurring. First (models 1 and 2; Table 5), the independent variables were examined individually with the mediator. In model 1 (Table 5), both the inhibitors and costs remained negatively and significantly related to delinquency (b = -0.70 and -0.59, respectively, at p < 0.001). However, the effect size of the inhibitors was reduced 30 percent, from strong (β -0.47, model 1, Table 4) to moderate (β -0.33, model 1, Table 5). This suggests partial mediation occurred through the perceived costs. Similar results were also found when examining self-control and the mediator in model 2 (Table 5). Both self-control and costs remained negatively and significantly related to delinquency (b = -0.25 and -0.50, respectively, at p < 0.001). However, the effect size of self-control became weaker (β = -0.58, model 2, Table 4; β = -0.45, model 2, Table 5), dropping a moderate 22 percent. This also suggests that the effect of self-control on delinquency is partially mediated through the perceived costs. Although mediation is present in these models, it is also important to examine the independent variables simultaneously with the mediator. This will more accurately characterize the relationships and demonstrate the impact of the mediator when all key variables are examined in the same model.

Next, in model 3 (Table 5), both the inhibitors and self-control were included in the same model and examined simultaneously with the mediator. Similar to results found in models 1 and 2 (Table 5), inhibitors, self-control, and costs remained negatively and significantly related to delinquency (b = -0.43, -0.21, and -0.43, respectively, at p <

0.001). The standardized coefficients suggest that both the inhibitors and self-control had moderate effects on delinquency after the inclusion of the mediator ($\beta = -0.21$ and -0.38, respectively). Conversely, similar to model 3 (Table 4), the effect sizes for inhibitors and self-control had a moderate reduction (22 and 17 percent, respectively) after the inclusion of the mediator. Although this suggests that inhibitors and self-control are slightly mediated by the costs, the reduced effect size in inhibitors was also influenced by the inclusion of self-control (model 3, Table 4). Contrary to the third hypothesis, neither the inhibitors nor self-control were fully mediated by the costs, suggesting that control theories (as operationalized here) do not exert their influence entirely through an element of cognitive evaluation as Hirschi (2004) stated.

Table 5: OLS Regression Models Examining the Effects of Mediation.

Variables	Model 1			Model 2			Model 3		
	b	SE	β	b	SE	β	b	SE	β
Age	0.23**	0.04	0.13	0.30**	0.04	0.16	0.26**	0.04	0.14
Sex	0.03	0.15	0.01	-0.43*	0.14	-0.06	-0.34*	0.14	-0.05
Race	0.04	0.08	0.01	0.03	0.07	0.01	0.02	0.07	0.01
Inhibitors (Bonds)	-0.70**	0.05	-0.33				-0.43**	0.05	-0.21
Self-Control				-0.25**	0.01	-0.45	-0.21**	0.01	-0.38
Costs	-0.59**	0.04	-0.39	-0.50**	0.03	-0.33	-0.43**	0.03	-0.28
Adj. R²		0.40**			0.48**			0.50**	

*p < 0.05. **p < 0.001.
Note: Sample size (N) ranges from 1443 to 1662 due to missing data.

Lastly, OLS regression models (not shown in table) were used to examine whether Hirschi's (2004) new conceptualization of bonds (inhibitors) is substantively different from a traditional bonding scale. As noted earlier, there was a problem with multicollinearity between the traditional bonding scale and inhibitor bonding scale (VIFs = 4.89 and 4.33, respectively). As such, both measures could not be simultaneously examined within one model. Therefore, each conceptualization was assessed

independently, and their effect sizes were compared. In their respective models, both the

traditional bonding scale and inhibitor scale were negatively and significantly related

with the delinquency scale (b = -0.39 and -0.97, respectively) at $p < 0.001$. In addition,

the standardized coefficients illustrate that the traditional bonds had slightly stronger

effects on delinquency than the new conceptualized bonds (β = -0.52 and -0.47,

respectively). Although quite similar, the traditional bonding scale may have proved to be

somewhat stronger because there was more variation in this measure compared to the

inhibitor scale (which was based on dichotomous items). However, the difference in

effect size is modest, supporting the last hypothesis that these scales are not substantively

different.

CHAPTER 5

DISCUSSION AND CONCLUSIONS

The purpose of this study was to accurately recreate Hirschi's new self-control scale using inhibitors (bonds), and expand upon the modest amount of previous literature (Piquero and Bouffard, 2007; Higgins et al. 2008) on this subject. This was done to examine whether Hirschi's (2004) new conceptualization of inhibitors was independent from self-control and also whether there was a substantial difference between the new conceptualization of inhibitors and traditional measures of bonds. In addition, Hirschi (2004) stated that control theories require an element of cognitive evaluation; therefore, this study also examined whether elements of cognition, in the form of perceived costs, mediated the effects of both the new conceptualization of inhibitors and self-control. Specifically, four hypotheses were examined (see pp. 38-39). To examine this new conceptualization, data from a survey of 1675 middle school and high school students were used. Based on the findings, some components of Hirschi's (2004) new conceptualization were supported, while others were not.

First, the results indicated that the new conceptualization of inhibitors (dichotomized bonds) was positively and significantly related to delinquency in the predicted direction, consistent with the first hypothesis. This result was expected due to the support found in Hirschi (2004), in which he used both parental attachment and school commitment bonds. In addition, this result was consistent with previous literature that has examined the relationship between attachment and commitment with various

50

delinquent and analogous behaviors (Conger, 1976; Junger-Tas, 1992; Durkin et al., 1999; Durkin et al., 2007; Krohn et al., 1983).

Next, the results supported the second hypothesis on whether Hirschi's (2004) new conceptualization of inhibitors had an independent effect, net of self-control. However, when both variables were included in the same model, their effect sizes were reduced. The effect of self-control was reduced by 21 percent, while the effect of inhibitors was reduced by 43 percent. This suggests that both inhibitors and self-control have shared variance, even though they had independent effects. Similar to previous literature, this finding is consistent in that social bonds and self-control account for unique variance in delinquent outcomes (Wright et al. 1999; Longshore et al. 2004). In addition, but contrary to the second hypothesis and previous literature (Piquero and Bouffard, 2007; Higgins et al. 2008), self-control had stronger effects on delinquency than the new conceptualization of bonds. However, this study conceptualized inhibitors differently than those studies. Whereas this study used bonds to replicate Hirschi's (2004) new construct (which he labeled as inhibitors), other studies operationalized inhibitors as the perceived costs (multiplied by their salience). It is unclear why these previous studies operationalized inhibitors differently, although it does appear that their conceptualizations depart from Hirschi's (2004) ideas. However, those other studies did include a measure of social bonds (although not labeled as inhibitors), and in both occurrences the authors found bonds exerted weaker effects than personality-based measures of self-control. In that regard, the current findings are in accord with their efforts.

Contrary to the third hypothesis, both inhibitors and self-control were not fully mediated by the rational costs that an individual perceives to be associated with delinquency. In addition, and also in contrast to Hirschi (2004), this suggests that control theories do not require an element of cognitive evaluation. This result is consistent with previous literature, which examined the perception of rational costs associated with crime, and found it to be irrelevant in regard to an individual's level of self-control or bonds (Tittle and Botchkovar, 2005; Wright et al. 2004). It should be noted, however, that costs may only contribute partially to the explanation. Rewards may also play a role. However, control theories assume motivation is constant; therefore, any mediating effect of rewards may be incompatible with the underlying assumptions that are held by control theories. In addition, the relatively weak mediation observed in the present study may be attributable to the fact that the scale consisted of only four items. Hirschi (2004) emphasized the significance of the full range of costs, and the current measure may have not tapped into this completely. Perhaps, a scale that captures a fuller range of costs an individual might perceive before committing a delinquent act would more fully mediate the influences of inhibitors and self-control on delinquency.

The last hypothesis was supported, which examined whether the new conceptualization of inhibitors (bonds) was substantively different from a traditional bonding scale. Although traditional bonds were somewhat stronger, the differences in the effect sizes were quite modest. Perhaps the slightly stronger effect found in the traditional bonds was due to this scale having more variation in the measures than the new conceptualization of inhibitors (bonds), which was based on dichotomous items. Perhaps if this study utilized only the extreme values when dichotomizing the inhibitors, a more

pronounced difference between this new conceptualization and the traditional

conceptualization of bonds may have been captured. However, this was not employed in

the current analysis because it would have reduced both the sample size and power. In

addition, the problem of multicollinearity between the traditional bonds and inhibitors

(dichotomized bonds) suggests that these two scales are essentially the same. The new

conceptualization of inhibitors (bonds) works well in explaining delinquency; however, it

is neither better nor different from the way bonds have been conceptualized for decades.

Although Hirschi (2004) suggests this new conceptualization is something substantively

different from social bonding theory (Hirschi, 1969), the current results suggest

otherwise. Also, if this new conceptualization is to play any meaningful role in future

research, it is important for Hirschi to better explain why operationalizing bonds

dichotomously enhances the theoretical construct.

Overall, the results indicated that Hirschi's new conceptualization of inhibitors is

related to delinquency. However, there is no support that dichotomizing bonds is unique

and/or a better measure than self-control and a traditional bonding scale. In addition, the

results also suggest that both inhibitors and self-control are modestly mediated by a

cognitive process, indicating their effects do not operate primarily through rational

decision-making. As such, it remains unclear whether the new conceptualization

contributes substantially to control theories.

Despite the interesting and informative findings generated from the current

investigation, this study is not without limitations. First, not all variables from each

theoretical construct were fully measured in this study. The Grasmick et al. (1993) scale

was not used in its entirety. Of the 24 items found in the Grasmick et al. scale, only eight

measures were utilized. In addition, each element of the social bond was not assessed. In his reanalysis, Hirschi (2004) focused on attachment (to parents) and commitment (to school). Because the goal of the present study was to replicate his scale accurately, only these elements of the social bond were examined.

Finally, there are issues with the generalizability of the results. The sample used in the analyses represents only middle school and high school students from specific schools in Largo, Florida. Consequently, there is no guarantee that the results observed in this study would also be found in other studies. In addition, when using a convenience sample, representativeness is compromised. Therefore, a nationally representative sample would be more appropriate. Lastly, when working with cross-sectional data, causality cannot be determined. As such, the current findings should be interpreted with a degree of caution.

The present study has implications for future research. If replicating this study, it is important to capture all dimensions of each theoretical construct in their entirety. This includes using all 24 items from the Grasmick et al. (1993) scale. Also, future research should consider the inclusion of all the elements of the social bond to create the inhibitor scale. In addition, future research may also want to use different types of samples. Previous studies (Piquero and Bouffard, 2007; Higgins et al. 2008) used college samples and found them to be acceptable when measuring Hirschi's (2004) new conceptualization. Further, it is also recommended to use a sample that represents an entire population. By doing this, both issues of generalizability and having a biased sample can be avoided. Lastly, there needs to be more exploration between the relationship of perceived costs in an individual and both inhibitors and self-control. By

tapping into and creating a fuller range of costs, both inhibitors and self-control might be more fully mediated through the costs, supporting Hirschi (2004).

Despite the limitations, this study has provided mixed evidence for Hirschi's (2004) new conceptualization of inhibitors (bonds). Empirically, the results suggest that inhibitors (bonds) are related to delinquency, which offers support for Hirschi's (2004) general transformation of the theory. However, some hypotheses were not supported, contradicting notions of Hirschi's new conceptualization. Perhaps addressing these issues and directions for future research will help provide more support for Hirschi (2004), and possibly suggest that his new conceptualization makes a substantial contribution to control theories.

REFERENCES

Akers, R. L. (1991). *Criminology Theories: Introduction and Evaluation.* 2nd ed. Los Angeles: Roxbury.

Akers, R. L. and LaGreca, A. J. (1991). Alcohol Use Among the Elderly: Social Learning, Community Context, and Life Events, p. 242-262. In David J. Pittman and Helene Raskin White, *Society, Culture, and Drinking Patterns Re-Examined.* New Brunswick, NJ: Rutgers Center of Alcohol Studies.

Akers, R.L. and Sellers, C.S. (2004). *Criminological Theories: Introduction, Evaluation, And Application*, 4th ed. Los Angeles; Roxbury.

Agnew, R. (1991). The Interactive Effect of Peer Variables on Delinquency. *Criminology,* 29; 47-72.

Agnew, R. (1993). Why do they do it? An Examination of the Intervening Mechanisms between Social Control Variables and Delinquency. *Journal of Research in Crime and Delinquency,* 30; 245-266.

Baier, Colin., and Wright, Bradley, R.E. (2001). If You Love Me, Keep My Commandments,': A Meta-Analysis of the Effect of Religion on Crime. *Journal of Research in Crime and Delinquency,* 38; 3-21.

Baron, R.M., and Kenny, D.A. (1986). The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations. *Journal of Personality and Social Psychology*, 51 (6); 1173-1182.

Benda, B. B. (2005). The Robustness of Self-Control Theory and Delinquency. *Journal of Research in Crime and Delinquency,* 28, 126-156.

Cochran, J. K., Wood, P. B., Sellers, C. S., Wilkerson,W., and Chamlin, M.B. (1998). Academic dishonesty and low self-control: An empirical test of a general theory of crime. *Deviant Behavior,* 19, 227-255.

Cohen, J. (1992). A Power Primer. *Psychology Bulletin*, 112 (1); 155-159.

Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences*. San Diego, CA: Academic Press.

Cohn, E.G., Farrington, D.P., and Wright R. (1998). *Evaluating Criminology and Criminal Justice.* Westport, CT: Greenwood Press.

Cohn, E.G., and Farrington, D.P. (1999). Changes in the Most-Cited Scholars in Twenty Criminology and Criminal Justice Journals between 1990 and 1995. *Journal of Criminal Justice*, 27; 345-359.

Conger, Rand. (1976). Social Control and Social Learning Models of Delinquency: A Synthesis. *Criminology,* 14; 17-40.

Cullen, F. T., Wright, J. P., & Blevins, K. R. (2006). *Taking Stock: The Status of Criminological Theory*. New Brunswick, NJ: Transaction Publishers.

De Li, S. (2004). The Impact of Self-Control and Social Bonds on Juvenile Delinquency In a National Sample of Midadolescents. *Deviant Behavior,* 25; 351-373.

Durkin, K. F., Wolfe, S. E., & Clark, G. (1999). Social Bond Theory and Binge Drinking Among College Students: A Multivariate Analysis. *College Student Journal,* 33(3); 450-462.

Durkin, K. F., Wolfe, S. E., & May, R. W. (2007). Social Bond Theory and Drunk

Driving in a Sample of College Students. *College Student Journal,* 41(3); 734-744.

Gibson, C., Schreck, C. J., & Miller, J. M. (2004). Binge Drinking and Negative Alcohol Related Behaviors: A Test of Self-Control Theory. *Journal of Criminal Justice*, d 32, 411-420.

Gottfredson, M. R., and Hirschi, T. (1990). *A General Theory of Crime*. Stanford, CA: Stanford University Press.

Grasmick, H. G., Tittle, C. R., Bursik Jr., R. J., and Arneklev, B. J. (1993).Testing the Core Empirical Implications of Gottfredson and Hirschi's General Theory of Crime. *Journal of Research in Crime and Delinquency,* 30 (1), 5-29.

Higgins, G. E. (2004). Can Low Self-Control Help With the Understanding of the Software Policy Problem? *Deviant Behavior*, 26, 1-24.

Higgins, G. E., Wolfe, S. E., & Marcum, C.D. (2008). Digital Piracy: An Examination of Three Measurements of Self-Control. *Deviant Behavior*, 29, 440-460.

Hirschi, T., and Gottfredson, M. R. (1993). Commentary: Testing the General Theory of Crime. *Journal of Research in Crime and Delinquency*, 30 (1), 47-54.

Hirschi, T., and Gottfredson, M.R. (2003) Punishment of children from the perspective of control theory. In Chester L. Britt & Michael R. Gottfredson (Eds.), *Control Theories of Crime and Delinquency* (pp. 151-160). New Brunswick, NJ: Transaction Publishers.

Hirschi, T. (1969). *Causes of Delinquency*. University of California Press, Berkeley, CA.

Hirschi, T. (2004). Self-Control and Crime. In R.F. Baumeister & K. D. Vohs (Eds.), *Handbook of Self-Regulation: Research, Theory, and Application.* New York:

Guilford Press.

Hoffman, J. P., & Xu, J. (2002). School Activities, Community Service, and Delinquency. *Crime & Delinquency,* 48(4); 568-591.

Jenkins, P. (1997). School Delinquency and the School Social Bond. *Journal of Research in Crime & Delinquency*, 34; 337-367.

Jensen, Gary F., and Brownfield, David. (1983). Parents and Drugs. *Criminology,* 21; 543-554.

Jones, S. and Quisenberry, N. (2004). The General Theory of Crime: How General Is It? *Deviant Behavior*, 25, 401-426.

Junger-Tas, Josine. (1992). An Empirical Test of Social Control Theory. *Journal of Quantitative Criminology,* 8; 9-28.

Keane, C., Maxim, P. S., Teevan, J. L. (1993). Drinking and Driving, Self-Control and Gender: Testing a General Theory of Crime. *Journal of Research in Crime and Delinquency,* 30, 30-46.

Krohn, M. D., Massey, J. L. (1980). Social Control and Delinquent Behavior: An Examination of the Elements of the Social Bond. *The Sociological Quarterly,* 21; 529-543.

Krohn, M. D., Massey, J. L., Skinner, W. F., & Laurer, R. M. (1983). Social Bonding Theory and Adolescent Cigarette Smoking: A Longitudinal Analysis. *Journal of Health and Social Behavior,* 24(4); 337-349.

LaGrange, T.C. and Silverman, R. A. (1999). Low Self-Control and Opportunity: Testing the General Theory of Crime as an Explanation for Gender Differences in Delinquency. *Criminology,* 37 (1), 41-72.

Langton, L., Piquero, N. L., & Hollinger, R. C. (2006). An Empirical Test of the

    Relationship   between Employee Theft and Low Self-Control. *Deviant Behavior*,

    27(5), 537-565.

Longshore, D., Chang, E., Hsieh, S., & Messina, N. (2004). Self-Control and Social

    Bonds: A Combined Control Perspective on Deviance. *Crime & Delinquency*,

    50(4); 542-564.

Longshore, D., Chang, E., & Messina, N. (2005). Self-Control and Social Bonds: A

    Combined Control Perspective on Juvenile Offending. *Journal of Quantitative*

    Criminology. 21(4), 419-437.

Love, S. R. (2006). Illicit Sexual Behavior: A Test of Self-Control Theory. *Deviant*

    Behavior, 27, 505-536.

Marcos, Anastasios C., Bahr, Stephen J., and Johnson, Richard E. (1986). Test of a

    Bonding/ Association Theory of Adolescent Drug Use. *Social Forces,* 65; 135-

    161.

Massey, James., and Krohn, Marvin D. (1986). A Longitudinal Examination of an I

    Integrated Social Process Model of Deviant Behavior. *Social Forces,* 63; 106-

    134.

Matsueda, R. L., and Anderson, K. (1998). The Dynamics of Delinquent Peers and

    Delinquent Behavior. *Criminology,* 36 (2); 269-308.

Matza, D. (1964). *Delinquency and Drift*. New York: Wiley.

McClendon, M.J. (2002). *Multiple Regression and Casual Analysis.* Long Grove, IL:

    Waveland Press.

McNeal Jr., R. B. (1995). Extracurricular Activities and High School Dropouts. *Sociology of Education,* 68(1); 62-80.

Nagin, D.S., & Paternoster, R. (1993). Enduring Individual Differences and Rational Choice Theories of Crime. *Law & Society Review,* 27, (3), 467-496.

Nye, F. Ivan. (1958). Family Relationships and Delinquent Behavior. New York: Wiley. Paternoster, R. & Brame, R. (1998). The Structural Similarity of Processes Generating Criminal and Analogous Behaviors. *Criminology*, 36 (3), 633-670.

Piquero, A.R., & Bouffard, J.A. (2007). Something Old, Something New: A Preliminary Investigation of Hirschi's Redefined Self-Control. *Justice Quarterly,* 24 (1), 1-27.

Piquero, A. R., MacIntosh, R., & Hickman, M. (2000). Does Self-Control Affect Survey Response? Applying Exploratory, Confirmatory, and Item Response Theory Analysis to Grasmick et al.'s Self-Control Scale. *Criminology*, 38 (3), 897-930.

Piquero, A.R., & Tibbetts, S. (1996). Specifying the Direct and Indirect Effects of Low Self- Control and Situational Factors in Offenders' Decision Making: Toward a More Complex Model of Rational Offending. *Justice Quarterly,* 13 (8), 481-510.

Pratt, T. C., & Cullen, F. T. (2000). The Empirical Status of Gottfredson and Hirschi's General Theory of Crime: A Meta-Analysis. *Criminology*, 38 (3), 931-964.

Reckless, Walter. (1961). A New Theory of Delinquency and Crime. *Federal Probation*, 25; 42-46.

Reckless, Walter. (1967). The Crime Problem. New York: Appleton Century Crofts.

Reckless, Walter., Dinitz, Simon., and Kay, Barbara. (1957). The Self Component in Potential Delinquency and Potential Nondelinquency. *American Sociological Review*, 25; 566-570.

Reckless, Walter., Dinitz, Simon., and Murray, Ellen. (1956). Self Concept as an

   Insulator Against Delinquency. *American Sociological Review,* 21; 744-756.

Reiss, Albert J. (1951). Delinquency as the Failure of Personal and Social Controls.

   American Sociological Review, 16; 196-207.

Sampson, R., and Laub, J. (1993). *Crime in the Making*. Cambridge, MA: Harvard

   University Press.

Sellers, C.S. (1999). Self-Control and Intimate Violence: An Examination of the Scope

   And Specification of the General Theory of Crime. *Criminology*, 37(2); 375-404.

Smith, T. R. (2004). Low Self-Control, Staged Opportunity, and Subsequent Fraudulent

   Behavior. *Criminal Justice and Behavior*, 31(5), 542-563.

Sykes, G., and Matza, D. (1957). Techniques of Neutralization: A Theory of

   Delinquency. *American Journal of Sociology*, 22, 664-670.

Tittle, C.R. (1991). A General Theory of Crime: A Book Review. *American Journal of*

   Sociology, 96; 1609-1611.

Tittle, C.R., and Botchkovar, E.V. (2005). Self-Control, Criminal Motivation and

   Deterrence: An Investigation Using Russian Respondents. *Criminology*, 43 (2),

   307-351.

Tittle, C. R., Ward, D. A., and Grasmick, H. G. (2003). Gender, Age, and

   Crime/Deviance: A Challenge to Self-Control Theory. *Journal of Research in*

   Crime and Delinquency, 40 (4), 426-453.

Vold, G., Bernard, T., and Snipes, J. (2002). *Theoretical Criminology*, 5th ed. Oxford:

   Oxford University Press.

Wong, S. (2005). The Effects of Adolescent Activities on Delinquency: A Differential

Involvement Approach. *Journal of Youth and Adolescence,* 34 (4), 321-333.

Wright, B. R. E., Caspi, A., Moffitt, T. E., and Paternoster, R. (2004). Does the Perceived

Risk of Punishment Deter Criminally Prone Individuals? Rational Choice, Self-

Control, and Crime. *Journal of Research in Crime and Delinquency*, 41 (2), 180-

212.

Wright, B. R. E., Caspi, A., Moffitt, T. E., and Silva, P. A. (1999). Low Self-Control,

Social Bonds, and Crime: Social Causation, Social Selection, or Both?

Criminology, 37 (3), 479-514.

Wright, R. A. (2000). Recent Changes in the Most-Cited Scholars in Criminology: A

Comparison of Textbooks and Journals. *Journal of Criminal Justice,* 28, 117-128.

APPENDICES

APPENDIX A: CORRELATION MATRIX OF ALL KEY VARIABLES

Table 6: Correlation Matrix of All Key Variables.

Variables	Age	Race	Sex	Costs	Self-Control	Inhibitors	Traditional Bonds
Age							
Race	-0.04						
Sex	0.04	-0.02					
Costs	-0.16**	-0.00	-0.20**				
Self-Control	-0.06*	-0.01	-0.24**	0.45**			
Inhibitors	-0.16**	-0.01	-0.14**	-0.39**	0.45**		
Traditional Bonds	-0.20**	0.01	-0.16**	0.45**	0.51**	0.87**	
Delinquency	-0.25**	0.00	0.12**	-0.53**	-0.59**	-0.49**	-0.55**

*p < 0.05. **p < 0.01.
Note: Sample size (N) ranges from 1416 to 1662 due to missing data.