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Parents and Peers as Restrictors of Opportunities: A Test of the General Theory of Crime

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Table of Contents

Abstract

According to the General Theory of Crime, lower self-control individuals with sufficient opportunities are most likely to engage in crime or analogous acts. This study tested three hypotheses drawn from the General Theory of Crime. Specifically, this study tested the low self-control to rule-breaking behavior association, self-selection and tested restricted or enhanced opportunities as moderators of the low self-control and rule-breaking link. Early adolescents reported their self-control, unsupervised time, parental solicitation, rules, affiliation with antisocial peers and rule-breaking behavior. Parents reported their perceptions of adolescents' rule-breaking. Lower self-control was associated with more adolescent- but not parent-reported rule-breaking. Lower self-control was linked to more rule-breaking behavior indirectly through unsupervised time, parental solicitation and antisocial peers. Lower self-control was more strongly associated with rule-breaking at higher, as compared to lower, levels of opportunities. Results clarify and extend understanding of the role of restricted or enhanced opportunities in the General Theory of Crime.

Keywords: General Theory of Crime, Low self-control, rule-breaking behavior, opportunities, parent, peer, adolescent

Introduction

According to the General Theory of Crime (Gottfredson & Hirschi, 1990), individuals with lower self-control, when presented with sufficient opportunities, are most likely to engage in crime or analogous acts (e.g., delinquency, smoking, drug and alcohol use). To date, research testing Gottfredson and Hirschi's (1990) theory has focused primarily on the link between self-control and crime and analogous acts, largely ignoring the inclusion of opportunities within the theory. However, opportunities may be particularly relevant during adolescence because adolescents may experience more restrictions in opportunities for crime and analogous acts than adults. The present study considers potential restrictions or enhancements of opportunities for rule-breaking behavior in the context of parent-child and peer relationships as well as youth self-control as additive and interactive predictors of crime and analogous acts.

Self-control and Crime and Analogous Acts

Gottfredson and Hirschi (1990) proposed that individuals with lower self-control are more likely to engage in crime and analogous acts. In psychological research, self-control refers to a person's capacity to override and inhibit socially unacceptable and undesirable impulses and to regulate one's behaviors, thoughts and emotions (Baumeister, Heatherton, & Tice, 1994; Carver, & Scheier, 1998; Muraven & Baumeister, 2000; Tangney, Baumeister, & Boone, 2004). Self-control emphasizes exertion of control over thoughts, emotions, impulses and performance (Baumeister et al., 1994; Tangney et al., 2004). Self-control includes effortful control, which is the process of voluntarily regulating feeling states, as well as delay of gratification which is the capacity to decline immediate, less preferred outcomes to attain more preferred outcomes in the future (Finkenauer, Engels, & Baumeister, 2005). Gottfredson and Hirschi (1990) employ a broad conceptualization of self-control that encompasses the narrower conceptualization of self-

control used in psychological research. In the General Theory of Crime, self-control is conceptualized as a constellation of six characteristics: risk-seeking, preference for physical activities, non-verbal communication, shortsightedness, volatile temper and impulsivity (Grasmick, Tittle, Bursik, & Arneklev, 1993). Other researchers have used analogous behavior as a proxy for self-control under the pseudonym "behavioral self-control" (e.g., DeLisi, 2001; Keane et al., 1993; Polakowski, 1994). This measurement approach contrasts with studies using attitudinal measures of self-control. Such studies use underlying attitudes as indices of self-control and assess self-control independently of antisocial behavior. Using analogous behaviors as an index of self-control is problematic because it is tautological in that it uses one manifestation of self-control to predict another manifestation of self-control (Wright, Caspi, Moffit & Silva, 1999).

Gottfredson and Hirschi (1990) purport that self-control is shaped by parenting in early childhood and remains stable over time. In this framework, individuals with lower self-control are more likely to engage in crime and analogous acts because they tend to consider immediate benefits for themselves while failing to consider the long term consequences of their actions and how their actions may affect others (Gottfredson & Hirschi, 1990). In contrast, individuals with higher levels of self-control are less likely to engage in crime because they consider the consequences associated with antisocial behavior (Gottfredson & Hirschi, 1990).

According to Gottfredson and Hirschi (1990), crimes and analogous acts both entail short-term, immediate pleasure and long-term negative consequences for the actor. Gottfredson and Hirschi (1990) define crime as acts of force or fraud committed for the sake of self-interest. Analogous behaviors are defined as noncriminal acts which are analogous to crime in terms of social reaction (i.e., analogous behaviors and crime are both considered socially unacceptable)

and are manifestations of lower self-control (Gottfredson & Hirschi, 1990). Furthermore, Gottfredson and Hirschi (1990) proposed that lower self-control predicts both crime and analogous acts because the behavioral manifestations of lower self-control are general and not specialized. Indeed, studies have demonstrated that lower self-control is as strongly related to non-criminal deviant behaviors (such as smoking, drinking, accidents, gambling and loitering) as it is related to criminal deviant behaviors (Evans et al., 1997; Jones & Quisinberry, 2004; Paternoster & Brame, 1998). The present study focuses on analogous behavior as an outcome of self-control because the present study draws on an early adolescent community sample. It is likely that individuals from this sample engage in analogous behaviors but that relatively few engage in criminal behavior. Adolescent rule-breaking behavior is consistent with the range of analogous acts to which the General Theory of Crime is applicable. In the current study, rule-breaking behavior is defined as the frequency with which adolescents break rules or get into trouble at home, school or elsewhere, engage in vandalism or theft, cheat, smoke cigarettes or marijuana, and drink alcohol.

A large body of research has linked lower self-control with an array of negative outcomes in support of Gottfredson and Hirschi's (1990) hypothesis that lower self-control individuals have a proclivity towards engaging in antisocial behavior. For example, Pratt and Cullen's (2000) meta-analysis indicated that across 21 empirical studies, including both adult and juvenile samples and operationalizing self-control using both attitudinal and behavioral measures, lower self-control was a robust predictor of crime and analogous acts, yielding a mean effect size of .27. In one study included in the meta-analysis (Wood, Pfefferbaum & Arneklev, 1993), investigators used an attitudinal measure of self-control and found that lower self-control predicted involvement in delinquent behavior such as theft, vandalism and legal substance use

among 975 high school students. In a more recent study, Jones and Quisenberry (2004) assessed the predictive validity of attitudinal self-control for a wide range of behaviors among 254 college students. The investigators found that lower self-control was related to risky driving including driving above the speed limit, following vehicles too closely, driving without a seatbelt and driving while drinking as well as risky sexual behavior including sex with an unfamiliar partner, sex without a condom and number of sexual partners. Given past research linking lower self-control to more antisocial behavior and the role lower self-control is hypothesized to play in the development of antisocial behavior in adolescence according to the General Theory of Crime, the first goal of the current study is to test lower self-control as a predictor of rule-breaking behavior in a sample of middle school students.

Parenting and Peer Relationships as Regulators of Opportunities

Although there are robust links between lower self-control and antisocial behavior, there has been a relative lack of research examining opportunities in the General Theory of Crime framework (Pratt & Cullen, 2000). Opportunities are situations that present themselves to individuals by which these individuals can satisfy needs with minimal mental or physical effort (Gottfredson & Hirschi, 1990). Accordingly, the second goal of the present study was to test parents and peers as regulators of youths' opportunities for rule-breaking behavior. Parents may amplify youths' opportunities for rule-breaking behavior by allowing adolescents to spend more time outside of adult supervision, failing to solicit information about youths' whereabouts and activities, and setting few rules restricting youths' behavior. Also, adolescents who are more involved with antisocial peers have greater opportunities for rule-breaking behavior.

Parents or other authority figures (e.g., teachers) are responsible for supervising and disciplining adolescents, although supervision decreases with age (Laird, Criss, Pettit, Bates, &

Dodge, 2009). Situations in which adolescents spend time unsupervised by adults are conducive to antisocial behavior because the lack of structure provides time available for antisocial behavior and the absence of authority figures reduces the potential for someone to exercise social control in response to adolescent antisocial behavior (Osgood, Wilson, Bachman, O'Malley, & Johnston, 1996). Indeed, adolescents who spend more time outside of adult supervision are more likely to engage in antisocial behavior (Osgood & Anderson, 2004; Osgood et al., 1996; Cohen, Farley, Taylor, Martin & Schuster, 2002). Thus, the amount of time adolescents spend unsupervised by adults will serve as an index of opportunity, with more unsupervised time indicating more opportunity for rule-breaking behavior.

Parental knowledge of adolescents' whereabouts and activities protects youth from engaging in antisocial behavior in middle childhood and adolescence (Crouter & Head, 2002; Dishion & McMahon, 1998; Pettit, Laird, Dodge, Bates, & Criss, 2001). Parental knowledge was thought to result from monitoring behaviors but Stattin and Kerr (2000) showed that adolescent disclosure rather than parental monitoring or solicitation of information is the primary source of parental knowledge. However, adolescent disclosure may be an indicator of self-control rather than an index of opportunity (Laird & Marrero, 2010). Parental solicitation of information from youth, in contrast, can be considered monitoring behavior and an external restrictor of opportunity. Thus, the present study considers adolescents' perceptions of parents' solicitation of information as an index of opportunity, with more parental solicitation representing more restriction.

Parental rules are meant to provide adolescents with guidance regarding appropriate behavior. Youth obedience is more likely to occur when parents set clear rules (Grusec & Goodnow, 1994). Furthermore, clear rules and prohibitions, when followed by adolescents, may

limit opportunities for risk-taking behavior such as risky driving, smoking cigarettes, and sexual intercourse (Beck, Hartos, & Simons-Morton, 2006; Guilamo-Ramos, Jaccard, Dittus, & Bouris, 2006; Mott, Crowe, Richardson & Flay, 1999). Conversely, few rules lead to risk taking behavior such as early sexual activity (Wight, Williamson, & Henderson, 2006). Therefore, the present study considers more rules as an indicator of more opportunity restrictions. Adolescents whose parents set more rules are hypothesized to have less opportunity to engage in rule-breaking behavior.

While Gottfredson and Hirschi (1990) downplay the influence of other individuals on crime, they also note that adolescents tend to commit crimes in groups. Indeed, adolescents are more likely than adults to engage in antisocial behavior with or when surrounded with their peers (Zimring, 1998). Involvement with antisocial peer groups places youth at increased risk for substance abuse, illegal behavior, violence and other negative outcomes (Dishion, Andrews & Crosby, 1995; Dishion, Capaldi et al., 1995; Dishion et al., 1997; Dishion, Nelson, Winter & Bullock, 2004; Dishion, Spracklen, Andrews & Patterson, 1996; Granic & Dishion, 2003; Patterson, Dishion & Yoerger, 2000; Piehler & Dishion, 2007; Poulin, Dishion & Haas, 1999). Antisocial peers influence youth to engage in antisocial behavior both by reinforcing such behavior and by providing opportunities for youth to engage in antisocial behavior (Hiatt & Dishion, 2007; Nelson & Dishion, 2004; Osgood et al., 1996). From a social learning theory perspective, adolescents learn antisocial behavior through modeling, imitation and reinforcement of antisocial peers (Thornberry & Krohn, 1997). Deviant peer groups “train” youth in new forms of antisocial and aggressive behavior and reinforce antisocial behavior (Dishion, Andrews, Kavanagh & Soberman, 1996; Dishion, Eddy, Haas, Li & Spracklen, 1997). The present study considers more involvement with antisocial peers as an index of greater opportunity for rule-

breaking behavior. Adolescents who are more involved with antisocial peers are expected to have more opportunity to engage in rule-breaking behavior.

Restricted or Enhanced Opportunities as Self-Selection

Gottfredson and Hirschi (1990) presented two contrasting hypotheses. The first hypothesis they proposed is that individuals with lower self-control will self-select into greater opportunities for antisocial behavior due to their lower self-control. Gottfredson and Hirschi (1990) de-emphasize the role of restricted or enhanced opportunities in predicting antisocial behavior because they argue that self-control leads people to self-select into opportunities. That is, individuals with lower self-control are hypothesized to actively seek-out environments and relationships conducive to crime due to their lower self-control and thus the association between opportunities and crime and analogous acts is spurious because self-control causes both opportunities and crime. Thus, the General Theory of Crime downplays the role that other individuals may have in reducing or amplifying opportunities for committing crime because Gottfredson and Hirschi (1990) assert that lower self-control is the primary individual-level cause of crime. Lower self-control is purportedly responsible for social consequences such as failure to form positive social relationships and to succeed in social institutions (Gottfredson & Hirschi, 1990). Social consequences that individuals with lower self-control experience put them at risk for peer rejection and establishing relationships with deviant peers, thereby providing them with more opportunity for risk-taking behavior (Gottfredson & Hirschi, 1990). Also, opportunity restrictions that may be imposed by family or peer relationships are hypothesized to be in response to self-control (Gottfredson & Hirschi, 1990). For example, youth with higher levels of self-control may choose to affiliate with prosocial peers, who may provide higher self-

control youth with restricted opportunities for antisocial behavior because prosocial peers are less likely to support antisocial behavior (Dishion et al., 2004).

In terms of the opportunities in the present study, self-selection due to lower self-control into more unsupervised time, less parental solicitation, fewer rules and more involvement with antisocial peers may be through several different processes. For example, youth with lower self-control are more likely to exhibit behavior problems (Jones & Quisinberry, 2004; Wood et al., 1993) and parents of youth with behavior problems tend to "give up" their efforts to monitor and set limits on their youth's behavior (Dishion et al., 2004; Granic, Dishion & Hollenstein, 2003). Also, antisocial youth are likely to deter parental monitoring in order to gain more unsupervised time (Dishion et al., 2004). Lack of parental involvement in and monitoring of adolescents' behaviors and activities provides adolescents with more opportunity for antisocial behavior and this exacerbates adolescents' behavioral problems (Dishion, Capaldi, Spracklen & Li, 1995; Dishion et al., 2004; Dishion & McMahon, 1998; Dishion & Stormshak, 2007; Patterson & Dishion, 1985). Thus, lower self-control youth who exhibit behavior problems may self-select into greater opportunities for rule-breaking behavior by deterring parents from providing supervision, asking youth about their whereabouts and activities, and setting rules restricting youths' behavior. Furthermore, lower self-control youth are hypothesized to be more vulnerable to pathogenic relationship dynamics and more likely to form relationships with deviant peer cliques (Wills & Dishion, 2004). In sum, lower self-control youth may self-select into greater opportunities for rule-breaking behavior by forming relationships with antisocial peers.

Because youth with lower self-control are more likely to have behavior problems (Jones & Quisinberry, 2004; Wood et al., 1993), self-control may be a factor in a developmental dynamic wherein parents of high-risk adolescents reduce their involvement and guidance when

confronted with challenges of problem behavior. A study assessed this process longitudinally using coder impressions of family management practices based on observations of live videotaped parent-adolescent interaction tasks in a sample of boys between ages 10 – 18 (Dishion, Nelson, & Bullock, 2004). Parents of antisocial boys (i.e., boys who were arrested at least once by the age of 14 and had more than two arrests as juveniles) decreased family management, including less positive parenting, a poorer parent-child relationship and less monitoring around early to middle adolescence while parents of well-adjusted boys (i.e., boys who were never arrested and scored below the mean for the full sample on an antisocial behavior construct) maintained high levels of family management through adolescence (Dishion et al., 2004). Because youth with lower self-control exhibit high levels of behavior problems (Jones & Quisinberry, 2004; Wood et al., 1993) and because high levels of behavior problems lead to reductions in parental monitoring attempts (Dishion et al., 2004), it may be that youths with lower self-control experience more unsupervised time, less parental solicitation and fewer rules due to their parents' disengagement from lower self-control youths. Also in support of the self-selection hypothesis, Evans, Cullen, Burton, Dunaway and Benson (1997) analyzed a cross-sectional sample of 555 adults aged 18 years or older (Median age = 40.5). Evans et al. (1997) assessed whether social consequences including failure to establish successful social bonds were outcomes of self-control or could combine additively with self-control to predict criminal involvement. Results indicated that lower self-control was related to poorer quality friendships and family relationships and involvement with criminal friends. Further, the quality of friendships and family relations did not predict criminal involvement (Evans et al., 1997). These results support the hypothesis that individuals with lower self-control self-select into greater

opportunities for rule-breaking behavior due to their lower self-control and that opportunities are not causally related to antisocial behavior.

Consistent with the hypothesis that lower self-control causes individuals to self-select antisocial peers, a three-year longitudinal study found that lower self-control predicted the selection of substance using friends in a sample of 1,277 early adolescents (Wills & Cleary, 1999). Similarly, Wright et al. (1999) analyzed the effect of childhood and adolescent self-control on adolescent and young adult social bonds using data from the Dunedin study in New Zealand that followed participants from birth through age 21. Self-control was measured from multiple sources including participants, parents, other family members, friends, teachers and trained observers using a measure of self-control consistent with Gottfredson and Hirschi's (1990) conceptualization of the self-control construct. Results indicated that participants with lower self-control at childhood and adolescence had more delinquent peers at ages 18 and 21, suggesting that lower self-control is an important predictor of selecting antisocial peers.

In sum, most of the studies that found support for the self-selection hypothesis suggest that opportunities do not predict antisocial behavior after controlling for self-control. In other words, the studies indicate that the relation between opportunities and antisocial behavior is spurious and due to lower self-control. However, Jones Cauffman and Piquero (2007) and Evans et al. (1997) found important evidence that is inconsistent with the hypothesis that the relation between opportunities and crime is spurious and due to lower self-control. Jones et al. (2007) found main and moderating effects for parental support and self-control using an attitudinal self-control measure that indexed impulse control and risk-seeking traits in a sample of 248 incarcerated juvenile offenders ages 12 to 22 years. Specifically, the effect of parental support remained significant when self-control was included in the same analysis, contrary to

Gottfredson and Hirschi's (1990) hypothesis that opportunities are only a reflection of self-control. Evans et al. (1997) found that involvement with criminal friends had a significant effect on delinquent offenses when self-control was included in the same analysis, also in contrast to Gottfredson and Hirschi's (1990) hypothesis that the relationship between opportunities and crime is spurious and due to lower self-control. The present study tested Gottfredson and Hirschi's (1990) self-selection hypothesis by examining whether lower self-control youth would self-select into more opportunities for rule-breaking behavior, including more unsupervised time, less parental solicitation, fewer rules and more involvement with antisocial peers.

According to Gottfredson and Hirschi (1990), self-control develops in early childhood and is the result of ineffective parenting. Specifically, Gottfredson and Hirschi (1990) argue that for children to learn self-control, parents must monitor their children's behavior, notice and correct or punish antisocial behavior when it occurs, show affection for the children, and cultivate a strong parent-child bond. The current study conceptualizes parenting practices as restrictors or providers of opportunities that are similar to the parenting practices that Gottfredson and Hirschi contend influence the development of self-control. Because the parenting practices that the current study conceptualizes as restrictors or providers opportunities are likely related to the parenting practices in early childhood that are hypothesized to influence the development of self-control, it also will be important to confirm that self-control predicts rule-breaking behavior when controlling for restricted or enhanced opportunities.

Restricted or Enhanced Opportunities as Moderators of the Link between Self-control and Rule-breaking Behavior

Gottfredson and Hirschi's (1990) second hypothesis regarding self-control is that opportunities will moderate self-control such that lower self-control will be more strongly

associated with crime and analogous behaviors when there are more opportunities for crime and analogous behaviors than when there are fewer opportunities. In the present study, each of the indices of opportunity are proposed to moderate self-control such that lower self-control will be more strongly associated with rule-breaking behavior among adolescents with more unsupervised time, less parental solicitation, fewer rules and more involvement with antisocial peers than among adolescents with less unsupervised time, more parental solicitation, more rules and less involvement with antisocial peers.

The few studies testing Gottfredson and Hirschi's (1990) moderation hypothesis do indicate that adolescents with low self-control who have more opportunities such as more unsupervised time, less informed parents and fewer rules may be especially likely to engage in antisocial behavior. For example, using a measure that indexed characteristics of lower self-control including impulsivity, risk-taking, carelessness, temper and present-orientedness, LaGrange and Silverman (1999) observed main effects and an interaction for lower self-control and opportunities in a sample of 2,095 male and female youth between ages 11-18. Specifically, lower self-control, parental supervision and unsupervised time with peers combined additively to predict general delinquency. Also, lower self-control was more strongly associated with delinquent offenses among youth with more unsupervised time, poorly informed parents, and fewer rules than among youth with more restricted opportunities. LaGrange and Silverman (1999) concluded that self-control alone does not fully explain crime and that opportunities are important. Similarly, Jones et al. (2007) found that parental support was more effective in minimizing antisocial behavior among youth low in impulse control and high in risk-seeking than among youth with high impulse control and low risk-taking (Jones, Cauffman, & Piquero, 2007). Consistent with the hypothesis that more involvement with antisocial peers in

combination with lower self-control will be associated with higher levels of rule-breaking behavior, prior longitudinal research found that after controlling for antisocial behavior at age 17, antisocial peer involvement at age 17 significantly predicted antisocial behavior at age 19 among youth with low or average levels of self-control at age 17 but not among youth with higher self-control (Gardner, Dishion, & Connell, 2008). Thus, based on prior research less involvement with antisocial peers is expected to moderate the association between lower self-control and more rule-breaking behavior such that lower self-control will be more strongly linked to rule-breaking behavior when there are many opportunities.

Prior research indicates that more opportunities interact with lower self-control to increase youths' involvement in antisocial behavior. Thus, a third goal of this study was to test whether restricted or enhanced opportunities moderate the link between self-control and rule-breaking behavior. It is expected that youth with lower self-control and more opportunities including more unsupervised time, less parental solicitation, more rules and more involvement with antisocial peers will exhibit higher rates of rule-breaking behavior than youth with higher self-control or youth with more restricted opportunities.

The purpose of the current study was to test the direct and indirect effects of self-control on rule-breaking behavior and the combined effect of self-control and restricted or enhanced opportunities on rule-breaking behavior among an early adolescent sample. There are three reasons to study this process during early adolescence. First, based on the General Theory of Crime (Gottfredson & Hirschi, 1990), self-control is established by early childhood so self-control is expected to be stable by early adolescence. Second, Collins (1995) identified the convergence of pubertal maturation, cognitive maturation and intensified environmental stressors resulting from age-graded transitions and expectations such as the middle school transition as the

impetus for a renegotiation of the parent-adolescent relationship. Early adolescence may be a period in which there is an expansion of opportunities for adolescents because at this age adolescents become more autonomous and spend more time outside of the family context (Keijsers, Branje, VanderValk & Meeus, 2010). Thus, the middle school transition which occurs in early adolescence is a transitional period in terms of how much parents and peers restrict or expand youths' opportunities. Third, antisocial behavior often escalates during early adolescence (Moffit & Caspi, 2001).

Sex, race and socioeconomic status are included as control variables in all analyses. Sex is included as a control variable because Gottfredson and Hirschi (1990) assert that males are more likely than females to commit crime and analogous acts. Indeed, sex differences in crime rates are widely cited in the literature (LaGrange & Silverman, 1999). Race is included as a control because Gottfredson and Hirschi (1990) point out that there are differences in crime across racial groups. Indeed, there is disproportionate minority representation among youth within the juvenile justice system (Vazsonyi & Chen, 2010). For example, African American youths are 1.8 times more likely than European American youths to be arrested and 2.9 times more likely to be detained (Vazsonyi & Chen, 2010). However, European American youth have higher rates of certain types of offenses such as vandalism and alcohol use (Vazsonyi & Chen, 2010). There is mixed evidence regarding whether racial differences in crime rates are due to discrimination against minorities or behavioral differences in offending among minority populations (Vazsonyi & Chen, 2010). Socioeconomic status is included as a control variable because low parental education level is associated with adolescent violence, property, traffic and drunk-driving offenses (Sourander et al., 2006).

The current study utilized both parent- and adolescent-reports of rule-breaking behavior. Adolescents are likely to be most informed about their own involvement in rule-breaking behavior (Laird, Marrero, & Sentse, 2010) but the use of multiple informants provided an opportunity to test whether findings generalize across parents' and adolescents' perceptions of rule-breaking behavior.

Statement of the Problem

Although the General of Theory of Crime has received some empirical support, the current study addressed two limitations from prior research. First, Gottfredson and Hirschi's (1990) hypothesis that opportunities are not causally related to crime and analogous acts and instead are just another manifestation of self-control is not consistent with some evidence that more opportunities are associated with higher rates of antisocial behavior. Second, only a few studies have tested the hypothesis that opportunities moderate the association between self-control and antisocial behavior. This is an important focus of research because elucidating the role of opportunities in facilitating antisocial behavior has important implications for intervention and prevention programs. Discerning whether opportunities are merely responses to self-control or whether lower self-control youth self-select into more opportunities for rule-breaking behavior and thereby increase their risk for antisocial behavior suggests alternate intervention/prevention strategies.

This study examined parents and peers as regulators of adolescents' opportunities. Indicators of greater opportunities for rule-breaking behavior included more unsupervised time, less parental solicitation, fewer rules and more adolescent involvement with antisocial peers. Lower self-control adolescents were expected to have more opportunities than higher self-control adolescents. Furthermore, lower self-control was expected to be more strongly associated with

more rule-breaking behavior when adolescents have greater opportunities for antisocial behavior than when adolescents have fewer opportunities for antisocial behavior.

This study tested several specific hypotheses:

Hypothesis 1: This study tested the main effect of self-control on rule-breaking behavior. Lower self-control was hypothesized to be associated with more rule-breaking behavior.

Hypothesis 2: This study tested self-selection as evidenced by a significant indirect effect linking self-control and rule-breaking behavior through the opportunity variables. An indirect effect from self-control to rule-breaking behavior through opportunities was hypothesized.

Hypothesis 2a: A significant association between self-control and unsupervised time was hypothesized. A significant indirect effect from self-control to rule-breaking behavior through unsupervised time was hypothesized.

Hypothesis 2b: A significant association between self-control and parental solicitation was hypothesized. A significant indirect effect from self-control to rule-breaking behavior through parental solicitation was hypothesized.

Hypothesis 2c: A significant association between self-control and rules was hypothesized. A significant indirect effect from self-control to rule-breaking behavior through rules was hypothesized.

Hypothesis 2d: A significant association between self-control and antisocial peers was hypothesized. A significant indirect effect from self-control to rule-breaking behavior through antisocial peers was hypothesized.

Hypothesis 3: This study tested whether opportunity restrictions moderate the link between self-control and rule-breaking behavior. Restrictions were hypothesized to moderate

self-control such that lower self-control was expected to be more strongly associated with rule-breaking behavior when opportunities are high than when opportunities are low.

Hypothesis 3a: Lower self-control was hypothesized to be more strongly associated with rule-breaking behavior among youth with more unsupervised time than among youth with less unsupervised time.

Hypothesis 3b: Lower self-control was hypothesized to be more strongly associated with rule-breaking behavior among youth who experienced less parental solicitation than among youth with more parental solicitation.

Hypothesis 3c: Lower self-control was hypothesized to be more strongly associated with rule-breaking behavior among youth whose parents imposed fewer rules restricting youths' behavior than among youth with more rules.

Hypothesis 3d: Lower self-control was hypothesized to be more strongly associated with rule-breaking behavior among youth with more antisocial peers than among youth with fewer antisocial peers.

Method

Participants

The current study included 180 early adolescents interviewed in 2007 (M = 12.04 years, SD = .78; Range = 10.73 – 14.76) and 2008. The sample was 49.4% female and participants primarily resided in two-parent family units (74.4%). Forty-nine percent of parents were White non-Hispanic, 45% were African American, and 6% were other ethnicities. Most of the mothers were well educated (20% held a graduate degree, 31.7% a bachelor's degree, 33.3% attended college or technical school, 11.1% held a high school diploma, and 3.4% did not complete high school). Sample demographics were similar to Census 2000 data regarding parent marital status

of households with children ages 6- 17 years (68% two-parent households in the community from which participants were recruited). Also, the racial distribution in the sample was comparable with National Center for Educational Statistics enrollment figures for the school district (47.2% European American & 49.6% African American). Data were collected over a 2-year period beginning during the third wave of the larger longitudinal study. Thirty-eight participants had dropped out of the study prior to wave three. Attrition was primarily due to residential mobility. Ongoing participants did not differ from dropouts on level of maternal education, $t(215) = .73$, $p = .47$, parent marital status, $X^2(1, n = 216) = 2.49$, $p = .12$, or adolescent sex, $X^2(1, n = 218) = 1.54$, $p = .21$. However, the retention rate was lower for African American participants (76%) than for European American (89%) or other participants (85%), $X^2(2, n = 218) = 7.10$, $p = .03$.

Procedures

Participating adolescents were drawn from the Baton Rouge Families and Teens Project, a longitudinal study of parent-adolescent relationships. Two successive cohorts totaling 218 families were recruited in a Louisiana city of approximately 400,000 people in 2006 and 2007. Letters soliciting participation and describing data collection procedures were distributed to students at school. Parents willing to participate in home interviews returned postcards to the researchers or forms to adolescents' schools indicating their interest. All youth and parent participants were compensated $25 to $45. Participants were interviewed in their homes by undergraduate or graduate student interviewers following adolescents' 5^{th}, 6^{th} and 7^{th} grades. Researchers obtained active parental consent and youth assent for research prior to conducting 45-minute structured interviews. To maintain privacy, participants were interviewed in a private location and personally recorded their responses to the questions on an answer sheet. Self-control

and rule-breaking behavior data reported in the current study were collected during interviews in the summer of 2008 (i.e., the post-6th grade interview with the younger cohort and the post-7th grade interview with the older cohort) because this was the first time that the items on self-control were included in the interview protocols. Rule-breaking behavior data from interviews one year earlier (i.e., 2007; post 5th and 6th grades for the younger and older, cohorts, respectively) were included in analyses as indices of previous rule-breaking behavior.

Measures

Self-control. Adolescents reported their self-control using the 24-item (e.g., "I often act on the spur of the moment without stopping to think") Low Self-control Scale (Grasmick, Tittle, Burisk, & Arneklev, 1993). The items were developed to assess the six dimensions of trait self-control (i.e., risk seeking, preference for physical activities, non-verbal communication, shortsightedness, volatile temper and impulsivity) described by Gottfredson and Hirschi (1990). Vazsonyi and Belliston (2007) used these items to assess self-control in a population of 15 - 20 year olds from Hungary, Japan, the Netherlands, Switzerland and the United States. Adolescents were able to respond to the items in a reliable fashion and the youth who reported lower self-control also reported less parental monitoring. In the current study, each item was scored on a four-point scale from *strongly disagree* (scored 1) to *strongly agree* (scored 5). To facilitate interpretation, the self-control scores were reverse scored so that higher scores represent higher, rather than lower, levels of self-control. The mean of the 24 items was computed to index *self-control* (α = .88)

Unsupervised time. Adolescents reported the amount of time they spend outside of adult supervision using seven items newly developed for this study. The items assess how often adolescents watched TV or movies or listened to music with no adult around, stayed at home

when no adult was there, hung out at a friend's house with no adult present, hung out at home in a place where no adult could bother them, spent time on-line with no adult around, and talked or instant messaged on the phone (land or cell) with no adult around. Adolescents responded to each item using a five-point response scale ranging from *never* (scored 0) to *every day* (scored 4). The mean of the six items was computed to index *unsupervised time* ($\alpha = .65$)

Parental solicitation. To assess adolescents' perceptions of parental solicitation, the solicitation items described by Stattin and Kerr (2000) were employed after slightly modifying their original items to make the items appropriate for the present study's early adolescent sample. Modifications included changing items that asked about adolescents' activities at night to ask about the adolescents' free time. Keijsers et al. (2010) used Stattin and Kerr's (2000) items to assess parental solicitation in a population of 13 – 16 year olds. Adolescents were able to respond to the items in a reliable fashion and solicitation was correlated with parental knowledge, adolescent disclosure and parental control. In the current study, adolescents responded to five items ("e.g., during the past month, how often has your mother started a conversation with you about your free time?") using a six-point scale from *never* (scored 0) to *almost every day* (scored 5). The mean of the five responses indexes *parental solicitation (*α *=.79).*

Rules. Seven items assessed the presence of rules for adolescents' behavior around the home and with friends (i.e., "the types of movies you watch or music you listen to, how you spend your free time, hanging out at a friends' house when no adult is there, what you can or cannot do with friends, and who you can or cannot be friends with, who can or cannot be your boyfriend or girlfriend, what websites you can or cannot visit"). Laird, Criss, Pettit, Bates and Dodge (2009) used similar items to assess rules in a population of 10 – 16 year olds. Adolescents

were able to respond to the items in a reliable fashion and the youth who reported more rules also reported less peer antisociality and there were reductions in family rules over the course of adolescence. In the current study, adolescents responded to each item by indicating the presence of a rule. Affirmative answers were counted to index *rules* (α = .58)

Antisocial peers. Adolescents' described their friends' involvement in antisocial behavior using items adapted from Dishion, Patterson, Stoolmiller and Skinner (1991). Laird, Pettit, Dodge and Bates (2007) used these items to assess antisocial peer involvement in a population of 12 and 13 year olds. Adolescents were able to respond to the items in a reliable fashion and the youth who reported more antisocial peers also reported more antisocial behavior. In the current study, adolescents responded to 10 items (e.g., gets into fights, gets into trouble at school) using a four-point response scale ranging from *never* (coded as 1) to *all the time* (coded as 4). An *antisocial peer affiliation* score was computed as the mean of the 10 items (α = .75).

Adolescent-reported rule-breaking. Adolescents reported the frequency of their involvement in rule-breaking behavior using the Problem Behavior Frequency Scale (PBFS; Farrell, Kung, White, & Valois, 2000) and the Teen Conflict Survey (TCS; Bosworth & Espelage, 1995). Items from the PBFS assessing physical and non-physical aggression were excluded because the aggression items closely overlap with the conceptualization and operationalization of self-control. Twelve PBFS items assessing delinquency (e.g., "in the last month, how many times did you steal from someone?") and alcohol, tobacco and drug use were combined with six TCS items (e.g., In the last month of school, how many times did you break a rule at home?") assessing rule-breaking behavior in the home, school, and other contexts. Weaver and Prelow (2005) used the Problem Behavior Frequency Scale to assess problem behaviors in an ethnically diverse sample of 12 – 15 year olds. Adolescents were able to respond

to the items in a reliable fashion and the youth who reported more problem behaviors also reported more involvement with deviant peers. Bosworth and Espelage (1995) developed the Teen Conflict Survey to assess rule breaking behavior in middle school students and showed that adolescents were able to respond to the items in a reliable fashion. In the current study, each item was scored on a five-point scale from *never* (scored 0) to *7 or more times* (scored 4). The mean of the 18 items was computed to index *adolescent-reported rule-breaking behavior* (α = .87).

Parent-reported rule-breaking behavior. Parents reported their adolescents' rule breaking behavior at home, school and in other contexts using the six item Teen Conflict Survey (Bosworth & Espelage, 1995). The TCS items were scored on a five-point scale ranging from *never* (scored 0) to *7 or more times* (scored 4) in the past 30 days. The mean of the 6 items was computed to index *parent-reported rule-breaking behavior* ($\alpha = .81$).

Analysis Plan

Hypothesis one. To test hypothesis one, a bivariate correlation was computed. The association between self-control and rule-breaking behavior was also tested using multiple regression controlling for sex, race and SES. Results will support the hypothesis if there is a significant negative association between self-control and rule-breaking behavior.

Hypothesis two. To test hypothesis two, a series of path models were employed using regression equations to test indirect effects of self-control on antisocial behavior through each opportunity variable and the direct effect of self-control on each opportunity variable. Figure 1 shows the indirect effect model. The purpose of the analysis was to test whether opportunities can account, at least in part, for the relation between lower self-control and more rule-breaking behavior. It was expected that lower self-control would be associated with rule-breaking behavior indirectly through its association with self-selection into more opportunities which then

is associated with rule-breaking behavior. Path models were fit to examine the indirect effect from self-control to antisocial behavior through opportunities. Path values were estimated by calculating two regression equations. The first regression assessed whether the predictor, self-control, is associated with the mediator, opportunity. For example, the first regression assessed whether self-control is associated with unsupervised time. The second regression assessed whether the independent variable, self-control, and the opportunity mediator were associated with the dependent variable, rule-breaking behavior. For example, the second regression assessed whether self-control and unsupervised time were associated with rule-breaking behavior. Interpretation focused on the link between self-control and opportunities (path A). Path A is the most essential piece of the path model according to Gottfredson and Hirschi's (1990) hypothesis. For path A, a significant association showing that lower self-control is associated with more opportunities would be consistent with Gottfredson and Hirschi's (1990) hypothesis. For the other two paths in the model, two scenarios would be consistent with Gottfredson and Hirschi's (1990) hypothesis. First, if there are significant correlations between opportunities and rule-breaking behavior (path C) and between self-control and opportunities (path A) but the association between opportunities and rule-breaking behavior does not remain after controlling for self-control (path B), results would be consistent with Gottfredson and Hirschi's (1990) hypothesis. Self-control would be accounting for the effects of opportunities. In other words, this pattern would be consistent with the conclusion that the relationship between opportunities and crime is spurious and due to lower self-control because opportunities do not uniquely contribute to rule-breaking behavior after including control for self-control. Second, a significant indirect effect model would also be consistent with Gottfredson and Hirschi's (1990) hypothesis. Specifically, if the indirect path from self-control to rule-breaking behavior through opportunities

is significant then it can be concluded that individuals with lower self-control self-select into more opportunities and thereby increase their risk for rule-breaking behavior. Bootstrapping was used to estimate confidence intervals for the indirect effect (McCartney, Burchinal, & Bub, 2006). The null hypothesis of no indirect effect can be rejected if the bootstrapped confidence interval does not contain zero (McCartney et al., 2006). Analyses were conducted controlling for prior antisocial behavior, sex, race and SES.

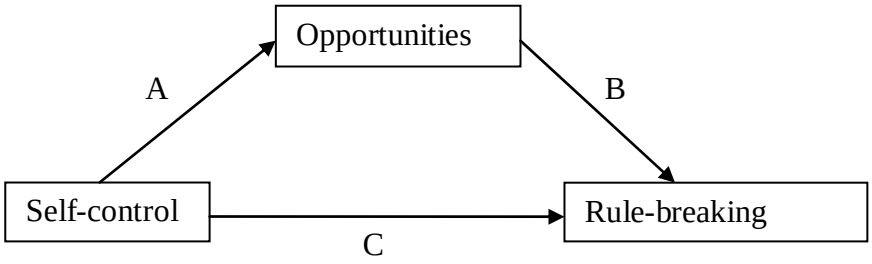

Figure 1. Indirect effect model from self-control to rule-breaking behavior through opportunities.

Hypothesis three. To test hypothesis three, a series of multiple regression analyses were conducted to assess whether opportunities moderate the association between self-control and rule-breaking behavior. The purpose of the analysis is to test whether more opportunities increase the strength of the relation between lower self-control and more rule-breaking behavior. For example, in the first analysis rule-breaking behavior in 2008 was regressed on rule-breaking behavior in 2007, self-control, unsupervised time, the Self-Control X Unsupervised Time interaction, sex, race and SES. Post hoc probing of significant interactions was performed as suggested by Cohen et al. (2003). If significant interaction effects are found, such as the interaction shown in Figure 2, showing that lower self-control is more strongly associated with rule-breaking behavior when opportunities are high, results would be consistent with Gottfredson and Hirschi's (1990) hypothesis that opportunities moderate the effect of self-control on rule-

breaking behavior. Results would indicate that the effect of lower self-control on rule-breaking behavior becomes stronger as opportunities increase.

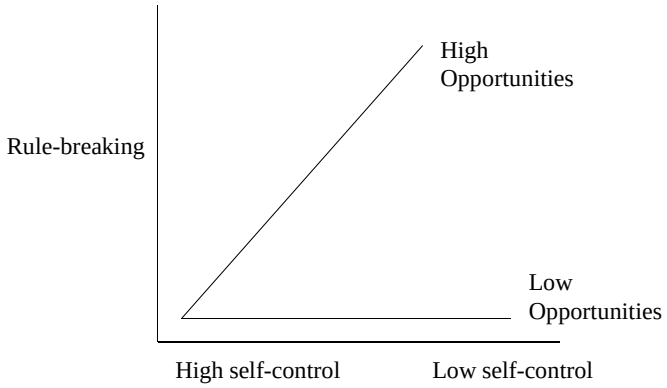

Figure 2. Hypothesized Interaction between low self-control and more opportunities predicting rule-breaking.

Results

There are four sections of results. The first section reviews descriptive statistics and bivariate correlations as a foundation for testing the hypotheses of interest. The second section reviews a set of correlations and regressions linking self-control and antisocial behavior as tests of hypothesis one. The third and fourth sections review a series of regression analyses testing hypotheses two and three.

Descriptive Statistics and Bivariate Correlations

Descriptive statistics and bivariate correlations are shown in Tables 1 and 2. The mean level of self-control corresponded to a *neutral* score of self-control. The mean level of rule-breaking behavior was in the low range, corresponding to a score of most adolescents having *never* engaged in rule-breaking behavior. Lower self-control was associated with more

concurrent and prior rule-breaking behavior. Self-control was associated with all of the opportunity variables. Specifically, lower self-control was associated with more unsupervised time, less parental solicitation, fewer rules and more involvement with antisocial peers. Lower self-control was associated with higher mother education and being male but self-control did not differ across ethnicity groups. The opportunities variables were intercorrelated to a modest degree. More unsupervised time, less parental solicitation, fewer rules and more involvement with antisocial peers were associated with more rule-breaking behavior at both time points.

Hypothesis One

The first hypothesis focuses on the association between lower self-control and more rule-breaking behavior. Two pieces of evidence are relevant to hypothesis one. The first piece of evidence relevant to hypothesis one is the bivariate correlations between self-control and rule-breaking behavior mentioned previously. The bivariate correlations between self-control and rule-breaking behavior were all significant and in the expected direction.

The second piece of evidence relevant to hypothesis one is the association between self-control and rule-breaking behavior controlling for sex, race, socioeconomic status (SES) and prior rule-breaking behavior. Rule-breaking behavior in 2008 was regressed on rule-breaking behavior in 2007, self-control, sex, race and SES. Table 3 shows that controlling for sex, race, SES and prior rule-breaking behavior, lower self-control was associated with more adolescent-reported rule-breaking behavior. However, self-control was not associated with parent-reported adolescent rule-breaking behavior after controlling for rule-breaking behavior in 2007, sex, race and SES.

Hypothesis Two

Hypothesis two is that there will be an indirect effect from self-control to rule-breaking behavior through opportunities. For hypothesis two, there are four relevant pieces of information. First, the associations between self-control and opportunities were tested controlling for sex, race and SES (Table 4). Each opportunity variable was regressed on self-control, sex, race, SES and prior rule-breaking behavior to test these associations. The associations between self-control and opportunities are relevant to the self-selection hypothesis. Second, the associations between the opportunity variables and rule-breaking behavior were tested controlling for sex, race, SES and prior rule-breaking behavior. In a series of four analyses, rule-breaking behavior was regressed on each of the opportunity variables, sex, race, SES and prior rule-breaking behavior (Tables 5 and 6). Third, the indirect effects from self-control to rule-breaking behavior through each opportunity variable were assessed using bootstrapped standard errors (Table 7). The analyses used 1,000 bootstrapped samples. Table 7 shows the mean indirect effect over that 1,000 samples as well as the standard error around that mean and the bias-corrected 95% confidence interval for that mean. If zero is contained within the confidence interval, then the p-value is greater than .05. Finally, analyses tested whether the opportunity variables remained significant predictors of rule-breaking behavior after controlling for self-control. The association between opportunities and rule-breaking behavior after controlling for self-control is relevant to the spuriousness hypothesis.

Unsupervised time. The path from self-control to unsupervised time was significant such that lower self-control was associated with more unsupervised time after controlling for sex, race, SES and prior rule-breaking behavior (see Table 4). The path from unsupervised time to rule-breaking behavior was significant for adolescent-reported (see Table 5) but not parent-reported (see Table 6) rule-breaking behavior such that more unsupervised time was associated

with more adolescent-reported rule-breaking behavior controlling for prior antisocial behavior, sex, race and SES. The indirect effect from self-control to antisocial behavior through unsupervised time was significant for adolescent-reported but not parent-reported rule-breaking behavior (see Table 7). Self-control remained a significant predictor of adolescent-reported rule-breaking behavior when unsupervised time was in the model controlling for prior rule-breaking behavior, sex, race and SES. However, self-control was not a significant predictor of parent-reported rule-breaking behavior when unsupervised time was in the model. Results showing that lower self-control is associated with more unsupervised time are consistent with hypothesis two. Also, the significant indirect effect from self-control to adolescent-reported rule-breaking behavior through unsupervised time is consistent with hypothesis two.

Parental solicitation. The path from self-control to parental solicitation was significant such that lower self-control was associated with less parental solicitation (see Table 4). Less parental solicitation was associated with more adolescent-reported rule-breaking behavior (see Table 5) but not with more parent-reported rule-breaking behavior (see Table 6). The indirect effect from self-control to rule-breaking behavior through parental solicitation was significant for adolescent-reported rule-breaking behavior but not for parent-reported rule-breaking behavior (see Table 7). Self-control remained a significant predictor of adolescent-reported rule-breaking behavior when parental solicitation was in the model. Self-control was not a significant predictor of parent-reported rule-breaking behavior. Results showing that lower self-control was associated with less parental solicitation are consistent with hypothesis two. Also, the significant indirect effect from self-control to adolescent-reported rule-breaking behavior through parental solicitation is consistent with hypothesis two.

Rules. The path from self-control to rules was not significant (see Table 4). The path from rules to rule-breaking behavior was significant for adolescent-reported (see Table 5) antisocial behavior but not for parent-reported rule-breaking behavior (see Table 6). The indirect effect from self-control to rule-breaking behavior through rules was not significant in any analysis (see Table 7). Self-control remained a significant predictor of adolescent-reported rule-breaking behavior when rules was in the model. Self-control was not a significant predictor of parent-reported rule-breaking behavior when rules was in the model. Results showing that lower self-control was not associated with rules are not consistent with hypothesis two. The non-significant indirect effect from self-control to adolescent-reported rule-breaking behavior through rules is not consistent with hypothesis two.

Antisocial peers. The path from self-control to antisocial peers was significant such that lower self-control was associated with more antisocial peer involvement (see Table 4). The path from antisocial peers to rule-breaking behavior was significant for adolescent-reported (see Table 5) rule-breaking behavior but not for parent-reported rule-breaking behavior (see Table 6). The indirect effect from self-control to rule-breaking behavior through antisocial peers was significant for adolescent-reported rule-breaking behavior but not for parent-reported rule-breaking behavior (see Table 7). Self-control remained a significant predictor of adolescent-reported rule-breaking behavior when antisocial peers was in the model. However, self-control was not a significant predictor of parent-reported rule-breaking behavior when antisocial peers was in the model. Results showing that lower self-control was associated with more involvement with antisocial peers are consistent with hypothesis two. Also, the significant indirect effect from self-control to adolescent-reported rule-breaking behavior through antisocial peers is consistent with hypothesis two.

In sum, the indirect effects from self-control to rule-breaking behavior through unsupervised time, parental solicitation and antisocial peers were significant for adolescent-reported, but not parent-reported, rule-breaking behavior. The indirect effect from self-control to rule-breaking behavior through rules was not significant in any analysis.

Hypothesis Three

Hypothesis three is that opportunities would moderate the association between self-control and rule-breaking behavior. This hypothesis was tested by computing interaction terms between self-control and each opportunity variable and regressing rule-breaking behavior on self-control, opportunity and the interaction, controlling for sex, race, SES and prior rule-breaking behavior.

Unsupervised time. The self-control × unsupervised time interaction was a significant predictor of adolescent-reported rule-breaking behavior (see Table 5) but the self-control × unsupervised time interaction was not a significant predictor of parent-reported rule-breaking behavior (see Table 6). As shown in Figure 3, simple slopes analyses indicated that lower self-control is more strongly associated with higher levels of adolescent-reported antisocial behavior at high levels of unsupervised time, b = -.28, SE = .05, p < .001, than at low levels of unsupervised time, b = -.13, SE.= 05, p < .001 (see Figure 3). The significant interaction showing that lower self-control is more strongly associated with rule-breaking behavior when unsupervised time is high is consistent with hypothesis three.

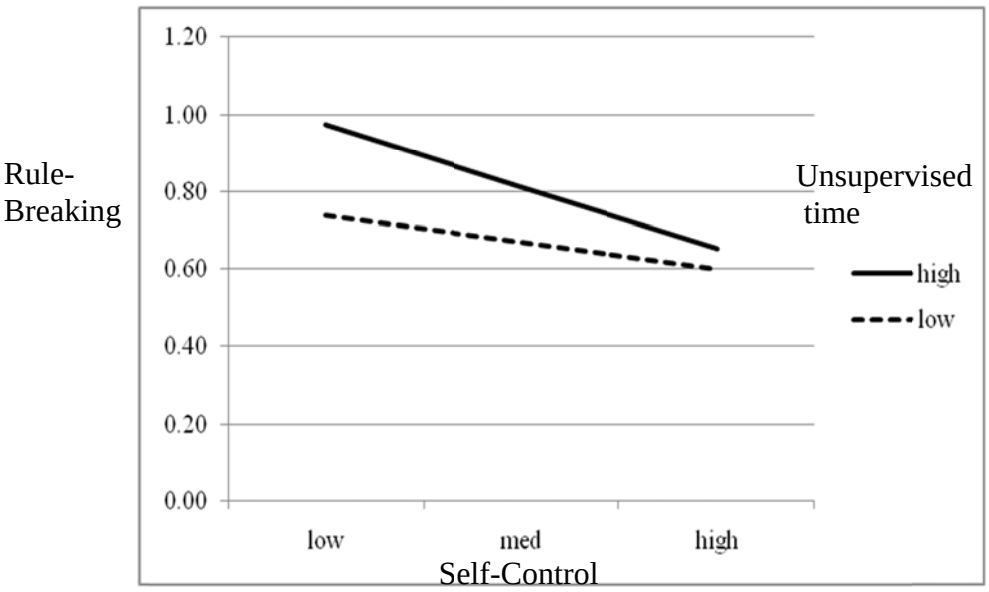

Figure 3. Fitted regression equation showing association between self-control and rule-breaking behavior at high and low levels of unsupervised time (Controlling for Sex, Race and SES).

Parental solicitation. The self-control × parental solicitation interaction was a significant predictor of adolescent-reported rule-breaking behavior (see Table 5) but was not a significant predictor of parent-reported rule-breaking behavior (see Table 6). Simple slopes indicated that lower self-control was more strongly associated with high levels of rule-breaking behavior at low levels of parental solicitation, b = -.27, SE = .04, p < .001, than at high levels of parental solicitation, b = -.13, SE = .04, p < .001 (see Figure 4). The significant interaction showing that lower self-control was more strongly associated with rule-breaking behavior when parental solicitation was low is consistent with hypothesis three.

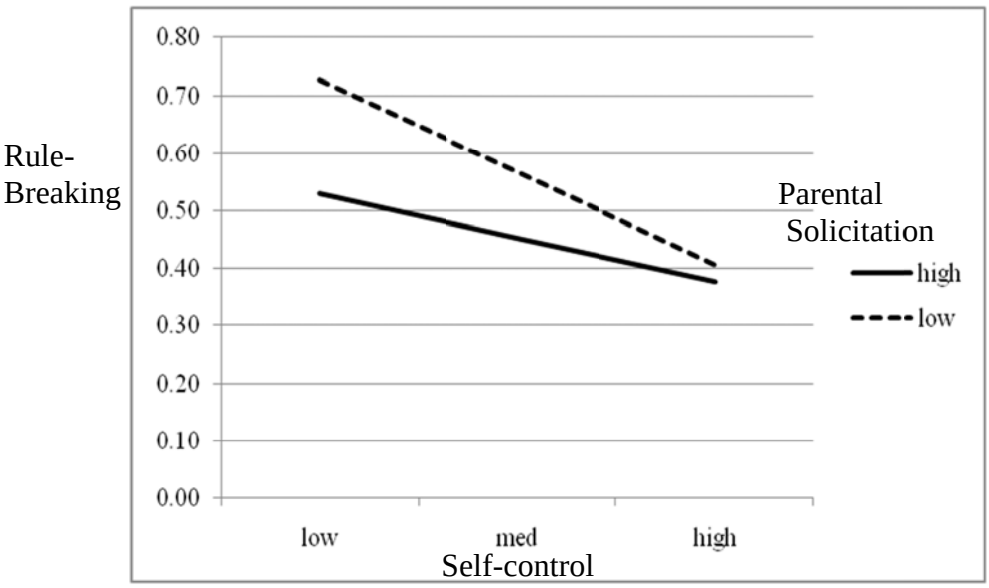

Figure 4. Fitted regression equation showing association between self-control and rule-breaking behavior at high and low levels of parental solicitation (controlling for Sex, Race and SES).

Rules. The self-control × rules interaction was not a significant predictor of any outcomes (see Tables 5 and 6). Thus, results are not consistent with hypothesis three.

Antisocial peers. The self-control × antisocial peers interaction was a significant predictor of adolescent-reported rule-breaking behavior **(**see Table 5) but not parent-reported rule-breaking behavior (see Table 6). Simple slopes indicated that lower self-control was more strongly associated with high levels of rule-breaking behavior at high levels of antisocial peers, *b* = -.29, *SE* = 04 *p* <.001, than at low levels of antisocial peers, *b* = -.06 *SE* = .04, p = .14 (see Figure 5). The significant interaction showing that lower self-control was more strongly associated with rule-breaking behavior when antisocial peers was high is consistent with hypothesis three.

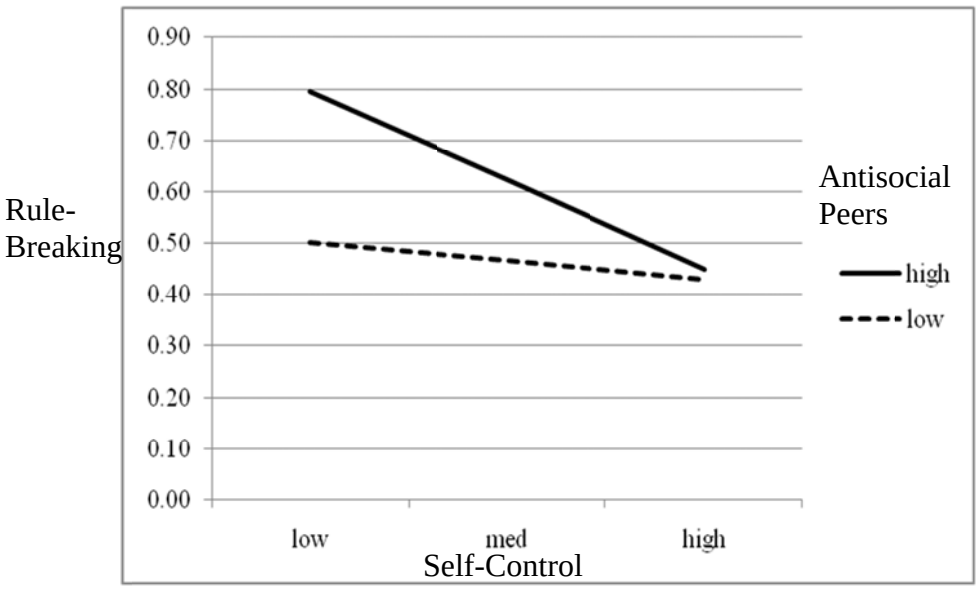

Figure 5. Fitted regression equation showing association between self-control and rule-breaking behavior at high and low levels of antisocial peers (controlling for Sex, Race and SES).

Simultaneous Analyses

When each opportunity variable was tested independently, results showed that unsupervised time, parental solicitation and antisocial peers predicted rule-breaking behavior. However, because the opportunity variables were correlated with one another, it may be that the same general effect was being assessed by all of the opportunity variables. If this is the case, what appears to be three different opportunity effects may be one effect manifested in three different ways. An analysis testing all the opportunities simultaneously was conducted to determine whether they were independently associated with rule-breaking behavior. Specifically, the first step of the regression included sex, race, SES, prior rule-breaking behavior, self-control and the opportunity variables and a set of four interactions were added on the second step. Table 8 presents results from simultaneous analyses.

In terms of hypothesis two, only the paths from unsupervised time and antisocial peer involvement to rule-breaking behavior were significant for adolescent-reported rule-breaking

behavior. Self-control remained a significant predictor of adolescent-reported rule-breaking behavior but self-control was not a significant predictor of parent-reported rule-breaking behavior. When the variables were tested simultaneously, only the paths from unsupervised time and antisocial peer involvement to rule-breaking behavior were significant for adolescent-reported rule-breaking behavior. In contrast, when the paths were tested independently the paths from unsupervised time, parental solicitation and antisocial peer involvement to rule-breaking behavior were significant for adolescent-reported rule-breaking behavior.

In terms of hypothesis three, only the self-control × antisocial peers interaction remained a significant predictor of adolescent-reported rule-breaking behavior. No interactions were significantly associated with parent-reported rule-breaking behavior. Simple slopes analyses indicated that lower self-control was more strongly associated with high levels of rule-breaking behavior at high levels of antisocial peers, b = -.27 SE =.04, $p < .001$, than at low levels of antisocial peers, b = -.04, SE = 04, p = .26 (see figure 6).

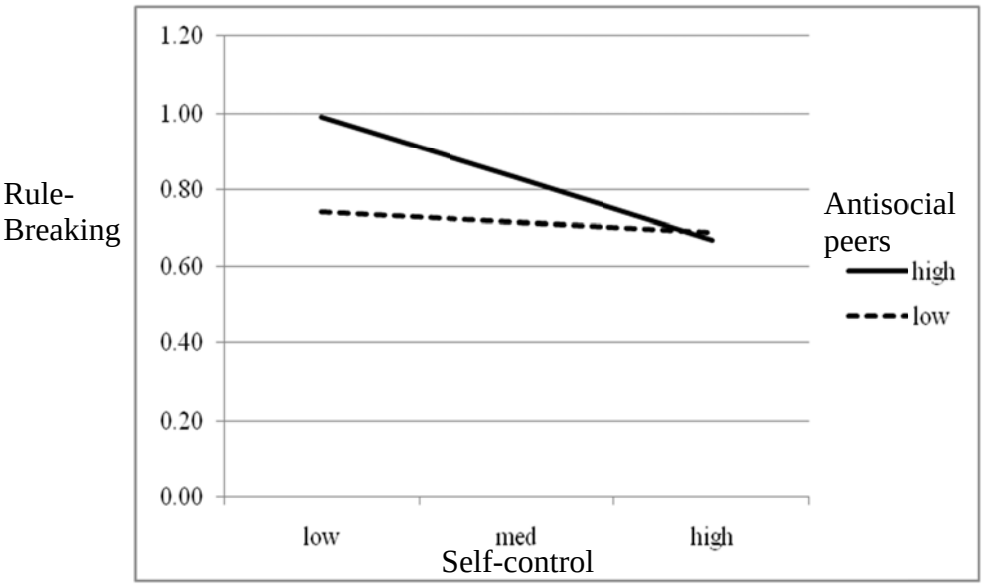

Figure 6. Fitted regression equation from simultaneous analyses showing association between self-control and rule-breaking behavior at high and low levels of antisocial peers (controlling for Sex, Race and SES).

Follow-up Analyses

Because findings were so different for parent- and adolescent-reported rule-breaking behavior, an additional set of exploratory analyses were conducted with adolescent reports of rule-breaking using only the sub-set of items in common with parent-reported rule-breaking. First, the association between self-control and rule-breaking behavior was tested controlling for sex, race and SES. Adolescent-reported rule-breaking was regressed on self-control, sex, race and SES. Lower self-control was associated with more adolescent-reported rule breaking, β = -.53, $p < .001$. Second, the associations between self-control and opportunities were tested controlling for sex, race and SES. In a series of four analyses, each opportunity variable was regressed on self-control, sex, race and SES to test these associations. Lower self-control was associated with more unsupervised time, β = -.36, $p < .001$, less parental solicitation, β = .22, $p < .01$, fewer rules, β = .20, $p < .01$, and more antisocial peers, β = -.39, $p < .001$. Third, the associations between the opportunity variables and rule-breaking behavior were tested controlling for sex, race and SES. In a series of four analyses, rule-breaking behavior was regressed on each of the opportunity variables, sex, race and SES. More unsupervised time, β = .45, $p < .001$, less parental solicitation, β = -.23, $p < .01$, fewer rules, β = -.23, $p < .001$, and more antisocial peers, β = .50, $p < .001$, were associated with more adolescent-reported rule breaking. Fourth, moderation was tested by computing interaction terms between self-control and each opportunity variable and regressing adolescent-reported rule breaking on self-control, opportunity and the interaction, controlling for sex, race and SES. The self-control × parental solicitation, β = .15, $p < .05$, and self-control × antisocial peers, β = -.14, $p < .05$, interactions were significant.

Discussion

The purpose of this study was to test three hypotheses drawn from Gottfredson and Hirschi's (1990) General Theory of Crime. Specifically, this study tested the main effect of self-control on rule-breaking behavior, tested self-selection as evidenced by an indirect effect from self-control to rule-breaking behavior through the restricted or enhanced opportunity variables, and tested restrictions or enhancements of opportunities as moderators of the link between self-control and rule-breaking behavior. This study found some support for all three of Gottfredson and Hirschi's (1990) hypotheses. Lower self-control was associated with more adolescent-reported rule-breaking behavior but was not associated with parent-reported rule-breaking. Youth with lower self-control had more unsupervised time, less parental solicitation and more antisocial peers than youth with higher levels of self-control, consistent with the self-selection hypothesis. Lower self-control was associated with rule-breaking behavior indirectly through unsupervised time, parental solicitation and involvement with antisocial peers. The spuriousness hypothesis was not supported in any analysis. Three interactions are consistent with the moderation hypothesis. In support of Gottfredson and Hirschi's (1990) moderation hypothesis, results indicated that parental solicitation, unsupervised time and antisocial peer involvement moderate the association between lower self-control and more rule-breaking behavior suggesting that the lower self-control is more strongly associated with rule-breaking behavior when opportunities are high. These results clarify and extend our understanding of the role of restricted or enhanced opportunities in the General Theory of Crime (Gottfredson & Hirschi, 1990).

Understanding Discrepant Findings for Parent and Adolescent Reports

It is important to note that this study found substantial discrepancy between parent reports and adolescent reports of rule-breaking behavior. While many results were significant for adolescent-reported rule-breaking behavior, no results were significant for parent-reported rule-

breaking behavior. In trying to understand these discrepancies, three possibilities are considered. First, because this study employed different measures of rule-breaking behavior for parents and adolescents, it is possible that the rule-breaking behavior measure used for parents may be less sensitive to variations in adolescents' opportunities than the rule-breaking items used for adolescents. However, analyses were conducted predicting adolescent-reported rule breaking behavior using the same items as parent-reported rule-breaking and findings were very similar to findings reported in the present study when predicting the original adolescent-reported rule-breaking scores, suggesting that the discrepancy is not due to the different items completed by parents and adolescents. Second, the discrepancy may be due to an informant bias wherein youth who perceive themselves as having lower self-control also perceive themselves as engaging in rule-breaking behavior or because youth who are willing to report that they have lower self-control are also willing to report that they engage in rule-breaking behavior. Third, some parents may have underreported adolescents' rule-breaking behavior because parents may only be aware of youths' rule-breaking behavior when youths are caught misbehaving. It is important to realize in the sections below that significant effects were limited to adolescent reports.

Association between Self-control and Rule-breaking Behavior

The initial goal of this study was to replicate the common finding that lower self-control is associated with more antisocial behavior (Jones & Quisenberry, 2004; Pratt & Cullen, 2000; Wood et al., 1993). As anticipated, early adolescents who reported lower self-control were significantly more likely to report more rule-breaking behavior controlling for sex, race, SES and prior rule-breaking behavior. Because lower self-control youth are more likely to engage in rule-breaking behavior, it may be particularly important for interventions to target adolescents with lower self-control. For example, to reduce the likelihood and level of youths' rule-breaking

behavior, both families and prevention/intervention programs can attempt to direct youths' lower self-control characteristics such as risk-seeking into activities that encourage youth to challenge themselves and achieve prosocial goals (Lynskey, Winfree, Esbensen, & Clason, 2000). Youth with preferences for physical activities should be encouraged to direct their energy into sports and the importance of mental activities should be stressed (Lynskey et al., 2000). Also, efforts can be made to channel lower self-control youths' impulsiveness into appropriate spontaneity (Lynskey et al., 2000).

Because this study did not test Gottfredson and Hirschi's (1990) hypothesis that self-control develops in early childhood and is stable throughout the life-course, the present study cannot confirm that this is the case. It is possible that Gottfredson and Hirschi's (1990) hypothesis is wrong and that self-control is not stable throughout the life course. If this is the case, the finding that lower self-control youth engage in more rule-breaking behavior suggests that designing and implementing interventions to increase youths' levels of self-control may help protect youth from engaging in antisocial behavior when opportunities arise. Interventions for improving youths' self-control do exist and a meta-analysis of 34 of these interventions for youth ages 10 and younger indicated that these programs do effectively improve youths' levels of self-control and reduce youths' problem behavior (Piquero, Jennings & Farrington, 2010). The present study contributes to prevention/intervention efforts by demonstrating the benefits of having higher levels of self-control and parental involvement.

Self-selection into Restricted or Enhanced Opportunities

Whereas many studies only tested the link between self-control and antisocial behavior, the current study tested restricted or enhanced opportunities in the context of parent and peer relationships as indirect effects and moderators of this link. Parents and peers facilitate or hinder

youths' opportunities by providing youth with unsupervised time, parental solicitation, rules and antisocial peers. These restrictions or enhancements of opportunities may be particularly important in early adolescence when there is a renegotiation of the parent-adolescent relationship and youth attempt to establish their own autonomy and spend more time with peers (Collins, 1995; Keijsers et al., 2010). Gottfredson and Hirschi (1990) proposed that individuals with lower self-control actively seek out environments and relationships conducive to crime due to their lower self-control and thus lower self-control causes both restrictions or enhancements of opportunities and crime and analogous acts, rendering opportunities not causally related to crime. However, Gottfredson and Hirschi's (1990) contention that the association between crime and analogous acts is spurious and due to lower self-control is not consistent with some evidence that more opportunities are associated with more antisocial behavior (e.g., Beck et al., 2006; Cohen et al., 2002; Dishion, Andrews et al., 1995; Osgood et al., 1996). Thus, a goal of the present study was to test Gottfredson and Hirschi's (1990) self-selection, indirect effect and spuriousness hypotheses.

In their self-selection hypothesis, Gottfredson and Hirschi (1990) proposed that individuals with lower self-control seek out more opportunities for antisocial behavior due to their lower self-control. The indirect hypothesis is that lower self-control leads to antisocial behavior indirectly through lower self-control individual's propensities to seek out more opportunities. The spuriousness hypothesis is that the link between opportunities and antisocial behavior is spurious and due to lower self-control. The present study's results indicate partial support for the self-selection hypothesis. Specifically, results indicated that lower self-control youth do experience more unsupervised time, less parental solicitation and are more involved with antisocial peers consistent with the self-selection hypothesis. However, lower self-control

youth's parents do not implement significantly fewer rules for their children, inconsistent with the self-selection hypothesis. Results also indicated significant indirect effects from self-control to adolescent-reported rule-breaking behavior through unsupervised time, parental solicitation and antisocial peers. However, there was not an indirect effect from self-control to rule-breaking behavior through rules and there were no significant indirect effects for parent-reported rule-breaking behavior. The present study's results are not consistent with Gottfredson and Hirschi's (1990) hypothesis that the link between opportunities and antisocial behavior is spurious and due to lower self-control because when controlling for self-control, more unsupervised time, less parental solicitation, fewer rules and more involvement with antisocial peers were significantly associated with adolescent-reported rule-breaking behavior. Significant findings provide evidence that individuals with lower self-control are more likely to create or be exposed to opportunities for rule-breaking behavior than individuals with higher self-control, consistent with the claim that self-control is an important adaptive quality (Gottfredson & Hirschi, 1990). The lack of support found for the spuriousness hypothesis indicates that the self-selection hypothesis and the hypothesis that opportunities are causally related to antisocial behavior are not mutually exclusive, consistent with Evans et al.'s (1997) conclusion, because the current study found evidence for self-selection as well as additive and moderating effects of restricted or enhanced opportunities.

Restricted or Enhanced Opportunities as Moderators of the Association between Self-control and Rule-breaking

Another goal of this study was to test Gottfredson and Hirschi's (1990) hypothesis that opportunities moderate the effect of lower self-control on antisocial behavior such that lower self-control is more strongly associated with antisocial behavior when youth have more, rather

than fewer, opportunities. Results indicated that lower self-control is more strongly associated with adolescent-reported rule-breaking behavior when youth had more unsupervised time, less parental solicitation and more involvement with antisocial peers but rules did not moderate the association between lower self-control and rule-breaking behavior and there were no moderation effects for parent-reported rule-breaking behavior. Results suggest that lower self-control youth with more unsupervised time, less parental solicitation and more antisocial peers are at increased risk for rule-breaking behavior compared with higher self-control youth and lower self-control youth with more restricted opportunities. Inconsistent with Gottfredson and Hirschi's (1990) hypothesis that opportunities are ubiquitous and lower self-control individuals will seek out more opportunities, lower self-control youth with restricted opportunities engaged in lower rates of rule-breaking behavior. These findings suggest that restricting youths' opportunities by providing youth with supervision, monitoring youths' whereabouts and activities, and regulating with whom youth can and cannot be friends may be an effective method for preventing or intervening with lower self-control youth engaging in, or at-risk for engaging in, rule-breaking behavior.

The significant moderation effects for unsupervised time and parental solicitation are consistent with prior research indicating that lower self-control is more strongly associated with delinquent offenses among youth with more unsupervised time and poorly informed parents (LaGrange & Silverman, 1999). The significant moderation effect for antisocial peers is consistent with prior research indicating that antisocial peer involvement significantly predicts antisocial behavior among youth with low or average levels of self-control but not among youth with higher self-control (Gardner et al., 2008). In contrast to LaGrange and Silverman (1999) whose results indicated that lower self-control adolescents who experienced fewer rules had

more delinquent offenses, the current study found that rules did not moderate the association between self-control and rule-breaking behavior. This discrepancy could be due to different populations used in each study (LaGrange and Silverman (1999) employed high and junior high school students whereas the current study employed middle school students), different questions regarding rules (the LaGrange and Silverman (1999) study asked about rules regarding curfew) or different outcome measures (the LaGrange and Silverman (1999) study studied delinquent offenses whereas the current study's outcome measure is rule-breaking behavior).

When restricted or enhanced opportunities were examined independently, three of the four indicators of restricted or enhanced opportunities (unsupervised time, parental solicitation and antisocial peers) were found to moderate the association between self-control and rule-breaking behavior. However, when all opportunities were assessed simultaneously, only two opportunities (unsupervised time and antisocial peers) moderated the association between self-control and rule-breaking behavior. Because opportunities were correlated with each other, it might be that unsupervised time and antisocial peers matter most or are most powerful.

Strengths and Limitations

A methodological strength of the current study is that it used analogous behaviors as an outcome of self-control rather than using analogous behaviors as a proxy for self-control. A limitation of previous research is that some studies blur the distinction between self-control and analogous behaviors. While Gottfredson and Hirschi (1990) assert that the best measure of the propensity to offend is a count of the problem behaviors that individuals engage in, using analogous behaviors as a proxy for self-control is tautological in that results indicate that one form of antisocial behavior predicts another form of antisocial behavior. Instead, the current study's method is beneficial because results yielded from the analyses indicate that self-control

predicts analogous behaviors. A second strength of this study is that it controlled for prior rule-breaking behavior. Controlling for prior rule-breaking behavior is beneficial because rule-breaking behavior may be quite stable. Controlling for earlier rule-breaking behavior provides a test of whether self-control and restricted or enhanced opportunities explain change in rule-breaking behavior from the previous year. A third strength of this study is that it utilized both parent and adolescent reports. This allowed the current study to assess whether results generalize across multiple informants' reports of rule-breaking behavior.

However, this study is not without limitations. For example, Gottfredson and Hirschi (1990) view self-control as the individual level cause of crime and analogous act but more recent conceptualizations of self-control view self-control as only one factor along with others that affect crime and analogous behaviors (Desmond, Ulmer & Bader, 2007). Indeed, Hirschi and Gottfredson (1993) clarified that their theory does not suggest that self-control is the only cause of crime (Muraven, Pogarsky & Shmueli, 2006). Research has increasingly focused on other theoretical constructs in addition to self-control (Muraven et al., 2006). For example, Baron (2003) found that long-term homelessness, deviant peers, deviant values and unemployment all predicted crime, controlling for levels of self-control (Muraven et al., 2006). Also, according to Gottfredson and Hirschi (1990), self-control develops in early childhood. The primary influences on self-control are parenting and parent-child relationships (Gottfredson & Hirschi, 1990). The current study conceptualizes aspects of parenting as restricted or enhanced opportunities but these parenting practices are likely related to parenting children received earlier in life. Thus, it was particularly important for the current study to control for restricted or enhanced opportunities. When controlling for unsupervised time, parental solicitation, rules and antisocial peers separately and simultaneously, self-control continued to predict adolescent-reported rule-

breaking behavior but not parent-reported rule-breaking behavior. This indicates that even when controlling for the relation between parenting practices as sources of self-control and as restricted or enhanced opportunities, lower self-control individuals were more likely to engage in rule-breaking behavior, according to adolescent report. A second limitation of this study is that it employed different measures of rule-breaking behavior for parents and adolescents. The parent measure of rule-breaking behavior assessed adolescent rule breaking behavior only whereas the adolescent measure assessed rule-breaking behavior and delinquency, alcohol, tobacco and drug use. A third limitation of this study is that adolescents reported their perceptions of their peers' antisocial behavior. This is a limitation because research indicates that adolescents' perceptions of their friends' antisocial behavior is correlated more strongly with adolescents' own concurrent behavior (Laird, Pettit, Dodge, & Bates, 1999). However, there is no evidence that the interaction between adolescents' reports of their friends' behavior and adolescents' reports of their own behavior is different than the interaction between adolescents' friends' reports of adolescents' behavior and adolescents' reports of friends' behavior so because the present study examines the interaction between adolescents' reports of their own behavior and adolescents' reports of their friends' behavior, the primary critique of using adolescents reports of antisocial behavior may not be a limitation. A fourth limitation of this study is that the sample was selected from a single geographic region. While the sample includes both sexes, is ethnically diverse and the demographic characteristics reflect the geographic area from which the sample was recruited, well-educated parents and two-parent families are over-represented and the convenience sample may be biased by the desire to collect data through interviews in participants' homes.

Summary. Despite these limitations, the present study's findings provide considerable support for the General Theory of Crime (Gottfredson & Hirschi, 1990) as well as suggest that

some of the General Theory of Crime's claims may be inaccurate. The current study assessed the main effect of self-control on rule-breaking behavior, self-selection as evidenced by an indirect effect from self-control to rule-breaking behavior through the opportunity variables and tested restricted or enhanced opportunities as moderators of the link between self-control and rule-breaking behavior. Findings support the conclusions that lower self-control youth engage in more rule-breaking behavior and, in support of the self-selection hypothesis, experience more opportunities for rule-breaking behavior, which in turn lead to higher rates of rule-breaking behavior for these youth. Importantly however, restricted or enhanced opportunities are unique predictors of rule-breaking behavior even when controlling for self-control, despite Gottfredson and Hirschi's (1990) claim that the relationship between restricted or enhanced opportunities and antisocial behavior is spurious and due to lower self-control. This finding suggests that Gottfredson and Hirschi's (1990) self-selection hypothesis need not be viewed as mutually exclusive with the hypothesis that opportunities are causally related to rule-breaking behavior. Finally, evidence of moderation indicates that lower self-control youth with more opportunities exhibit higher rates of rule-breaking behavior. Evidence of the direct, indirect and interactive relationship among lower self-control, restricted or enhanced opportunities and rule-breaking behavior indicates that intervention/prevention and parenting efforts should focus on multiple components – lower self-control propensity, parental supervision and monitoring and peer relationships – for successful prevention of or intervention in youths' rule-breaking behavior. The importance of the interrelationship between lower self-control, parenting and rule-breaking behavior for both theory and prevention/intervention programs warrants attention, and research in this area would provide more informed strategies to prevent/intervene with rule-breaking behavior.

References

Arneklev, B. J., Grasmick, H. G., Tittle, C. R., & Bursik, R. J., Jr. (1993). Low self-control and imprudent behavior. *Journal of Quantitative Criminology, 9,* 225- 247.

Baumeister, R.F., Heatherton, T.F., & Tice, D.M. (1994). *Losing control: how and why people fail at self-regulation.* San Diego, CA: Academic Press.

Baron, S.W. (2003). Self-control, social consequences and criminal behavior: street youth and the general theory of crime. *Journal of Research in Crime and Delinquency, 40,* 403–425.

Baron, R.M., & 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,* 1173–1182.

Beck, K. H., Hartos, J. L., & Simons-Morton, B. G. (2006). Relation of parent-teen agreement on restrictions to teen risky driving over 9 months. *American Journal of Health Behavior, 30,* 533-545.

Bosworth, K., & Espelage, D. (1995). *Teen conflict survey*. Unpublished manuscript, Center for Adolescent Studies, Indiana University.

Carver, C. S., & Scheier, M. F. (1998). *On the self-regulation of behavior*. New York: Cambridge University Press.

Cohen, D. A., Farley, T. A., Taylor, S. N., Martin, D. H., & Schuster, M. A. (2002). When and where do youths have sex? The potential role of adult supervision. *Pediatrics, 110,* e66-e71.

Cohen, J., Cohen, P., West, S.G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences.* (3rd ed). Mahwah, New Jersey: Lawrence Erlbaum Associates.

Crouter, A. C., & Head, M. R. (2002). Parental monitoring and knowledge of children. In M. Bornstein (Ed.), *Handbook on parenting* (2nd ed.). Mahwah, NJ: Lawrence Erlbaum.

DeLisi, M. (2001a). Designed to fail: self-control and involvement in the criminal justice system. *American Journal of Criminal Justice, 26,* 131-148.

Desmond, S.A., Ulmer, J.T., & Bader, C.D. (2007). Religion, prosocial learning, self-control and delinquency. Paper presented at the annual meeting of the American Society of Criminology, Atlanta, Georgia.

Dishion, T. J., Andrews, D. W., Kavanagh, K., & Soberman, L. H. (1996). Preventive interventions for high-risk youth: The Adolescent Transitions Program. In R. D. Peters & R. J. McMahon (Eds.), *Preventing childhood disorders, substance abuse, and delinquency* (pp. 184–214). Thousand Oaks, CA: Sage.

Dishion, T. J., Capaldi, D., Spracklen, K. M., & Li, F. (1995). Peer ecology of male adolescent drug use. *Development and Psychopathology, 7,* 803-824.

Dishion, T. J., Eddy, J. M., Haas, E., Li, F., & Spracklen, K. (1997). Friendships and violent behavior during adolescence. *Social Development, 6,* 207-223.

Dishion, T. J., & McMahon, R. J. (1998). Parental monitoring and the prevention of child and adolescent problem behavior: A conceptual and empirical formulation. *Clinical Child and Family Psychology Review, 1,* 61–75.

Dishion, T. J., Nelson, S. E., Winter, C. E., & Bullock, B. M. (2004). Adolescent friendship as a dynamic system: Entropy and deviance in the etiology and course of male antisocial behavior. *Journal of Abnormal Child Psychology, 32,* 651–663.

Dishion, T. J., Spracklen, K. M., Andrews, D. W., & Patterson, G. R. (1996). Deviancy training in male adolescent friendships. *Behavior Therapy, 27,* 373–390.

Dishion, T. J., Patterson, G. R., Stoolmiller, M., & Skinner, M. L. (1991). Family, school, and behavioral antecedents to early adolescent involvement with antisocial peers. *Developmental Psychology, 27*, 172-180.

Dishion, T. J., & Stormshak, E. (2007). *Intervening in children's lives: An ecological, family-centered approach to mental health care*. Washington, DC: American Psychological Association.

Duncan, G.J., Brooks-Gunn, J., & Klebanov, P.K.(1994). Economic deprivation and early childhood development. *Child Development, 65,* 296 – 318.

Evans, T. D, Cullen, F. T., Burton, V. S., Dunaway, R. G., & Benson, M. L. (1997). The social consequences of self-control: Testing the general theory of crime. *Criminology, 35,* 475-501.

Farrell, A. D., Kung, E. M., White, K. S., & Valois, R. F. (2000). The structure of self-reported aggression, drug use, and delinquent behaviors during early adolescence. *Journal of Clinical Child Psychology, 29,* 282–292.

Finkenauer, C., Engels, R. C. M. E., & Baumeister, R. F. (2005). Parenting and adolescent externalizing and internalizing problems: The role of self-control. *International Journal of Behavioral Development, 29,* 58-69.

Gardner, T., Dishion, T., & Connell, A. (2008). Adolescent self-regulation as resilience: Resistance to antisocial behavior within the deviant peer context. *Journal of Abnormal Child Psychology, 36,* 273-284.

Gonzales, N.A., Cauce, A.M., Friedman, R.J., & Mason, C.A. (1996). Family, peer, and neighborhood influences on academic achievement among African-American adolescents: One-year prospective effects. *American Journal of Community Psychology, 24,* 365 – 387.

Gottfredson, M. R., & Hirschi, T. (1990). A General Theory of Crime. Stanford, California: Stanford University Press.

Granic, I., & Dishion, T. J. (2003). Deviant talk in adolescent friendships: A step toward measuring a pathogenic attractor process. *Social Development, 12,* 314–334.

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

Grusec, J.E. & Goodnow, J.J. (1994). Impact of parental discipline methods on the child's internalization of values: A reconceptualization of current points of view. *Developmental Psychology, 30,* 4-19.

Guilamo-Ramos, V., Jaccard, J., Dittus, P., & Bouris, A. M. (2006). Parental expertise, trustworthiness, and accessibility: Parent-adolescent communication and adolescent risk behavior. *Journal of Marriage and Family, 68,* 1229-1246.

Hiatt, K. D., & Dishion, T. J. (2007). Antisocial personality development. In T. P. Beauchaine & S. P. Hinshaw (Eds.), *Child and adolescent psychopathology* (pp. 370–404). New York: Wiley Press.

Hirschi, T. H. & Gottfredson, M. (1993). Commentary: testing the general theory of crime. *Journal of Research in Crime and Delinquency, 30,* 47 – 54.

Jones, S., Cauffman, E., & Piquero, A. (2007). The influence of parental support among incarcerated adolescent offenders: The conditioning effects of impulse control and empathy. *Criminal Justice & Behavior, 34,* 229-245.

Jones, S. & Quisenberry, N. (2004). The general theory of crime: how general is it? *Deviant Behavior, 25,* 401 -426

Keane, C., Maxim, P. S., & Teevan, J. J. (1993). Drinking and driving, self-control, and gender: Testing a general theory of crime. *Journal of Research in Crime and Delinquency, 30,* 30-46.

Keijsers, L., Branje, S. J. T., VanderValk, I. E., & Meeus, W. (2010). Reciprocal effects between parental solicitation, parental control, adolescent disclosure, and adolescent delinquency. *Journal of Research on Adolescence, 20,* 88 – 113.

LaGrange, T., & Silverman, R. (1999). Low self-control and opportunity: Testing the general theory of crime as an explanation for gender differences in delinquency. *Criminology, 37,* 41-72.

Laird, R. D., Criss, M.M., Pettit, G.S., Bates, J. E., & Dodge, K. A. (2009). Developmental trajectories and antecedents of distal parental supervision. *The Journal of Early Adolescence, 29,* 258-284.

Laird, R.D., Marrero, M.D. (2010). Information management and behavior problems: Is concealing misbehavior necessarily a sign of trouble? *Journal of Adolescence, 33,* 297-308. doi:10.1016/j.adolescence.2009.05.018

Laird, R.D., Marrero, M.D., & Sentse, M. (2010). Revisiting parental monitoring: Evidence that parental solicitation can be effective when needed most. *Journal of Youth and Adolescence, 39,* 1431- 1441. Doi: 10.1007/s10964-009-9453-5

Laird, R.D., Pettit, G.S., Bates, J.E., & Dodge, K.A. (2003). Parents' monitoring-relevant knowledge and adolescents' delinquent behavior: Evidence of correlated developmental changes and reciprocal influences. *Child Development, 74,* 752 – 768.

Lynskey, D.P., Winfree, L.T., Esbensen, F., & Clason, D.L. (2000). Linking gender, minority group status and family matters to self-Control theory: A multivariate analysis of key self-control concepts in a youth-gang context. *Juvenile and Family Court Journal, 51,* 1 – 19.

McCartney, K., Burchinal, M. R., & Bub, K. L. (2006). Best practices in quantitative methods for developmentalists. *Monographs of the Society for Research in Child Development, 71*(3, Serial No. 285).

Moffit, T.E., & Caspi, A. (2001). Childhood predictors differentiate life-course persistent and adolescence-limited antisocial pathways among males and females. *Development and Psychopathology, 13,* 355 – 375.

Mott, J. A., Crowe, P. A., Richardson, J., & Flay, B. (1999). After-school supervision and adolescent cigarette smoking: Contributions of settings and intensity of after-school self-care. *Journal of Behavioral Medicine, 22,* 35–58.

Muraven, M., & Baumeister, R. F. (2000). Self-regulation and depletion of limited resources: Does self-control resemble a muscle? *Psychological Bulletin, 126,* 247–259.

Muraven, M., Pogarsky, G., & Shmueli, D. (2006). Self-control depletion and the general theory of crime. *Journal of Quantitative Criminology, 22,* 263 – 277.

Nelson, S. E., & Dishion, T. J. (2004). From boys to men: Predicting adult adaptation from middle childhood sociometric status. *Development and Psychopathology, 16,* 441–459.

Osgood, D. W., and Anderson, A. L. (2004). Unstructured socializing and rates of delinquency. *Criminology 42,* 519-549.

Osgood, D. W., Wilson, J. K., Bachman, J.G., O'Malley, P. M., & Johnston, L.D. (1996). Routine activities and individual deviant behavior. *American Sociological Review 61,* 635-655.

Paternoster, R., & Brame, R. (1998). The structural similarity of processes generating criminal and analogous behaviors. *Criminology, 36,* 633-670.

Patterson, G.R., & Dishion, T.J. (1985). Contributions of families and peers to delinquency. *Criminology 23,* 63-79.

Patterson, G. R., Dishion, T. J., & Yoerger, K. (2000). Adolescent growth in new forms of problem behavior: Macro- and micro-peer dynamics. *Prevention Science, 1,* 3–13.

Piehler, T. F., & Dishion, T. J. (2007). Interpersonal dynamics within adolescent friendship: Dyadic mutuality, deviant talk, and patterns of antisocial behavior. *Child Development, 78,* 1611–1624.

Pettit, G. S., Laird, R. D., Dodge, K. A., Bates, J. E., & Criss, M. M. (2001). Antecedents and behavior-problem outcomes of parental monitoring and psychological control in early adolescence. *Child Development, 72,* 583-598.

Piquero, A. R., Jennings, W.G., & Farrington, D.P. (2010). Self-control interventions for children under age 10 for improving self-control and delinquency and problem behaviors. *Campbell Systematic Reviews, 2.* DOI: 10.4073/csr.2010.2

Polakowski, M. (1994). Linking self- and social control with deviance: Illuminating the structure underlying a general theory of crime and its relation to deviant activity. *Journal of Quantitative Criminology, 10,* 41-78.

Poulin, F., Dishion, T. J., & Haas, E. (1999). The peer influence paradox: Relationship quality and deviancy training within male adolescent friendships. *Merrill–Palmer Quarterly, 45,* 42-61.

Pratt, T. C., & Cullen, F. T. (2000). The empirical status of Gottfredson and Hirschi's general theory of crime: A meta-analysis. *Criminology, 38,* 931-964.

Sourander, A., Elonheimo, H., Niemla, S., Nuutila, A., Helenius, H., Sillanmaki, L., Piha, J., Tamminen, T., Kumpulanien, K., Moilanen, I., & Almqvist, F. (2006). Childhood predictors of male criminality: A propsective population-based-follow-up study from age 8 to late adolescence. *Journal of the American Academy of Child and Adolescent Psychiatry, 45,* 578 – 586.

Stattin, H., & Kerr, M. (2000). Parent monitoring: A reinterpretation. *Child Development, 71,* 1072–1085.

Streiner, D. L. (2003). Being inconsistent about consistency: When coefficient alpha does and doesn't matter. *Journal of Personality Assessment, 80,* 217-222.

Tangney, J.P., Baumeister, R.F., Boone, A.L.(2004). High self-control predicts good adjustment, less pathology, better grades, and interpersonal success. *Journal of Personality, 72,* 271-322.

Thornberry, T.P. & Krohn, M.D. (1997). Peers, drug use, and delinquency. In D. M. Stoff, J. Breiling, & J. D. Maser, *Handbook of Antisocial Behavior* (p. 218 – 33). New York: Wiley.

Vazsonyi, A.T., & Chen, P. (2010). Entry risk into the juvenile justice system: African American, American Indian, Asian American, European American, and Hispanic children and adolescents. *Journal of Child Psychology and Psychiatry, 51,* 668 – 678.

Weaver, S. R., & Prelow, H. M. (2005). A mediated-moderation model of maternal parenting style, association with deviant peers, and problem behaviors in urban African American and European American adolescents. *Journal of Child and Family Studies, 14,* 343 – 356.

Wight, D., Williamson, L., Henderson, M. (2006). Parental influences on young people's sexual behaviour: a longitudinal analysis. *Journal of Adolescence, 29,*473-494.

Wills, T. A., & Dishion, T. J. (2004). Temperament and adolescent substance use: A transactional analysis of emerging self-control. In P. Frick & W. Silverman (Eds.), Temperament and childhood psychopathology [Special Issue]. *Journal of Clinical Child and Adolescent Psychology, 33,* 69-81.

Wood, P., Pfefferbaum, B., & Arneklev, B. (1993). Risk-taking and self-control: Social psychological correlates of delinquency. *Journal of Crime and Justice, 16,* 395-418.

Wright, B.R.E., Caspi, A., Moffitt, T.E. & Silva, P.A. (1999). Low self-control, social bonds, and crime: Social causation, social selection, or both? *Criminology, 37,* 479-514.

Youngstrom, E., Loeber, R., & Stouthamer-Loeber, M. (2000). Patterns and correlates of agreement between parent, teacher, and male adolescent ratings of externalizing and internalizing problems. *Journal of Consulting and Clinical Psychology, 68,* 1038-1050.

Zimring, F.E. 1998. *American Youth Violence.* New York, NY: Oxford University Press.

Table 1. *Descriptive Statistics.*

	α	*M*	*SD*	*Range*	*Skewness*	*Kurtosis*
Self-control	.88	2.79	.59	1 – 4.46	-.17	.34
Unsupervised Time	.65	2.75	.73	1.17 – 4.83	.24	-.36
Parental Solicitation	.79	3.31	.83	1 - 5	-.13	-.34
Rules	.58	2.6	1.42	0 - 5	.02	-.87
Antisocial Peers	.75	2.34	.49	1.38 – 3.75	.15	-.41
Prior AR Rule-breaking Behavior	.83	1.39	.33	1 – 2.89	1.47	2.70
AR Rule-breaking Behavior	.87	1.44	.40	1 – 3.17	1.73	3.75
Prior PR Rule-breaking Behavior	.81	1.77	.58	1 – 3.67	1.16	1.1
PR Rule-breaking Behavior	.78	1.81	.61	1 – 4.17	1.20	1.54

AR = adolescent-reported; PR = parent-reported

Table 2. *Bivariate Correlations.*

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Self-control													
2. Unsupervised Time	-.34***												
3. Parental Solicitation	.25***	-.26***											
4. Rules	.20**	-.25***	.40***										
5. Antisocial Peers	-.45***	.38***	-.17*	-.13									
6. Prior AR Rule-breaking Behavior	-.35***	.38***	-.10	-.12	.41***								
7. AR Rule-breaking Behavior	-.56***	.46***	-.30***	-.25***	.53***	.69***							
8. Prior Parent-Reported Rule-breaking Behavior	-.15***	.11	.02	.00	.21**	.33***	.28***						
9. Parent-Reported Rule-breaking Behavior	-.23**	.15*	-.09	-.09	.25***	.23**	.34***	.74***					
10. SES	.21**	-.03	.12	.04	-.17*	-.07	-.24***	-.05	-.09				
11. Sex	-.20**	-.00	-.09	-.04	.31***	.16*	.16*	.19**	.15*	-.03			
12. Black	-.06	.02	-.05	-.08	.04	.12	.16*	-.18**	.04	-.18**	.04		
13. White	.03	-.02	.01	.11	.02	-.08	-.08	-.02	.02	.18**	.01	-.89***	

Note: * $p < .05$, ** $p \leq .01$, *** $p < .001$

Table 3. *Association between Self-control and Rule-breaking Behavior Controlling for Prior Rule-breaking Behavior, Sex, Race and SES.*

	Adolescent-Reported Rule-breaking Behavior			Parent-Reported Rule-breaking Behavior		
	b(SE)	*b**	*p*	*b(SE)*	*b**	*p*
Prior Rule-breaking Behavior	.69(.07)	.55	.00	.79(.06)	.74	.00
Sex	.03(.04)	.04	.47	.02(.07)	.01	.83
White	.14(.08)	.18	.09	-.01(.14)	-.01	.96
Black	.15(.08)	.20	.06	-.07(.14)	-.06	.60
SES	-.02(.02)	-.05	.35	-.02(.03)	-.03	.55
Self-control	-.23(.04)	-.34	.00	-.09(.06)	-.09	.12

Table 4. *Self-control Predicting Opportunities Controlling for Prior Rule-breaking Behavior, Sex, Race and SES.*

	Unsupervised Time			Parental Solicitation			Rules			Antisocial Peers		
	b(SE)	*b**	*p*	*b(SE)*	*b**	*p*	*b(SE)*	*b**	*p*	*b(SE)*	*b**	*p*
Control Variables												
Prior Rule-breaking	.76(.19)	.31	.00	-.06(.22)	-.02	.80	-.26(.38)	-.06	.50	.40(.11)	.25	.00
Behavior												
SES	.06(.05)	.09	.22	.01(.06)	.01	.93	-.08(.11)	-.06	.49	-.06(.03)	-.13	.05
Sex	-.10(.11)	-.07	.34	-.07(.13)	-.04	-.59	-.03(.23)	-.01	.88	.22(.07)	.22	.00
Black	-.06(.22)	-.04	.80	-.26(.26)	-.16	.34	.28(.46)	.10	.54	.13(.14)	.12	.35
White	-.07(.22)	-.05	.75	-.19(.26)	-.12	.48	.61(.46)	.22	.18	.19(.13)	.19	.16
Self-control	-.30(.10)	-.25	.00	.26(.12)	.19	.03	.38(.21)	.16	.07	-.27(.06)	-.32	.00

Table 5. *Predicting Adolescent-Reported Rule-breaking Behavior Controlling for Prior Rule-breaking Behavior, Sex, Race and SES.*

	Unsupervised Time			Parental Solicitation			Rules			Antisocial Peers		
	b(SE)	*b**	*p*	*b(SE)*	*b**	*p*	*b(SE)*	*b**	*p*	*b(SE)*	*b**	*p*
Step 1												
Prior Rule-breaking Behavior	.82(.07)	.66	.00	.82(.07)	.66	.00	.87(.07)	.69	.00	.87(.07)	.69	.00
SES	.77(.08)	.62	.00	-.04(.02)	-.10	.10	-.04(.02)	-.10	.10	-.04(.02)	-.10	.10
Sex	.07(.04)	.10	.11	.08(.04)	.10	.09	.08(.04)	.10	.09	.08(.04)	.10	.09
Black	.16(.09)	.21	.08	.16(.09)	.20	.09	.16(.09)	.20	.09	.16(.09)	.20	.09
White	.16(.09)	.21	.08	.15(.09)	.19	.10	.15(.09)	.19	.10	.15(.09)	.19	.10
Step 2												
Self-control	-.21(.04)	-.33	.00	-.21(.04)	-.32	.00	-.22(.04)	-.33	.00	-.19(.04)	-.28	.00
Unsupervised Time	.09(.03)	.18	.00									
Parental Solicitation				-.07(.02)	-.14	.01						
Rules							-.04(.01)	-.13	.01			
Antisocial Peers										.16(.05)	.20	.00
Step 3												
Self-control × Unsupervised Time	-.11(.04)	-.14	.01									
Self-control × Parental Solicitation				.09(.03)	.13	.01						
Self-control × Rules							.03(.02)	.08	.13			
Self-control × Antisocial Peers										-.23(.06)	-.19	.00

Table 6. *Predicting Parent-Reported Rule-breaking Behavior Controlling for Prior Rule-breaking Behavior, Sex, Race and SES.*

	Unsupervised Time			Parental Solicitation			Rules			Antisocial Peers		
	b(SE)	*b**	*p*	*b(SE)*	*b**	*p*	*b(SE)*	*b**	*p*	*b(SE)*	*b**	*p*
Step 1												
Prior Rule-breaking Behavior	.80(.06)	.76	.00	.80(.06)	.75	.00	.80(.06)	.75	.00	.80(.06)	.75	.00
SES	-.02(.03)	-.04	.51	-.03(.03)	-.04	.41	-.03(.03)	-.04	.41	-.03(.03)	-.04	.41
Sex	.04(.07)	.04	.51	.04(.07)	.03	.58	.04(.07)	.03	.58	.04(.07)	.03	.58
Black	-.06(.14)	-.05	.66	-.07(.14)	-.05	.63	-.07(.14)	-.05	.63	-.07(.14)	-.05	.63
White	-.01(.14)	-.00	.97	-.00(.14)	-.00	.98	-.00(.14)	-.00	.99	-.00(.14)	-.00	.98
Step 2												
Self-control	-.08(.06)	-.08	.18	-.08(.06)	-.08	.17	-.08(.06)	-.08	.16	-.06(.06)	-.05	.38
Unsupervised Time	.03(.05)	.03	.60									
Parental Solicitation				-.03(.04)	-.04	.41						
Rules							-.02(.02)	-.05	.37			
Antisocial Peers										.10(.08)	.08	.19
Step 3												
Self-control × Unsupervised Time	.01(.07)	.01	.84									
Self-control × Parental Solicitation				-.03(.06)	-.03	.64						
Self-control × Rules							.01(.04)	.01	.86			
Self-control × Antisocial Peers										.04(.10)	.02	.73

Table 7. *Indirect Effects from Self-control to Rule-breaking Behavior through Opportunities.*

Predictor	Through	Dependent Variable	Indirect Effect *M*	*SE*	95% Confidence Interval Lower	Upper
Self-control	Unsupervised Time	AR Rule-breaking Behavior	-.06	.02	-.1113	-.0261
Self-control	Parental Solicitation	AR Rule-breaking Behavior	-.03	.02	-.0658	-.0041
Self-control	Rules	AR Rule-breaking Behavior	-.02	.01	-.0432	.0012
Self-control	Antisocial Peers	AR Rule-breaking Behavior	-.10	.03	-.1604	-.0543
Self-control	Unsupervised Time	PR Rule-breaking Behavior	-.03	.03	-.0981	.0426
Self-control	Parental Solicitation	PR Rule-breaking Behavior	-.01	.02	-.0607	.0344
Self-control	Rules	PR Rule-breaking Behavior	-.01	.02	-.0541	.0327
Self-control	Antisocial Peers	PR Rule-breaking Behavior	-.08	.04	-.1756	.0007

AR = Adolescent-reported; PR = parent-reported

Table 8. *Simultaneous Analyses.*

	Adolescent Report			Parent Report		
	b(SE)	*b**	*p*	*b(SE)*	*b**	*p*
Step 1						
Prior Rule-breaking Behavior	.82(.07)	.66	.00	.80(.06)	.76	.00
SES	-.04(.02)	-.12	.04	-.02(.03)	-.04	.51
Sex	.07(.04)	.10	.11	.04(.07)	.04	.51
Black	.16(.09)	.21	.08	-.06(.14)	-.05	.66
White	.16(.09)	.21	.08	-.01(.14)	-.00	.97
Step 2						
Self-control	-.17(.04)	-.27	.00	-.05(.07)	-.04	.48
Unsupervised Time	.06(.03)	.12	.05	-.01(.05)	-.01	.89
Parental Solicitation	-.03(.03)	-.06	.25	-.04(.05)	-.03	.55
Rules	-.02(.01)	-.07	.20	-.02(.03)	-.03	.55
Antisocial Peers	.12(.05)	.16	.01	.11(.08)	.09	.20
Step 3						
Self-control × Unsupervised Time	.01(.05)	.01	.89	.00(.10)	.00	.98
Self-control × Parental Solicitation	.02(.04)	.03	.67	-.05(.08)	-.04	.56
Self-control × Rules	.01(.03)	.02	.79	.04(.05)	.05	.46
Self-control × Antisocial Peers	-.23(.07)	-.21	.00	.04(.14)	.02	.79

Appendix

Self-control

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

1. I often act on the spur of the moment without stopping to think.
2. If things I do upset people, it's their problem, not mine.
3. I like to test myself every now and then by doing something a little risky.
4. Sometimes I feel I will take a risk just for the fun of it.
5. I frequently try to avoid projects that I know will be difficult.
6. I sometimes find it exciting to do things for which I might get into trouble.
7. I dislike really hard tasks that stretch my ability to the limit.
8. If I had a choice, I would almost always rather do something physical than something r
9. goal.
10. I almost always feel better when I am on the move than when I am sitting and thinking.
11. Excitement and adventure are more important to me than security
12. I try to look out for myself first, even if it means making things difficult for other people.
13. I'm more concerned with what happens to me in the short run than in the long run.
14. I will try to get things I want even when I know it's causing problems for other people.
15. When things get complicated, I tend to quit or withdraw.
16. I like to get out and do things more than I like to read or contemplate ideas.
17. I'm not very sympathetic to other people when they are having problems.
18. I seem to have more energy and a greater need for activity than most other people my age.
19. The things in life that are easiest to do bring me the most pleasure.
20. I don't devote much thought and effort to preparing for the future.
21. I lose my temper pretty easily.
22. Often, when I am angry at people, I feel more like hurting them than talking to them about why I am angry
23. When I'm really angry, other people should stay away from me.
24. When I have a serious disagreement with someone, it's usually hard for me to talk calmly about it without getting upset.

Unsupervised time

Never	Every once in a while	Few times a week	Most days	Every day

How often do you…

1. Watch TV or movies or listen to music with no adult around
2. Stay at home when no adult is there
3. Hang out at a friend's house when no adult is there
4. Hang out around the neighborhood with no adult around
5. Hang out at your house in a place where no adult can bother you
6. Spend time on-line with no adult around
7. Talk or IM on the phone (land or cell) with no adult around

Parental solicitation

Never	Hardly ever	Sometimes	Often	Always or Almost Every Day

For the next set of questions, "free time" means time that you are not at school.

1. How often does your mother start a conversation with you about your free time?
2. How often does your mother ask you to talk about things that happened during your free time (who you were with when not at home, free time activities, etc.)?
3. How often does your mother ask about things that happened during a normal day at school?
4. How often does your mother ask you about what happened during your free time?
5. How often does your mother have extra time to sit down and listen to you when you talk about what happened during your free time?

Rules

Do your parents have a rule?	
Yes	No

1. the types of movies you watch or music you listen to
2. how you spend your free time
3. hanging out at your friend's house when no adult is there
4. what you can or cannot do with friends
5. who you can and cannot be friends with
6. who can or cannot be your boyfriend or girlfriend
7. what websites you can or cannot visit

Antisocial peers

Never	Once in awhile	Sometimes	All the time

Do your friends…

1. Make good grades
2. Have a lot of fun
3. Get into fights with other kids
4. Get along with their teachers
5. Use bad language
6. Get along with their parents
7. Lie to their parents and teachers
8. Like to play video games
9. Get into trouble at school
10. Like to do things that make you scared or uncomfortable

Adolescent-reported antisocial behavior

Never	1 or 2 times	3 or 4 times	5 or 6 times	7 or more times

In the last month of school, how many times did you…

1. Break a rule at home?
2. Break a rule at school?
3. Break a rule somewhere other than home or school?
4. Get into trouble at home?
5. Get into trouble at school?
6. Get into trouble somewhere other than home or school?
7. Skip school?
8. Damage property?
9. Steal from someone?
10. Cheat on a test?
11. Shoplift?
12. Get suspended from school?
13. Get suspended from school?
14. Get drunk?
15. Smoked cigarettes?
16. Drink beer?
17. Drink wine or wine coolers?
18. Drink liquor?
19. Smoke marijuana

Parent-reported antisocial behavior

Never	1 or 2 times	3 or 4 times	5 or 6 times	7 or more times

In the last month of school…,

1. How many times did _____ break a rule at home?
2. How many times did _____ break a rule at school?
3. How many times did _____ break a rule somewhere other than home or school?
4. How many times did _____ get into trouble at home?
5. How many times did _____ get into trouble at school?
6. How many times did _____ get into trouble somewhere other than home or school?

VITA

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