

FAMILY PROCESSES, LOW SELF-CONTROL, AND DEVIANCE:  
A LONGITUDINAL TEST OF SELF-CONTROL THEORY

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FAMILY PROCESSES, LOW SELF-CONTROL, AND DEVIANCE:  
A LONGITUDINAL TEST OF SELF-CONTROL THEORY

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A Dissertation  
Submitted to  
the Graduate Faculty of  
Auburn University  
in Partial Fulfillment of the  
Requirements for the  
Degree of  
Doctor of Philosophy

Auburn, Alabama  
August 4, 2007

FAMILY PROCESSES, LOW SELF-CONTROL, AND DEVIANCE:  
A LONGITUDINAL TEST OF SELF-CONTROL THEORY

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## VITA

Li Huang, daughter of Weijue Huang and Zhide Wan, was born in Chengdu, Sichuan Province, P.R. of China on January, 26, 1972. She graduated from the No. 1 middle school in Yueyang, Hunan province, P.R. of China. She then attended Xiangtan University in the Hunan Province, where she graduated with a Bachelor degree in English in June, 1993. She entered graduate school at the Xiangtan University in September, 1997. She completed a Master's degree in History in June, 2000. After working for two years in the History department at Xiangtan University as a lecturer, she entered graduate school at Auburn University in August, 2002. During her graduate training, she worked with her advisor Dr. Vazsonyi in the Cross-Cultural and Intracultural Lab for the Comparative Study of Human Development and taught courses in the Human Development and Family Studies department.

DISSERTATION ABSTRACT

FAMILY PROCESSES, LOW SELF-CONTROL, AND DEVIANCE:

A LONGITUDINAL TEST OF SELF-CONTROL THEORY

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Doctor of Philosophy, August, 4, 2007

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122 Typed Pages

Directed by Alexander T. Vazsonyi

The purpose of the current study was to test a number of theoretical propositions by Self-Control Theory (Gottfredson & Hirschi, 1990). More specifically, the current study tested three theoretical propositions that included whether (1) parenting at 54 months predicted deviance at age 10/11, as mediated by self-control at age 8/9; (2) self-control increased during the first decade of life (over a seven year period from ages 4 to 11 years) as a result of socialization processes and pressures and whether parenting at 54 months predicted these changes; and (3) deviance decreased as a result of the development of self-control (over a seven year period from ages 4 to 11 years) and whether self-control predicted these changes.

The data for this study were from the National Institute of Child Health and Human Development (NICHD) Early Child Care Research Network Study of Early Child Care.

Three time points were selected for the current study (54 months, 3<sup>rd</sup> grade and 5<sup>th</sup> grade), largely to cover the first decade of life (age 4 to 11), but also as a function of available assessments of the main constructs of interest. Findings from the current study provide important new evidence about both the development of self-control and deviance, and they largely support the theoretically informed hypotheses. First, findings suggest that parenting was a predictor of children's self-control, and the relationships among parenting, children's self-control and deviance were in the expected directions, though indirect effects from parenting at 54 months to children's deviance in 5<sup>th</sup> grade through children self-control in 3<sup>rd</sup> grade were modest. Second, the results indicated that children's self-control trajectory increased over the seven year period. In addition, parenting at 54 months was a predictor of the self-control intercept only. Third, findings indicated that children's deviance trajectories decreased over the seven year period, and that self-control at 3<sup>rd</sup> grade was an important predictor of children's deviance trajectory (both the intercept and the slope). Findings are discussed in terms of their theoretical implications for Self-Control Theory, but also how they are situated vis-à-vis previous empirical work.

## ACKNOWLEDGMENTS

I would like to express my sincere thanks to my major professor, Dr. Alexander T. Vazsonyi, for his enormous amount of patience, expertise, and compassion throughout my doctoral program. Dr. Vazsonyi challenged me to develop my talents and skills in both research and teaching, and he also continuously provided excellent advice and support. I would also like to thank my committee members, Drs. Janice Clifford, Margaret K. Keiley, and Brian E. Vaughn; I greatly appreciate their guidance and support. Finally, I would like to thank my family. First, I would like to thank my parents, Weijue Huang and Zhide Wan for their immeasurable love and support. I could not have succeeded without them. Second, I would also especially thank my husband, Wen Yan, and for his patience while I was working on my dissertation. I also would like to thank my son, Kevin Z. Yan, whose smile always brightens my day and our future.

Style manual or journal used: Publication Manual of the American Psychological Association (5<sup>th</sup> Edition)

Computer software used: Microsoft Office Word 2003, SPSS 15.0; AMOS 7.0



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## I. INTRODUCTION

Published in 1990, Gottfredson and Hirschi's (1990) Self-Control Theory has received an impressive amount of empirical support (for detailed reviews of empirical studies, also see Pratt & Cullen, 2000; e.g., Arneklev et al., 1993; Evans et al., 1997; Gibbs et al., 1998; Grasmick et al., 1993; Hay, 2001; Junger & Tremblay, 1999; LaGrange & Silverman, 1999; Longshore et al., 1996; Paternoster & Brame, 1998; Pratt, Turner, & Piquero, 2004; Perrone, Sullivan, Pratt, & Margaryan, 2004; Piquero & Tibbetts, 1996; Vazsonyi, Pickering, Junger, & Helsing, 2001; Wood et al., 1993; Wright et al., 1999). There are several reasons why so much scholarship has followed the development of the theory. First, it provides a parsimonious explanation of various indicators of crime and deviance across the life course. Second, the theory has generated extensive controversies. And third, it emphasizes low self-control, a construct that is familiar to both criminologists and developmental psychologists.

Gottfredson and Hirschi (1990) developed specific theoretical propositions important for the etiology of deviance, delinquency, and crime. This has undoubtedly also influenced the current interest and surge in scholarship across disciplines. Based on work by classical theorists, for example, Beccaria and Bentham suggest that human beings are fundamentally self-interested and that they pursue pleasure and avoid pain. Thus, Gottfredson and Hirschi (1990) claim that individuals who lack self-control are at greater risk for engaging in deviant, delinquent, or criminal behaviors as well as

analogous acts (e.g., smoking, drinking, gambling, etc.). They also propose that early child rearing experiences as well as other socialization mechanisms (e.g., schools) help shape and develop a child's self-control, and thus, these indirectly decrease the likelihood of later deviant or criminal acts. In addition, Gottfredson and Hirschi (1990) suggest that self-control "rankings" between people remain relatively stable over time (e.g., Sampson & Laub, 1993). In fact, they propose that differences in self-control between people at age ten should be similar to differences at age twenty, thirty, and so on. On the other hand, this does not mean absolute levels of self-control remain stable and fixed once self-control is established.

Self-Control Theory has been tested by different scholars using different data sets and different methods. Research has reached a consistent conclusion, namely that low self-control is significantly and positively related to involvement in crime and deviance and vice versa. However, there still exist a number of inconsistent findings, unanswered questions related to the theory, including few studies that have focused on the parenting, self-control, and deviance links as well as limited attention to developmental processes, namely whether self-control is stable over time. One of key tenets of Self-Control Theory is that self-control is the result of adequate and efficient socialization efforts by parents or caretakers during the first few years of life. To date, only few empirical tests of this proposition exist (e.g., Cochran, Wood, Sellers, Wilkerson & Chamlin, 1998; Feldman & Weinberger 1994; Gibbs, Giever, & Higgins, 2003; Gibbs, Giever, & Martin, 1998; Latimore, Tittle, & Grasmick, 2006; Hay, 2001; Polakowski, 1994; Pratt, Piquero & Turner, 2004; Vazsonyi & Belliston, 2007); in addition, these studies provided

inconsistent findings about whether self-control is related to specific parenting efforts specified by Self-Control Theory.

Scholars have also empirically examined another proposition, namely the “stability assumption.” Only a small number of studies have addressed the question of stability or change in self-control over time (Arneklev et al, 1998; Hay & Forrest, 2006; Piquero & Turner, 2002; Winfree, Taylor, He, & Esbensen, 2006; Mitchell & Mackenzie, 2006), and most have focused on what amounts to stability in rank ordering over time as opposed to developmental changes (growth or decline, for example). Some evidence has supported stability; for example, Arneklev et al. (1998) found strong evidence of stability across a four month period by using a small convenience sample, Turner and Piquero (2002) also found moderate stability from ages 7 to 19 by using a national sample (National Study of Youth or NLSY). Most recently, Hay and Forrest (2006) found strong absolute and relative stability of self-control by using a national sample of U.S children age 7 to age 15. Hay and Forrest (2006) defined absolute stability in the following manner: “Absolute stability exists if people experience no within-individual changes in self-control at their age – the absolute level of self-control at one age is equal to the absolute level of self-control at a later age” (p.743). In contrast, relative stability focused on stability of individual self-control ranking order over time. In the current study, both the more commonly tested stability assumption was examined, namely whether rank order remained consistent over time, as well as potential within-individual developmental changes (growth or decline).

Scholars in the developmental literature have also paid attention to what amounts to be the same issue. Research over the past two decades has consistently revealed that

family or parenting processes (these two terms refer to the same thing; the difference is that family processes is used in criminology, while parenting is used in the developmental literature) are highly associated with children's problem behaviors (e.g., Amato & Fowler, 2002; Deater-Deckard, 2000; Fleming, Kim, Harachi & Catalano, 2002; Krohn, Stern, Thornberry & Jang, 1992; Loeber, Weissman & Reid, 1983; Loeber & Dishion, 1984; Loeber & Stouthamer-Loeber, 1989; Linver & Silverberg, 1995; Laird, Pettit, Dodge, & Bates, 2005). This work has also documented how parenting practices, such as failure to monitor or supervise a child or missing positive affective ties, are positively associated with a variety of problem behaviors (Amato & Fowler, 2002; Borawski, Levers-Landis, Lovegreen, & Trapl, 2003; Jacobson & Crockett, 2000; Patterson & Stouthamer-Loeber, 1984; Sampson & Laub, 1994; Simons, Wu, Lin, Gordon, Brody, Murry & Conger, 2000). In fact, investigators have examined the relationships among parenting, self-control/effortful control, and externalizing problems in children (e.g., Brody & Ge, 2001; Bradley & Corwyn, 2005; Eisenberg, Cumberland, & Spinrad, 1998; Gottman, Katz, & Hooven, 1997, Eisenberg, Zhou, Spinrad, Valiente, Fabes, & Liew, 2005; Zhou, Hofer, Eisenberg, Reiser, Spinrad, & Fabes, 2007). Most studies have provided evidence that self-control mediated the relations between parenting and children's outcomes, but also suggested that the relations between parenting and behavior problems are complex and that they involved self-regulation (or self-control). Though a number of different terms exist in the literature that describe the inability to regulate emotions and behaviors, a number of recent articles in the developmental literature have used these terms interchangeably. In fact, Eisenberg, Champion and Ma's (2004) review article on emotion-related regulation notes that "in general, in early studies on regulation

or self-control in infancy, regulation was assessed with measures of infants' coping with distress or with obstructions to their desires or movement" (p. 238). They also suggest that the important goal for future research is to develop consensus on the definition of emotion (or emotion-related) regulation. Thus, in the current literature review, emotion regulation and self-control were used interchangeably, largely as a function of how they have been used in the studies reviewed.

The main contribution of the current study is to test key theoretical propositions by Self-Control Theory. Two theoretical propositions included whether (1) children lacked self-control because of the absence of effective childrearing (effective childrearing means parents monitor their children, recognize deviance when it occurs, and punish such behaviors) and (2) to what extent does self-control (person-centered strategy) increase (positive growth) during the first decade of life. A third and parallel question sought to address whether deviance changed (declined) over the same time period during which self-control increased (positive growth). The current study was employ a multi-site, prospective longitudinal study based on the experiences of N = 1,155 children and their families; children's ages ranged from 54 months to about 11 years (5<sup>th</sup> grade).



## II. LITERATURE REVIEW

Self-Control Theory has received extensive empirical attention during the past decade, but few studies have tested its predictions about potential indirect effects by parenting on children's deviant behaviors, as mediated through self-control. In addition, few studies have examined potential development of self-control during the first decade of life by employing person-centered strategies to model change over time. Thus, longitudinal studies are needed to add these questions. The subsequent literature review has the following objectives. First, following a brief introduction of Gottfredson and Hirschi's Self-Control Theory, the major theoretical propositions of the theory, empirical findings, and criticisms of this theory are reviewed. Secondly, based on research not only in criminology, but also developmental psychology, the parenting, self-control, and deviance links are reviewed. Finally, studies about the potential stability of self-control are reviewed, along with relevant theoretical debates and empirical tests.

### *Self-Control Theory*

In this section, the main propositions of the theory, empirical work, as well as debates and criticisms are reviewed.

*Theoretical Propositions.* One important characteristic of Self-Control Theory is that it uses a parsimonious explanation to account for a variety of types of crime rather than specific explanations for different types of crime – property, violence, deviance, delinquency or white-collar crimes. Gottfredson and Hirschi (1990) identify low self-

control as one of the key probabilistic predictors of deviance, delinquency, and crime. In addition, they contend that low self-control has consistent effects on deviance, delinquency, and crime by gender as well as across racial and cultural/national groups.

Gottfredson and Hirschi (1990) describe that people who lack self-control as impulsive, aggressive, and self-centered. More specifically, they suggest that there are six interrelated elements of self-control. First, individuals with low self-control are characterized as impulsive (e.g., “tendency to respond to tangible stimuli in the immediate environment, to have a concrete ‘here and now’ orientation” Grasmick, et al., 1993). They tend to act on the spur of the moment by satisfying immediate desires and engaging in short-term pursuits. Second, people with weak self-control prefer easy or simple undertakings. Third, people lacking self-control are more likely selfish, insensitive, indifferent, and egocentric, something Grasmick et al. (1993) called self-centeredness. Fourth, people lacking self-control have little patience for frustrating events. Finally, people who lack self-control are risk takers and thrill seekers. Additionally, those with low self-control are said to prefer physical activities to mental/cognitive activities. Conversely, restrained individuals tend to be “cautious, cognitive, and verbal” (p. 89). In addition, all these characteristics form something akin to a “latent trait” which in interaction with situational opportunities gives rise to antisocial acts (Hirschi & Gottfredson, 1994).

Though Gottfredson and Hirschi (1990) focus on the association between low self-control and crime, they also argue that self-control differences are attributed to family socialization practices during early childhood. “By the age of 8 or 10, most of us learn to control such tendencies to the degree necessary to get along at home and

school... the differences observed at ages 8 or 10 tend to persist from then on. Good children remain good. Not so good children remain a source of concern to their parents, teachers, and eventually to the criminal system” (p. 90). Borrowing from the work of Patterson (1982), they suggest that there are three conditions necessary for adequate child-rearing to occur: Parents must monitor their child’s behavior; parents must recognize their child’s deviant behaviors; when deviant behaviors occur, parents must punish such behaviors. Thus, the major sources affecting an individual’s level of self-control are the actions by parents and other responsible adults interested in socializing the child.

*Empirical work.* Numerous studies have tested the self-control-crime or imprudent behavior link in U.S. and Canadian samples (e.g., Arneklev, Grasmick, Tittle, & Bursik, 1993; Arneklev et al. 1998; Burton, Cullen, Evans, & Dunaway, 1994; Burton, Cullen, Evans, Alarid, & Dunaway, 1998; Burton, Evans, Cullen, Olivares, & Dunaway, 1999; Cochran, Wood, Sellers, Wilkerson, & Chamlin, 1998; Evans, Cullen, Burton, Dunaway, & Benson, 1997; Gibbs & Giever, 1995; Gibbs, Giever, & Martin, 1998; Grasmick, Tittle, Bursik, & Arneklev, 1993; Forde & Kennedy, 1997; Keane, Maxim, & Teevan, 1993; Longshore, 1998; Longshore & Turner, 1998; Longshore, Turner, & Stein, 1996; Paternoster & Brame, 1998; Piquero & Rosay, 1998; Perrone et al., 2004; Sellers, 1999; Wright, Caspi, Moffitt, & Silva, 1999; Vazsonyi et al., 2001; Vazsonyi & Crosswhite, 2004) as well as other countries (e.g., Killias & Rabasa, 1997; Hwang & Akers, 2003; Wang et al., 2002; Vazsonyi et al., 2001; Vazsonyi et al., 2004). Pratt and Cullen’s (2000) meta-analysis of empirical investigations on the theory provide evidence of impressive empirical support. They suggest that the effects of self-control on crime

and deviance across studies are fairly stable, even when different samples and different research designs are used. The meta-analysis provides evidence that empirical tests of Self-Control Theory generally support the theory's main thesis, namely that low self-control predicts crime and analogous behaviors. It found that self-control had an effect size that consistently exceeded .20; compared with other studies that have examined predictors of criminal behavior (Andrews & Bonta, 1998; Gendreau et al., 1996; Lipsey & Derzon, 1998), this effect size ranked self-control as one of the strongest known correlates of crime. These findings are consistent with Gottfredson and Hirschi's (1990) generality hypothesis in that self-control not only predicts offending behaviors, but also analogous behaviors. Analogous behaviors are not criminal, but they are similar to criminal behaviors in that they satisfy immediate desires to the detriment of long-term consequences. Examples of analogous behaviors include smoking, using alcohol, using illicit drugs, having children out of wedlock, and engaging in risky sexual behaviors (Arneklev et al. 1993; Grasmick, Tittle, & Bursik, 1993; Burton et al., 1998; Cochran et al., 1998). Similarly, studies have demonstrated that self-control predicts involvement in deviant behaviors just as well as it does criminal behaviors (Evans et al., 1997; Paternoster & Brame, 1998). Therefore, Pratt and Cullen (2000) also suggest that Gottfredson and Hirschi's theory is not just a general theory of crime, but of deviant behavior as well.

Pratt and Cullen (2000) estimated the mean correlation between self-control and dependent variables to be  $r = .26$  for attitudinal and  $r = .28$  for behavioral measures of self-control. These figures did not appear to differ substantially and both appeared to point to a moderate, though significant, relationship between self-control and criminal

and analogous acts. In addition, rival theories were also tested in the same meta-analysis and were found to produce slightly lower, but still significant, effect sizes. The empirical evidence shows that low self-control is related to a variety of deviant behaviors. For example, Arneklev et al. (1993) examined the relationship between low self-control and imprudent behaviors. They used the same measurements as the Grasmick et al.'s (1993) study for self-control scale and also the six elements of low self-control. The authors found a modest but significant effect of a scale designed to capture the various components of low self-control on the index of imprudent behaviors. In addition, Wood, Pfefferbaum and Arneklev (1993) also tested self-control and its utility in explaining variation in interpersonal deviance, theft, vandalism, substance use and imprudent behaviors. They also used Grasmick et al.'s (1993) self-control scale. Their research provided strong support for self-control measure is an effective predictor of self-reported delinquency and imprudent behaviors.

*Criticisms of Self-Control Theory.* Self-Control Theory has had a major impact on the theoretical and methodological discourse in criminology. However, it has also been criticized by authors on both theoretical and methodological grounds. For example, Pratt and Cullen (2000) indicated that Gottfredson and Hirschi's claim that low self-control is the sole cause of crime was "overstated." Hay (2001) also mentioned that self-control theory does not appear have greater explanatory power than do other prominent theories of crime, such as social learning theory (Akers, 1998), social control theory (Hirschi, 1969; Sampson & Laub, 1993), and general strain theory (Agnew, 1992). Furthermore, Akers (1991) commented that Gottfredson and Hirschi tried to formulate a general theory; however, he also pointed out that Gottfredson and Hirschi criticized other theories

unfairly. For example, Gottfredson and Hirschi set up social learning theory as a “straw man,” arguing that their theory was incompatible with it. Akers indicated that if self-control theory suggests that we weigh the costs and benefits of a behavior before proceeding, this certainly implies social learning on some level. In fact, the strongest criticism by Akers (1991) was that the Self-Control Theory was logically weak. He pointed out that Gottfredson and Hirschi implied crime was employed as both an indicator of low self-control and an outcome of low self-control. However, Gottfredson and Hirschi did not discuss what other indicators of low self-control could be. He suggested that the theory predicted criminality with criminality, or that low self-control caused low self-control, and Akers (1991) recommended searching for other indicators of low self-control in order to remedy this.

More recently, Geis (2000) criticized Self-Control Theory on a number of grounds. Similar to Akers (1991) points, Geis (2000) also pointed out that that Self-Control Theory essentially tried to predict crime with measures of crime. This point is also suggested by other researchers (e.g. Caspi et al., 1994; Meier, 1995). Geis believed the evidence for this comes from Gottfredson and Hirschi’s definition of self-control - “the differential tendency of people to avoid criminal acts whatever the circumstances in which they find themselves” (p. 87). In addition, Geis (2000) also suggested that Self-Control Theory should limit itself to explain specific types of crime rather than the full compliment of deviant, delinquent, or criminal and analogous behaviors because it is unlikely that any etiological variable can be relevant for all crimes.

Hirschi and Gottfredson (2000) have addressed some of these criticisms in responses, and not “Theories, after all, are logical systems. Theories are circular. They

allow us to move from one place to another by definition and deduction. They are enormously important to the development of a field” (p.58). Further, they discuss the stability issue and assert that the stability of deviant behavior is not problematic in criminology or psychology. There are two empirical sources to support Gottfredson and Hirschi’s stability assumption: One is the relative stability of the age effect on crime, and the second is the positive correlation between levels of involvement in crime and delinquency measured at different periods of life. Thus, they suggest that the relative differences in the tendency for deviant behavior are stable over the life course.

In addition, Hirschi and Gottfredson (2000) also define Self-Control Theory by comparing it with other perspectives of crime. For example, “the adolescence limited” or “late starting” (and early finishing) delinquents “lack any personal propensity to commit crime” (Bartusch et al., 1997, p.17). Originally, Moffitt (1993) suggested the causes of criminal behavior among adolescence limited offenders differ from the causes among “life-course-persistent” offenders, and that they tended to specialize in different offenses. She suggested that life-course persistent offenders, compared with adolescence-limited offenders, engaged in a wider variety of offense types, including “more of the victim-oriented offenses, such as violence and fraud” (p. 695). However, based on a number of empirical studies (e.g., Dean et al., 1996; Laub et al., 1998; Simons et al., 1994), Gottfredson and Hirschi (2000) suggest that no evidence provided evidence that deviant behavior was time-limited or situation-specific, but rather that the data supported versatility and the stability of crime as proposed by Self-Control Theory.

In sum, although previous theoretical and empirical research has explored many aspects of Self-Control Theory, there remain inconsistent findings and unanswered

questions. Therefore, additional research needs to address some of these issues and that may or may not strengthen the body of work in this area. In the following section, empirical research on parenting, self-control, and deviance links will be reviewed.

*Parenting→ Self-control→ Deviance*

*Theoretical perspective.* According to Gottfredson and Hirschi (1990), the major cause of low levels of self-control is the absence of effective child rearing. In this section, the main theoretical idea about the links among parenting, self-control, and deviance are reviewed. The literature includes relevant empirical research as well as limitations from both criminology and the developmental literature.

Gottfredson and Hirschi (1990) point out that:

*The major cause of low self-control thus appears to be ineffective child rearing. Put in positive terms, several conditions appear necessary to produce a socialized child. Perhaps the place to begin looking for these conditions is the research literature on the relation between family conditions and delinquency. This research has examined the connection between many family factors and delinquency. It reports that discipline, supervision, and affection tend to be missing in the homes of delinquents, that the behavior of the parents is often 'poor' (e.g., excessive drinking and poor supervision, (Glueck and Glueck, 1950; 110-111); and that the parents of delinquents are unusually likely to have criminal records themselves (p. 97).*

Theoretically, Gottfredson and Hirsch (1990) argue that children lack self-control because of ineffective childrearing. As Hirschi (2004) describes the “child-rearing model:”

*This (Child rearing) model coincides beautifully with the (apparent) results of delinquency research, in which a lack of parental supervision, discipline, and affection are found to be major predictors of offending. The idea is that the child is taught “self control” by parents or other responsible adults at an early age, and that trait is subsequently highly resistant to extinction (p. 541).*

That is to say, at an early age, parents who do not monitor their children, recognize deviance when it occurs, and then punish such behaviors are more likely to have children



who are low in self-control and who are at greater risk for delinquency over the life-course. Gottfredson and Hirschi (1990) use the work by Glueck's (1950) to elaborate their ideas about the effects of early childhood socialization experiences and parenting processes. These socialization efforts include how parents socialize their children to achieve their goals within society, particularly during the first decade of life.

Theoretically, they propose parenting should play an important role in the explanation of children's deviant behaviors. Thus, there may exist indirect effects by parenting processes on deviance, through self-control, though there is no theoretical basis or prediction that all parenting effects are indirect.

*Does parenting matter?* Most criminologists and developmental psychologists agree that parenting shapes child and adolescent development in important ways. Some scholars now openly question whether "parents matter" in the development of their children. For example, Harris (1998) argued that effects of parenting on child outcomes have been overstated, in most instances, parents "don't matter" when it comes to the child's personality (see also Cohen, 1999; Wright & Cullen, 2001). According to Harris (1998), parenting does little to influence kids' wayward behavior when "peer effects" have been taken into consideration. Harris also argued that parental socialization practices are likely to be inconsequential once individual differences in parent and child temperament and genetic heritability are accounted for (Cohen, 1999; Pinker, 2002). She suggested that most of the studies on parenting practices only employed samples that measure one child and the mother (Rowe, 1994; Walsh, 2002). However, although arguments by Harris may provide parents with a certain measure of psychological absolution for the delinquency of their offspring, most of empirical evidence shows that

the parenting still “matters” for children’s delinquent behaviors (see also Akers, 1998; Currie, 1985; Loeber & Stouthamer-Loeber, 1986; Wright & Cullen, 2001). In fact, similar to Self-Control Theory’s main assumption, Sroufe (1990) has suggested that the child is “self” or “personality” must develop during early childhood, so that the child can learn how to manage frustration, accept delays and disappointments, operate in the environment autonomously and effectively, and cooperate and coordinate in give and take with others. In addition, the child must emotionally engage and share fun with others and regulate tension that is inevitable in complex social interactions. Competence in most of the tasks that are important in school and later life depends on a child developing these qualities. In early childhood, parents’ acceptance of their children’s growing autonomy and continued availability for closeness and reassurance, while sensitively following the children’s lead, are thought to be the key to these developments as they promote flexible self-regulation (Sroufe, 1995).

Furthermore, Sroufe (1995) also proposed that self-control develops rapidly during in the preschool years, and that self-control also has dramatic implications for emotional expression and regulation. During the preschool years, children show a much improved capacity to direct and even to monitor their own behavior (Kopp et al., 1983). Furthermore, children will also show more self-control in their relationships with parents. Based on Sroufe’s (1990) thought about parental sensitivity and support for autonomy, children whose interactions with their mothers in the early years have been sensitive and responsive as opposed to overstimulating, intrusive, dysregulating, or uninterested and detached, are better able to handle frustration, are less hyperactive, and show better attention during preschool years.

In summary, although some scholars criticize the current research on parenting and the conduct by offspring, most criminologists and developmentalists agree that parenting plays an important role in child socialization, and thus, in deviant behaviors (Akers, 1998; Currie, 1985; Loeber & Stouthamer-Loeber, 1986; Wright & Cullen, 2001; Perrone et al., 2004).

*Empirical Tests of Parenting, Self-Control, and Deviance Links in Criminology*

There exists a pervasive misinterpretation in the literature, namely that self-control is the one and only predictor of crime. Gottfredson and Hirschi do not indicate that parenting should have direct effects on crime and deviance or effects that are mediated by variables other than low self-control. As a matter of fact, Gottfredson and Hirschi (1990) have specified repeatedly that self-control is a probabilistic construct in the explanation of crime, deviance, and analogous behaviors. Similarly, the theory does not make any predictions related to whether parenting should maintain direct effects or only indirect effects on deviance, mediated through self-control. Thus, whether parenting processes maintain direct or indirect (or both) effects seems to be an empirical question. At the same time, few studies have directly assessed and tested the question of the importance of parenting on deviance. In fact, Hope, Grasmick, and Pointon (2003) point out that very few studies to date have tested the central tenet of Self-Control Theory, that is the parenting, self-control, and deviance links (e.g., Cochran, Wood, Sellers, Wilkerson, & Chamlin, 1998; Hay, 2001; Hope et al., 2003; Perrone et al., 2004; Polakowski, 1994; Pratt et al., 2004; Vazsonyi & Belliston, 2007).

Some of the findings based on these studies support Gottfredson and Hirschi's position that effective child-rearing practices are predictive of children's level of self-

control, while other studies provide mixed evidence. For example, Hay (2001) showed that parental monitoring, but not discipline, was significantly associated with child low self-control, even after controls were introduced for early childhood antisocial behaviors. He also analyzed an alternative model which combined the two parenting scales into one monitoring-discipline measure. He found that the combined measure of parental monitoring and discipline was significantly and inversely related to low self-control. His results also showed that low self-control only partially mediated the effects of parenting monitoring-discipline on delinquency. Similarly, Unnever, Cullen, Pratt (2003) used a sample of 2,437 middle school students and examined the impact of attention deficit hyperactivity disorder (ADHD) on parental management, self-control, and delinquency. They employed measures of parental monitoring and of consistent punishment as well as Grasmick et al.'s (1993) low self-control scale. The results also partially supported Gottfredson and Hirschi's view on the importance of parental management, self-control, and delinquency. They found that parental monitoring and consistent punishment were related to self-control or expected where higher levels of monitoring and consistent punishment were related with higher levels of self-control. However, their findings also indicated that parental monitoring had substantial direct effects on both self-reported delinquency and arrests. Thus, the authors believed the findings showed that Gottfredson and Hirschi's conceptualization of "why parents matter" may be too narrow. One possible reason is that specific causal parenting processes are not identified by Self-Control Theory. The other possibility is that parental monitoring limits offending not only by increasing self-control, but also by reducing criminal opportunities.

Perrone and colleagues (2004) also examined the relationships between parental efficacy, self-control, and deviance on data from the first wave of the Add Health study (National Longitudinal study of Adolescent Health). A total of 13, 536 cases were included in this study. The sample included a high proportion of minority youth in grades 7 to 12, who came from middle class and upper-middle-class backgrounds. The results from this study showed that parental efficacy was a major predictor for self-control in youth; this finding was consistent with Gottfredson and Hirschi's theoretical proposition about parenting and self-control link. However, they also found self-control did not completely mediate the relationship between parental efficacy and delinquency. In addition, the results indicated that the importance of family context, were significantly related to self-control, not simply patterns of parental monitoring and supervision, in the explanation of delinquency (see also Chase-Lansdale, Gordon, Brooks-Gunn, & Klebanov, 1998; Klebanov, Brooks-Gunn, Chase-Lansdale, & Gordon, 1997; Sampson, 1986).

Other studies provided evidence that largely supported Self-Control Theory. For instance, Feldman and Weinberger (1994) used a sample of 81 sixth grade boys and their families that were followed up four years later. In this study, they examined whether self-control mediated the link between ineffective parenting during preadolescence and subsequent adolescent delinquency. They used the Weinberger Adjustment inventory to measure children's level of self-control/self restraint. In addition, the children assessed ineffective parenting on multiple dimensions, including inconsistency, rejection, and power assertive/harsh discipline. The results showed that ineffective parenting was a significant predictor of low self-control, which in turn, predicted delinquent behaviors.

They also found that low self-control completely mediated the influence of ineffective parenting on delinquency.

Gibbs, Giever and Martin (1998) also completed a similar study. They collected data from 262 university students. Their results indicated that ineffective parenting had a significant indirect effect on their deviance index indicated through self-control scale. The results indicated that parental management did not directly affect deviance once low self-control was controlled. Furthermore, a later study by Gibbs and his colleagues (2003), the authors found evidence of partial mediation, a model where family processes maintained a significant direct effect on measures of deviance even when self-control was part of the model. In addition, Hope and Chapple (2005) examined the relationships among parenting, self-control, and adolescent sexual behavior by using the 1979 National Longitudinal Survey of Youth (NLSY 79) data set. This longitudinal sample of youth ages 14 to 21 included three measures of parental behaviors (maternal attachment, parental monitoring, and mother's age at first intercourse) as well as maternal reports of children's self-control. Findings provided evidence that self-control fully mediated the effects of parental behaviors (monitoring, attachment, and mother's age at first intercourse) on adolescent sexual behavior.

More recently, Vazsonyi and Belliston (2007) completed a comparative study of the links between family processes, low self-control, and deviance. Their samples included youth from Hungary, Japan, the Netherlands, Switzerland, and the United States (including a sample of rural African American youth). They found that family processes (closeness, support, and monitoring) had direct and indirect effects through low self-

control on deviance. This finding is consistent with Gibbs and his colleagues' (2003) results, but inconsistent with an earlier study by the same group.

Although these studies are a good start for developing a more complete understanding of the parenting, self-control, and deviance links, they are limited in a number of ways. First, there exist sample limitations. Different samples were used in these studies, such as national data sets (NLSY or the Add Health data set), and some relatively modest local samples, that were largely samples of convenience. Feldman and Weinberger's (1994) examination of 81 sixth-grade boys, while Cochran et al. (1998) used small college student samples, where students were enrolled in a physical education classes. Hay (2001) focused on a single urban environment and only 60 percent of the students completed and returned the necessary consent forms to take part in the study. Second, most studies focused on adolescents, where respondents were between the ages of 14 and 18, well beyond the "age requirement" delineated by Gottfredson and Hirschi for the key developmental changes in self-control. Thirdly, different measurement was used to assess the same construct, which ranged from single item indicators to latent constructs based on multi-item scales. Hope and Chapple (2005) employed an unconventional measure of self-control, generated from maternal assessments instead of adolescent self-reports. On the other hand, some of the research used Grasmick et al.'s (1993) self-control scale, while other work used a modified version; still others used Gresham and Elliott's (1990) Social Skills Rating Scale (SSRS) (e.g., Hay, 2001; Unnever, Cullen, & Pratt, 2003; Wright & Beaver, 2005).

In summary, Self-Control Theory suggests that monitoring and discipline are key in the understanding of how self-control develops during the first decade of life. Most

previous efforts have tested monitoring or discipline, and thus, were missing a key theoretical dimension, namely the affective one. Few studies have examined multiple parenting processes simultaneously, such as the effects of both attachment and monitoring, for example, in order to test their effect on self-control as well as their potentially direct or indirect effects on measures of crime and deviance (e.g., Benda, 2002; Cochran et al., 1998). The current study used a measure of parenting that included 15-items part of the Parent-Child Relationship Scale (Pianta, 1993) to test the longitudinal relationships among parenting, self-control, and deviance.

*Empirical Tests of the Links among Parenting, Self-control, and Deviance in the Developmental Literature*

Although Gottfredson and Hirschi (1990) emphasized the parenting-self-control link with respect to deviance and crime, developmentalists have also studied how parenting affects adolescent developmental processes for some time. Research over the past few decades has consistently revealed that family or parenting processes are highly associated with children's problem behaviors and delinquency (e.g., Amato & Fowler, 2002; Deater-Deckard, 2000; Fleming, Kim, Harachi & Catalano, 2002; Krohn, Stern, Thornberry & Jang, 1992; Loeber, Weissman & Reid, 1983; Loeber & Dishion, 1984; Loeber & Stouthamer-Loeber, 1989; Linver & Silverberg, 1995). This work has also documented that parenting practices, such as a lack of monitoring or supervision or a low affective relationship with children, are positively associated with a variety of problem behaviors (e.g. Amato & Fowler, 2002; Borawski, Levers-Landis, Lovegreen, & Trapl, 2003; Jacobson & Crockett, 2000; Patterson & Stouthamer-Loeber, 1984; Sampson & Laub, 1994; Simons, Wu, Lin, Goodon, & Conger, 2000). In addition, some researchers



have suggested that parental ratings of specific family processes, such as supervision or discipline, were more highly associated with official measures of adolescent delinquent behaviors in comparison to adolescent reports (Krohn, Stern, Thornberry, & Jang, 1992).

Brody and Ge (2001) used a longitudinal data and tested a model that linked parenting, self-control, and children's problem behaviors; participants included children, their mothers, and their fathers. The data were collected at 1-year intervals. The authors found that supportive parenting predicted children's self-control at two points in one year apart; children's self-control, in turn, was negatively related to children's problems adjustment, such as hostility, depression, and low self-esteem. The data did not support the possibility that children's self-regulation predicted later parenting. Gottman et al. (1997) found that parents who were supportive with regard to encouraging the appropriate expression of emotion and coaching had children who were relatively high in regulation and, in turn, low in aggression. Gottman et al. did not find a relationship between children's regulation and parental scaffolding/praising (at least when other variables were controlled in structural model).

Eisenberg and colleagues (Eisenberg et al., 2001; Eisenberg et al., 2003) used both concurrent data and data from two time points and found a pattern of results consistent with the hypothesis that children's emotion control mediated the negative relation between parental positive expressivity (with the child and in the family) and children's externalizing problem. Another example is a study by Eisenberg, Zhou et al. (2003), which found that maternal parenting processes were related to children's regulation and that regulation mediated the relation between maternal parenting processes and externalizing problems. More recently, Bradley and Corwyn (2005) also used the

National Institute of Child Health and Human Development (NICHD) Early Child Care Research Network's (2001) data set to examine the relations between parenting, self-control, and externalizing behavior among 1<sup>st</sup> graders. In this study, they used mother-child relationship to measure the target child's attachment to the parents, and a composite measure of maternal sensitivity. They also used the Home Observation for Measurement of the Environment (HOME) Inventory (Caldwell & Bradley, 1984) to measure parents' harshness. They found self-control mediated the relation between maternal harshness and mother-reported, teacher-reported behavior problems when gender, child temperament, family background, child care, and other parenting variables were controlled. More specifically, findings provided evidence that maternal harshness (mother report) at 54 months, self-control in first grade, and children's externalizing behavior in first grade were significantly associated, namely  $r = .32$  and  $r = -.28$ , respectively. In general, the findings from these studies suggest that the relations between parenting and behavior problems in children are complex, but that self-regulation or self-control appear to be a key in understanding the development of externalizing behaviors or problem behaviors.

In conclusion, previous studies on the parenting, self-control, and deviance links show that there exist inconsistent findings about these relationships. In addition, few previous studies have focused on young children. Thus, current study used the NICHD longitudinal data set to test these relationships by using three measurement points, namely at 54 months, in 3<sup>rd</sup> grade (8-9 years old), and in 5<sup>th</sup> grade (10-11 years old). Part of the reason for the focus on 54 month and older is largely related to the fact that there exists no measurement of a number of the main study constructs at previous time points.

The use of repeated measurement at these three time points using the same instruments stands the greatest chance of discovering relationships, if they exist.

*“Stability” of Self-control*

*Theoretical Considerations.* Gottfredson and Hirschi (1990) suggest that self-control is established early in the life-course, and that self-control is dynamic and changing before the age of eight or ten; after that, it becomes relatively stable. Some studies have shown that children with low self-control were more likely to be resistant to intervention effects after this critical developmental period (Paternoster et al., 1997; Sampson & Laub, 1995). As Hirschi and Gottfredson (2001) point out: “children in trouble with teacher in the 2<sup>nd</sup> and 3<sup>rd</sup> grades are more likely to be in trouble with juvenile authorities at 15 and 16; they are more likely to serve prison terms in their 20’s; they are more likely to have trouble with their families and jobs at all ages” (p. 87). However, Gottfredson and Hirschi did not discount the possibility that levels of self-control could change over time. In fact, they suggest that self-control “rankings” remain relatively stable over time (e.g., Sampson & Laub, 1993), starting at a very early age. However, self-control continues to be socialized in children until the age of about 10, after which time self-control does not change much.

In sum, Gottfredson and Hirschi claim that a child’s level of self-control is “fixed” by early adolescence. Although this is one of the main theoretical propositions in Self-Control Theory, almost no empirical work has tested for potential developmental changes in self-control, as a function of socialization pressures, during the first decade of life.

*Empirical Work.* Social scientists have been interested in the explanations of stability and change in self-control over time; however, few studies have addressed this issue, even

“simple” rank order stability over time (Arneklev et al, 1998; Hay & Forrest, 2006; Piquero & Turner, 2002; Winfree et al., 2006; Mitchell & Mackenzie, 2006). Some studies found evidence of stability; for example, Arneklev, Cochran, and Gainey (1998) completed a two-wave panel study in a convenience sample which measured college students’ self-control at two time points (approximately 4 months apart). Based on a variable centered strategy, they found that most of the dimensions of self-control were relatively stable across the four month period. In addition, Turner and Piquero (2002) extended the work of Arneklev et al. (1998) and examined the stability postulate by using a nationally representative probability sample; participants included both adolescents and young adults, they examined seven waves of the NLSY child-mother survey, restricting their subsample to those NLSY youths who reached the age of 15 by the end of 1994. They used Behavioral Problem Index (Zill & Peterson, 1986) to measure self-control. They found evidence partially supporting theoretical predictions, namely that there exist significant differences in levels of self-control between offenders and non-offenders, but they also found that among offenders, significant differences in the levels of self-control were only observed during the final two assessment periods (two years apart), while for non-offenders, the only significant difference was found at initial assessment. Most recently, Hay and Forrest (2006) used data from the Child and Young Adult Supplement of the National Longitudinal Study of Youth (NLSY79), a longitudinal study of more than 12,000 men and women between the ages of 14 and 21 years in 1979. They examined five data points that across 9-year period from age 7 to age 15. A 32-item scale Behavior Problem Index was used to assess a behavioral indicator of self-control (Zill & Peterson, 1986), much like Turner and Piquero (2002). Based on a group trajectory

modeling approach, their findings indicated that there existed strong absolute (rank order) and relative (growth/decline) stability of self-control for more than 80% of the sample. They also found that stability seemed to exist in this sample as early as the age of 7 in this sample.

Other studies have found evidence to the contrary. For example, Winfree and colleagues (2006) used data part of the longitudinal component of the National Evaluation of the Gang Resistance Education and Training program (Esbensen, Osgood, Taylor, Peterson, & Freng, 2001). In their study, they employed eight self-control items from Grasmick et al.'s (1993) low self-control measure. They examined the stability of self-control over five years. They also examined whether the levels of self-control change over time when they compared offenders to non-offenders. Their findings indicated that levels of impulsivity declined during the entire five-year period of study; risk seeking showed no clear pattern of change, actually increasing slightly between 1995 and 1997 and then declining to levels below those observed in the study's 1st year. Their findings do not support self-control as an immutable and stable propensity. Finally, Mitchell and MacKenzie (2006) also examined the stability hypothesis in a randomized experimental evaluation of Maryland's only correctional boot camp for adult offenders using Grasmick et al.'s (1993) self-control scale. Self-control was assessed at two time points (6 months apart). Results showed that the absolute level of self-control decreased over time. Analyses of the relative stability of self-control also indicated self-control was not stable over six months period.

The paucity of research in this area is also something Eisenberg and colleagues (2005) pointed out in their recent review; little longitudinal research exists on emotion-

related regulation, development, stability, and relations with other emerging processes, such as social competence, adjustment, and substance/alcohol problems. Based on longitudinal studies, some researchers have found evidence that effortful control and related constructs were associated with guilt, social competence, and measures of adjustment assessed over the course of several years (e.g., Caspi, 2000; Eisenberg et al., 2000a; Eisenberg et al., 2000b). For example, Eisenberg, Zhou, Spinrad, Valiente, Fabes, and Liew (2005) examined the links between children's effortful control (emotion regulation), parental warmth/positivity and expressivity, and externalizing behaviors over a three year period and found empirical support for the relationships hypothesized, including marked stability of the self-regulation construct from the mid-elementary school years into late elementary school or middle school. More recently, Zhou, Hofer, Eisenberg, Reiser, Spinrad, and Fabes (2007) also examined the developmental trajectories of attention focusing, attentional behavior persistence (part of effortful control) and externalizing problems for 356 children ages from 5 to 10 years from a pair of 3-wave (2 years apart) longitudinal studies. They found attention focusing remained relatively stable. In addition, they also found that attentional and behavioral persistence continued to show mean-level changes; three different trajectories were empirically identified for persistence, namely high and stable level of persistence (about 44% of the sample), moderate and generally stable persistence (about 31% of the sample), and start with low persistence at age 5 but a quadratic increase (about 25% of the sample).

A related line of inquiry, earlier work also examined the stability of ego-control and ego-resiliency. Block and Block (1980) completed a longitudinal study and focused on children at the ages of 3, 4, 5, 7, and 11 years and focused on ego-control and ego-

resiliency. They defined ego-control as “the threshold or operating characteristic of an individual with regard to the expression or containment of impulses, feelings, and desires” (p. 43). The data were collected between 1969 and 1971, and the number of participating children varied by year, ranging from 130 at age 4 to 104 by age 7. The authors found that individuals maintained their relative “rank” positions on ego-control and ego-resiliency over time.

Common across these efforts as well as efforts by Arneklev et al. (1998) and Turner and Piquero (2002) was a variable or construct centered approach which stands in contrast to the perhaps the more interesting and meaningful question posed in the current study, namely whether self-control remains stable over time based on a person centered strategy (Hay & Forrest, 2006; Zhou et al., 2007) that focuses on children during the first decade of life. In fact, variable centered versus person centered strategies are two different analytic approaches to examining potential changes in longitudinal data. Block (1971) pointed out that the main goal of a person centered approach is to identify groups or subsets of individuals who have similar configurations of traits. However, variable-centered approaches are used to understand differences between people and how group characteristics are associated with each other. Laursen and Hoff (2006) suggest that a “person centered approach is more appropriate when developmental trajectories are assumed to systematically differ across individuals or when developmental changes are assumed to carry different implications for long-term individual outcomes” (p. 385). In contrast, variable centered strategies are more appropriate for questions concerning relations among variables. In the current study, a person-centered strategy will be employed to address the question on the potential stability in self-control.

In general, previous research in criminology explored the stability of self-control over time, but it had both conceptual and methodological shortcomings. For example, studies that have considered age is the important key to examine the trajectory of self-control, however, they did not examine the early childhood. In addition, tests that addressed changes of self-control over time also suffer from a limited number of time points, in some cases only two. In the current study, based on a multisite, multiyear panel of children, some of these problems are more adequately addressed.

*Debates of Stability Issues.* As early as 1950s, criminologists started a dispute over the development of general theories of crime and typological theories. Those who favored a general theory believed that a variety of criminal acts were homogeneous to be explained by either a single factor or a very limited set of factors. More recently, the most parsimonious of these general theories of crime is the one advanced by Gottfredson and Hirschi (1990). In general, criminologists believe that individual differences in antisocial behavior are stable across the life course (Olweus, 1979; Caspi et al., 1987; Loeber, 1982; Robins, 1978; Huesmann et al., 1984; Gottfredson & Hirschi, 1990; Jessor et al., 1977, 1991). Robins (1978) summarized results from studies on four male cohorts by stating that “adult antisocial behavior virtually requires childhood antisocial behavior” (p. 611).

Opponents of this view held that apparent similarities between different crimes were simply a deception as criminological phenomena are too heterogeneous to be explained by a common set of predictors (Gibbons, 1975, 1979). For example, the field of developmental psychology has long been concerned with the continuity of maladaptive behaviors (Brim & Kagan, 1980; Caspi & Berm, 1990). Therefore, the longitudinal evidence on stability came from psychologists and others who study “antisocial



behaviors". A number of researchers (e.g., Moffitt, 1993; Loeber & LeBlanc, 1990; Nagin & Land, 1993; Patterson & Yoerger, 1993) have suggested that age is a key issue in understanding the etiology of deviance and antisocial behaviors. For example, Moffitt (1993) differentiated delinquency that peaks at mid-adolescence from the one which begins during early childhood and continued throughout adolescence and beyond. According to this perspective, child's risk emerges from inherited or acquired neuropsychological variation, difficult temperament, or hyperactivity etc. child's risks also included factors such as inadequate parenting, disrupted family bonds, and poverty etc. Furthermore, Sampson and Laub (1993, 1995) assumed that variation in offending throughout life is due to variations in social control. They also contended that individuals do exhibit significant changes in offending propensity over the life course, such changes, cannot be explained by childhood differences in the ability to resist engaging in crime and deviance. Based on the Glueck and Glueck (1950) data, Sampson and Laub (1993) contend that the acquisition of spousal and occupational attachment predicts changes in behavior above and beyond early childhood differences in offending and other misbehaviors.

Interestingly, Bartusch, Lynam, Moffitt, and Silva (1997) directly compared a stability hypothesis which they suggested was based on Self-Control Theory, and an age-graded explanation consistent with Moffitt's developmental theory. They used longitudinal data on male youth from age 5 to age 18 and found evidence which provided support for Moffitt's theory. Paternoster and Brame (1997) also tested Moffitt's age graded explanation versus the invariance premise and found evidence which did not exclusively support either explanation. In addition, researchers (e.g., Donovan et al.,

1988; Farrell et al., 2000) have also suggested that the structure of delinquent behaviors might vary across developmental periods, in that delinquent behaviors may be more differentiated during childhood than in adolescence (Gillmore et al., 1991; Long & Boik, 1993; McGee & Newcomb, 1992). The NICHD Early Child Care Research Network (2004) found five aggression trajectories from 24 months to third grade based on mother report of physical aggression, namely a very low stable trajectory, a low and stable trajectory, a moderate and declining trajectory, a moderate stable trajectory and a high stable aggression trajectory. Zhou et al. (2007) examined children between the ages 5 and 10 based on parents' and teachers' reports and found that the majority of children followed stable and declining trajectories between toddlerhood and middle childhood. Similarly, Schaeffer, Petras, Ialongo, Poduska, and Kellam (2003) found four different trajectories in African American boys from first to seventh grade, which they labeled as chronic high, moderate (and stable), and increasing aggression trajectories as well as a non-aggressive trajectories.

Though Moffitt's previous studies showed evidence for the differentiated delinquency explanation, it is quite plausible that Moffitt's differentiation may be related to Gottfredson and Hirschi's suggestion of within individual change, where individuals start on different levels or trajectories early in life and then follow these relative positions, compared to others, over the life-course. Moffitt's (in press) recently reviewed ten years of research about the life-course persistent versus adolescence-limited taxonomy and pointed out that the life-course persistent antisocial individual exists, at least during the first three decades of life. Tremblay et al. (2004) found a "high physical aggression" group constituting 14% of Canadian children followed from age 17 months

to 42 months. In addition, Brody et al. (2003) also found that a “chronic aggressive” group constituting 3% to 11% of children followed from ages 6 to 13 years in six different cohorts from 3 countries. Nagin et al. (1995) also found a “high-level chronic” group that include 12% of London males followed from age 12 to 32 years. Moffitt concluded that most research teams that have examined this issue have identified a persistent antisocial group. She also suggested some predictions from the taxonomy have not been tested sufficiently, such as criminal records or of incarceration in the two main groups, and that some of the findings have provided evidence not supporting the original taxonomy, and thus it required some revisions.

Sampson and Laub were among the first criminologists to study the sources of crime across the life course for a period exceeding 20 years. In previous research, they pointed out that individual traits and childhood experiences are important for understanding behavioral stability across the life span. They also emphasized that they began with children and followed their life paths to adulthood. What stands out about their recent work is that they found considerable heterogeneity in adult outcomes. That is to say, there are important variations in adult criminal trajectories that cannot be predicted from childhood experiences (Laub & Sampson, 1988; 1993; Sampson & Laub, 1990; 1993). In fact, most recently, Sampson and Laub (2006) concurred with Gottfredson and Hirschi’s (1990) view about the tendency of individuals to remain relatively stable over time in levels of deviance; they also concluded that there existed substantial heterogeneity in developmental pathways based on their study of children followed into old age (> 70 years old). Furthermore, they concluded that family

socialization and child rearing effects appeared to be key causal explanations of early delinquency and criminal conduct.

In general, it seems that most scholars have simply assumed (and perhaps misinterpreted) that the theoretical prediction by Self-Control Theory was one of “stability over time.” This is only partially true as previously elaborated. Self-control, in terms of rank ordering relative to others, should remain stable over time. However, Gottfredson and Hirschi also acknowledged the importance of “maturational reform,” namely the universal (across populations, cultures, and historical periods) finding that with age, deviance and crime decrease. Gottfredson and Hirschi (1990) suggested that the tendency of individuals to remain relatively stable over time in rates of deviance may imply the importance of early family socialization experiences. Thus, an important contribution of this study was the test of a “person-centered change hypothesis” which examined the change or growth/decline in both self-control and in deviance during the first decade of life. Based on theory, it was expected that self-control would increase (or low self-control decrease) during this critical developmental period, largely as a function of socialization effects; it was also expected that parallel to these changes, deviance would decrease during this time period, largely as a function of increases in self-control as well as direct socialization effects.

#### *Current Gaps in the Research on General Theory of Crime*

Researchers have examined the relations between parental socialization efforts and measures of adolescent deviance; they have found that parental and adolescent family process measures explain a large proportion of variance in adolescent deviant behaviors. At the same time, researchers have also have found that self-control might mediate

parenting effects through self-control on adolescent deviance. Work attempting to test that has been limited at best, and therefore, prior studies have a number of shortcomings: First, few studies pay attention to developmental processes. Second, research on testing stability hypothesis of Self-Control Theory is scarce. Third, most of the measures of parenting behaviors, children and adolescents' self-control and problem behaviors use the same method, youth self-reports. Forth, current research lacks longitudinal research methods. Therefore, the present study tested basic tenets of Gottfredson and Hirschi's (1990) Self-Control Theory in a longitudinal sample from National Institute of Child Health and Human Development (NICHD) Early Child Care Research and Youth Development. Based on theory and the published literature, the study aimed to test the importance of parenting processes and low self-control in the development of child and early adolescent deviance. More specifically, this study focused on parenting processes, measures of child and adolescent self-control, and measures of child and adolescent deviance. Figure 1 provides a "static" conceptual model that includes key study constructs and their inter-relationships. In addition, though a number of recent studies in the criminological and developmental literatures have addressed the stability question in both self-control and deviance measures over time, very few have focused on potential growth or decline in self-control and in deviance over time, particularly between the early childhood and early adolescent years.

### *Research Questions/Hypotheses*

Hypothesis I:

Figure 1 shows the longitudinal relations among parenting processes, self-control, and child deviant behaviors. In the first hypotheses, the study tested the longitudinal relationships between parenting, low self-control, and deviance as proposed by Self-Control Theory (Gottfredson & Hirschi, 1990), but also as suggested by recent empirical work in the developmental literature on effortful control and externalizing behaviors (Eisenberg et. al., 2005).

Figure 1.  
Conceptual Model of the Longitudinal Relations among Parenting Processes, Self-Control, and Deviance

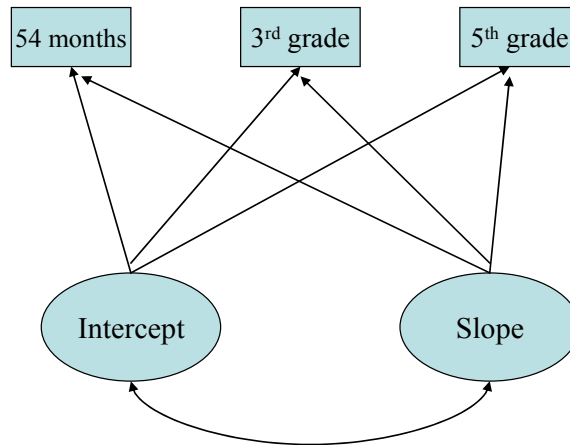


It was hypothesized that indirect effects would be found by parenting on deviance, through low self-control. More specifically, it was expected that there exist indirect effects of parenting (at 54 months) on early adolescent deviance in 5<sup>th</sup> grade, that child self-control in 3<sup>rd</sup> grade would mediate the relationships between parenting and early adolescent deviant behaviors (path a and b).

Hypothesis II:

The second hypothesis focused on developmental changes in self-control over time. Though some literature has provided evidence that self-control may be established during the first few years of life, theoretical predictions suggest that self-control continues to change over the course of the first decade of a child's life, and thus, is only established by late childhood or early adolescence. Very limited empirical evidence exists which has followed youth during childhood and early adolescence to address this question. Thus, in the current study, based on theoretical propositions, it was hypothesized that self-control would positively change (growth) over time (54 months, 3<sup>rd</sup> grade, and 5<sup>th</sup> grade) (see Figure 2). In addition, it was hypothesized that some of this positive change would be related to the source of the development of self-control, namely that parenting at 54 months would be predictive of children's positive developmental self-control trajectories.

Figure 2.  
Latent Growth Curve Model for Self-Control



### Hypothesis III:

For the third and final hypothesis, the study focused on children's deviance trajectories. Parallel to the hypothesized positive growth in self-control over time, it was also expected that deviance would "proportionately" decline. Again, almost no previous empirical work has examined this issue on a sample of children. Thus, it was hypothesized that children's deviance trajectories would decrease over time. In addition, again based on theory, it was also expected that children's self-control at 54 month would predict deviance trajectories over the three time points (54 months, 3<sup>rd</sup> grade and 5<sup>th</sup> grade).



### III. METHODS

#### *Participants*

The data for this study were based on the National Institute of Child Health and Human Development (NICHD) Early Child Care Research Network Study of Early Child Care. Data collection commenced in 1991 when participating children were one month old and has continued (in phases 1, 2, and 3) through sixth grade. Over this period, research assistants from the 10 data collection sites have seen each child at home, in child care, in school, and in a laboratory setting. Families lived in Little Rock, AR; Irvine, CA; Lawrence, KS, Boston, MA; Philadelphia, PA; Pittsburgh, PA; Charlottesville, VA; Morganton, NC; Seattle, WA; and Madison, WI. Of the  $N = 8,968$  mothers who gave birth during the sampling period,  $n = 5,416$  (60%) met the eligibility criteria. Mothers were required to be healthy, older than 18 years, and conversant in English with a singleton child whose birth was normal and uncomplicated; in addition, families had to be residing in a reasonably safe neighborhood less than 1 hour from the research site and not planning to move. Of the mothers,  $n = 130$  (1%) refused to be interviewed, and  $n = 308$  (3%) refused to be contacted again. Of the  $n = 5,416$  eligible families,  $n = 3,015$  (56%) were selected using a conditional random sampling plan that ensured that the recruited families reflected economic, educational, and ethnic diversity. Of the  $n = 3,015$  families selected for participation,  $n = 1,526$  (51%) agreed to participate. The remaining  $n = 1,489$  families could not participate for a variety of reasons: 60 infants remained hospitalized for 7 days postpartum, 91 families planned to move, 512 could not be

contacted, 641 refused, and 185 had other reasons (most of these said they did not have the time). Of the n = 1,526 families who agreed to participate, n = 1,364 (89% completed the initial data collection visit and gave signed consent when the child was 1 month old. Retention of the sample from one month of age through first grade was excellent; n = 1,103 families continued participation through Phase 2. Then, n = 1,077 (79%) families remained in the study by phase 3, which effectively followed children and families from the second through sixth grades.

Of the n = 1,364 families that completed initial data collections at 1 month, complete parent and child data are available on n = 985 families - when children were in first grade. In comparing the n = 985 families to the n = 379 families where complete data were unavailable, participant's mothers were slightly older on average (28.6 years versus 26.38 years), better educated (14.4 years versus 13.7 years) and less likely to be of minority status (17% versus 27%).

### *Procedures*

Information about parents and children was obtained from mothers using face-to-face interviews when the child was 1,6,15, 24, 36, 54, and 60 months old. Observations of mother child-interaction were made at the same data collection points. Information was also obtained from telephone interviews done when the children was 3,9,12, 18, 21, 27, 30, 33, 42, 46, 50, 60, 66, 72, 84, and 90 months old, including information about the family context and child care. Information about the child and classroom context was obtained from teachers during the spring semester of first grade through sixth grade. The entire data collection protocol was reviewed by a steering committee supervised by the NICHD and was reviewed annually by institutional review boards of the ten participating

institutions responsible for data collection. The current study only included data from three time points, namely 54-month children, 3rd, and 5th grade. This was largely a function of measurement issues at these time points; measurement of the key study constructs was consistent, an important prerequisite for longitudinal model tests.

### *Measures*

*Demographic variables.* During home interviews at 1 month, mothers reported the study children's race/ethnicity. The recruited families included 24% ethnic-minority children (including 13% African American, 6% Hispanic, and 5% others). Family type was coded as traditional (two parents, two-parent extended or extended & augmented family and two-parent augmented family) versus "non-traditional" (step-father family, single parent nuclear family, single parent extended or extended and augmented family, single parent augmented family, nontraditional nuclear family, nontraditional step-father family, nontraditional extended or extended & augmented family, nontraditional augmented family, two-parent alternate caregiver family, single-parent alternate caregiver family) at the 1-month visit and was updated at each assessment (two parents: 90.2%; other: 9.8%). Sex of child was coded 0 = male and 1 = female (male: 49.4%, female: 50.6% in current study). In the current study, mothers reported whether their family received food stamp support from the government; thus, based on this, children's SES was coded as 0 = low (68.8%) and 1 = average (31.2%) SES.

*Parenting.* In the current study, though a number of different parenting instruments and measures are available, Parent-Child Relationship Scale (Pianta, 1994) were selected, largely as a function of when they were employed (assessment times) and whether they were repeated subsequently, to facilitate longitudinal data analysis.

At 54 months, mothers were asked to complete a 30-item questionnaire designed to assess the target child's attachment to the parent. The form was adapted from the Student-Teacher Relationship Scale (Pianta, 2001; see Appendix C). Items were rated using a 5 point Likert scale. For children in 3<sup>rd</sup> and 5<sup>th</sup> grades, parenting was measured by the 30 item Parent-Child Relationship Scale (Pianta, 1994). Initially these items were selected to measure three dimensions of warmth/security, anger/dependency, and anxiety/insecurity. Since 3<sup>rd</sup> and 5<sup>th</sup> grade assessments only used 15-items short forms, a 15-item version was employed for the current study to maintain consistency in measurement over time. The 15-items included the parent's feelings and beliefs about his/her relationship with the child as well as items about the child's behavior toward the parent. Based on conceptual reasons and an interest in the warmth/security dimension as well as some data reduction analyses described subsequently, only eight items were used, each rated by mothers on a 5-point Likert scale ranging from 1= definitely does not apply to 5 = definitely applies (e.g., "children spontaneously shares personal information with me"). The reliability estimates for the total Parent-Child Relationship scale ranged from  $\alpha = .81$  to  $\alpha = .87$  in previous work (e.g., Bradley & Corwyn, 2005). The alpha level ranged from  $\alpha = .63$  to  $\alpha = .73$  for the current study across the three time points.

*Self-Control.* Self-control was measured by the Social Skills Rating System (SSRS, Gresham & Elliott, 1990; see Appendix C). Mothers completed the measure. The SSRS-Parent Form consists of three parts, namely social skills, problem behaviors, and academic competence scales. The social skill component includes three subscales, namely cooperation, assertion and self-control. The current study only focused on the self-control subscale. It includes 10 items rated by mothers on a 3-point Likert-type scale

(0 = never, 1 = sometimes, 2 = very often; e.g., “controls temper when arguing with other child”). The alpha ranged from  $\alpha = .82$  to  $\alpha = .87$  for the self-control subscale in previous research (e.g., Bradley & Corwyn, 2005). In the current study, reliabilities ranged from  $\alpha = .79$  to  $\alpha = .82$  over the three time points.

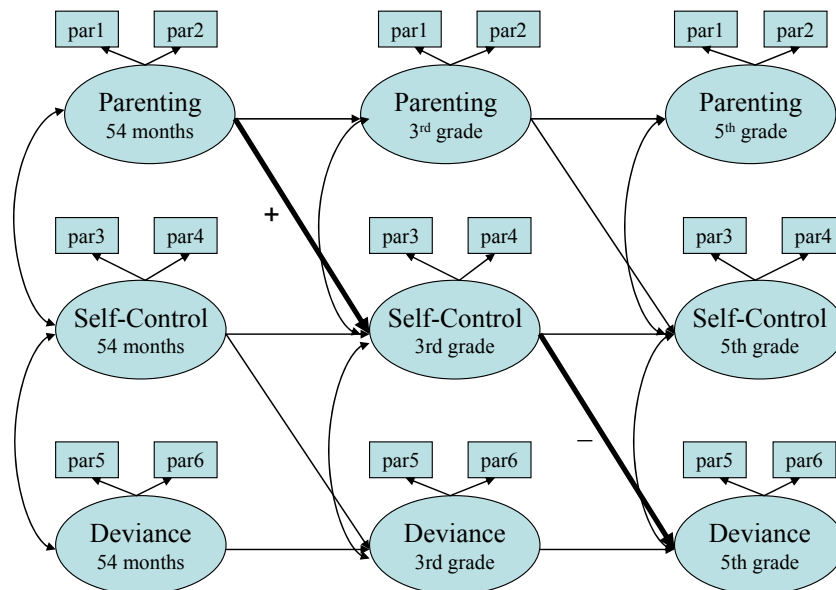
*Deviance.* The Child Behavior Checklist (CBCL, parent report) (Achenbach, 1991 see Appendix A) was used to assess childr and early adolescent deviant behaviors. The measure includes 33 items that describe a variety of deviant behaviors, including “lying or cheating,” “steals at home,” “physically attacks people,” and “gets into many fights”. Mothers rated each item on a 3-point scale (0 = “not true”, 1 = “somewhat or sometimes true”; and 2 = “very true or often true”). Test-retest reliability estimates indicated good internal consistency in previous work (statistic  $\alpha = .76$  to  $\alpha = .93$  (Achenbach, 1991). In the current study, reliability estimates were adequate over the three time points ( $\alpha = .78$  to  $\alpha = .80$ ).

#### *Plan of Analysis*

1. Initial descriptive statistics of all the variables/measures were completed along with reliability estimates the main study constructs (i.e., parent-child relationship, self-control, and a deviance measure). Additional analyses included data reductions analyses (EFAs) that allowed an assignment of items to parcels and to ascertain whether any redundancy existed in the parenting measures. It also included the development of measurement models for subsequent latent modeling as part of specific hypothesis tests.
2. In order to test whether there existed indirect effects for measure of parenting on deviance, through low self-control, Structural Equation Modeling (SEM)

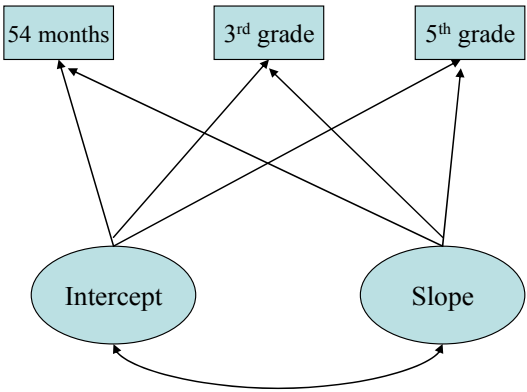
was used in current study. Figure 3 displays the analytic structural model that was tested in AMOS 7.0 (Arbuckle, 2006). Item parceling was used to identify latent constructs. Two parcels were developed for each parenting construct, for self-control, and for the deviance latent constructs (Little et al., 2002). For this purpose, half of the item compliments were assigned to the first parcel, while the other half to the second based on item loadings from exploratory factor analyses. AMOS implements the FIML procedure to handle missing data; this approach is considered most efficient and introduces the least amount of bias in parameter estimates in comparison to other missing data procedures (e.g., listwise deletion or mean imputation; Schafer & Graham, 2002; Wothke, 2000).

Figure 3.  
Analytic Model of the Longitudinal Relations among Parenting Processes, Self-Control, and Deviance



3. In order to examine for potential changes or growth in self-control over time, as well as changes or declines in deviance trajectories, two unconditional latent growth curve models were tested in AMOS. Building on the strengths of structural equation models, growth curve procedures provide a means of model development through the use of repeated observations over time. For these models, maternal reports of self-control and of deviance were included, thus resulting in the analytic model presented in Figure 2.
4. In addition, and consistent with theory, two additional latent growth curve models that included predictors were tested (conditional growth models). More specifically, for hypothesis II, tests included whether parenting predicted developmental trajectories of self-control, while for hypothesis III, whether self-control predicted deviant behavior developmental trajectories. Figure 4 presents a simple unconditional growth model that was used to examine change trajectories in self-control and in deviance over three points in time. Findings from this initial model provided a mean intercept factor as well as a mean slope factor for self-control or deviance, respectively. Analyses also examined variances of both intercept and slope factors. In a second analysis for each dependent measure, a conditional model was tested which assessed a parenting construct predicting changes in self-control trajectories (hypothesis I) and a self-control construct predicting deviance trajectories (hypothesis II), respectively.

Figure 4.  
Unconditional Latent Growth Curve Model (Self-Control or Deviance)





## IV. RESULTS

### *Initial Analyses*

In order to build measurement models for specific hypothesis tests, as the first step, a series data reduction analyses, exploratory factor analyses (EFAs), were used for three the main constructs at each of the three time points, which included the Parent-Child Relationship measure, the self-control measure part of the Social Skill Rating Scale (SSRS), and items identified as indicators of deviance part of the Child Behavior Check List (CBCL). Analyses were completed with SPSS 15.0 and AMOS 7.0.

First, an exploratory factor analysis was completed to examine mother report parent-child relationship when children were 54 months old, in 3<sup>rd</sup> grade, and in 5<sup>th</sup> grade. Because only a 15-items short form of the Parent-Child Relationship questionnaire was used at 3<sup>rd</sup> and 5<sup>th</sup> grade, the same short form was used at each time point. Carver et al. (1989) recommended using Principal Components Analysis (PCA) as an extraction method with an oblique rotation to allow for correlation among factors. For the present study, a PCA with an orthogonal rotation method (i.e., varimax with Kaiser Normalization) was used to complete some exploratory factor analyses of the 15 item parent-child relationship measure at the three different measurement occasions. Consistent with the three dimensions described by Pianta (1994), namely warmth/security, anger/dependence, and anxiety/insecurity, a three-factor solution was found. In order to sharpen the focus of the parent-child relationship quality measure, and

consistent with a conceptual interest in the affective dimension of the parent-child relationship, particularly given the age of the child at the initial two measurement points, a decision was made to only examine the warmth/security dimension. This dimension was represented by the eight items part of the initial factor. As shown in the Table 1, all factor loadings of these items were above .35 across these three time points, except for one item (i.e., my child is uncomfortable with physical affection or touch from me). This item was negatively worded, and thus it was necessary to recode it for use in the scale score. Similar exploratory analyses were conducted on the self-control measure based on the Social Skill Rating System (SSRS) and the deviance measure based on the Child Behavior Checklist (CBCL). Findings provided evidence that the factor loadings for the items were located on a single factor and that this was the case consistently over the seven year period (see Tables 1, 2 and 3).

The main study constructs at each of the three time point were computed by averaging the individual items. As mentioned, previous research has indicated that the composite scores of an item parcel is normally more reliable than single item scores, and thus the use of parcels will also improve model fit (Bentler & Chou, 1987). As recommended by Little, Cunningham, and Shahar's (2002) research, an item-to-construct balance method was used in the larger SEM model; the purpose of this method was to derive parcels that were balanced in terms of their difficulty and discrimination. Parcels were developed and computed based on findings from EFAs. In order to develop the parcels, the items for each scale were rank-ordered from highest to lowest loadings based on exploratory factor analyses and then alternatively assigned to the first and second parcels for each main study construct (see Tables 1, 2 and 3). For example, the parenting

measure included 8 items. The highest score was assigned to the first parcel, while the second highest was assigned to the second parcel; then, the third highest was assigned to the first parcel again, while the fourth highest was assigned to second and so on. Each parenting parcel included four items. Though for the parenting measure, factor loadings across the three time points were similar, they were not identical for some items. Rather than developing idiosyncratic parcels for each time point, a decision was made to use the results from EFAs on 3<sup>rd</sup> grade data to develop the two parcels. Thus, parcel 1 included following items: “I share an affectionate, warm relationship with my child” (item 1), “If upset, my child will seek comfort from me” (item 2), “When I praise my child, my child beams with pride” (item 5), and “My child openly shares his/her feelings and experiences with me” (item 8). Parcel 2 included: “My child is uncomfortable with physical affection or touch from me” (item 3), “My child values his/her relationship with me” (item 4), “My child spontaneously shares personal information” (item 6), and “It is easy to be in tune with what my child is feeling” (item 7).

Identical procedures were used to develop two parcels for the self-control measure and the deviance measure. More specifically, for self-control measures, parcel 1 included: “Avoids situations that are likely to result in trouble” (item 3), “Controls temper when arguing with other children” (item 5), “Responds appropriately teasing from friend” (item 6), “Cooperates with family member without being ask” (“follows your direction” for 54 months kids) (item 7), and “Speaks in an appropriate tone of voice at home” (item 10). Parcel 2 included: “Controls temper/conflict with you” (item 1), “Responds appropriately when pushed or hit by other children” (item 2), “Politely refuses unreasonable request” (item 4), “Receives criticism well” (“Following rules when

playing game” for 54 months kids) (item 8). For the deviance measure, parcel 1 included: “Stubborn, sullen or irritable” (item 1), “Argues a lot” (item 4), “Cruelty, bullying or meanness to others” (item 6), and “Doesn’t seem to feel guilty when misbehaving” (item 8). Parcel 2 included: “Temper tantrums or hot temper” (item 2), “Disobedient at school” (“Sudden changes in mood or feelings” for 54 months kids) (item 3), “Demands a lot of attention” (item 5), and “Lying or cheating” (item 8).

Next, descriptive statistics for the measures were computed. These statistics are presented in Table 4. They include means, standard deviations, skewness, kurtosis, and reliabilities for each of the measures. The results showed that the reliabilities of the variables ranged from  $\alpha = 0.63$  to  $\alpha = 0.82$ . Prior to analyzing data, the distributions of self-control variables across the three time points were examined. Enders (2001) suggests that the full information maximum likelihood (FIML) procedure in AMOS provided the best estimates for nonnormal data; however, he also pointed out that model rejection rates are inflated because of biased standard error estimates. Results indicated that for the self-control scores, skewness estimates ranged from -0.15 to 0.09 and kurtosis estimates ranged from -0.27 to -0.62; for the deviance scores, skewness estimates ranged from 0.67 to 1.20 and kurtosis estimates ranged from 0.25 to 1.27. Finally, for parenting, skewness ranged from -1.32 to -1.57 and kurtosis from 3.38 to 4.64. These latter statistics indicated moderate levels of skew and only slight departures from normality. Nevertheless, to be conservative, based largely on guidelines provided by George and Mallery’s (2000) who suggest that if variables are skewed more than  $\pm 1$  data transformation is necessary, the variables were transformed using log and exponential functions (Tabachnick & Fidell, 1996).

Secondly, bivariate correlations among parenting, self-control, and deviance were examined computed. Listwise deletion was employed for this analysis. Results showed that all the correlations for the three time points were statistically significant and in the expected direction. Maternal parenting was positively associated with self-control and negatively associated with deviance, while self-control was negatively associated with deviance (see Table 5).

Model tests and latent growth models were examined after transforming the skewed data to test whether this affected model fit or parameter estimates. Findings indicated that neither model fit nor parameter estimates were affected and that results were highly similar based both on the original and the transformed data. For example, in the test of the longitudinal relationships among parenting, self-control and deviance, the results indicated that adequate model fit based on the original data:  $\chi^2 = 335.34$ ,  $df = 113$ ,  $\chi^2/df = 2.97$ ,  $CFI = 0.97$ , and  $RMSEA = 0.047$ . On the other hand, fit based on the transformed and normalized data was also adequate and largely the same, namely  $\chi^2 = 347.56$ ,  $df = 113$ ,  $\chi^2 /df = 3.08$ ,  $CFI = 0.98$ , and  $RMSEA = 0.042$ . In addition, parameter estimates remained largely unchanged (e.g., the parameter estimates for parenting at 54 months and parenting at 3<sup>rd</sup> grade was  $\beta = 0.55$  based on the original data and  $\beta = 0.60$  for transformed data; parenting in 3<sup>rd</sup> grade to self-control in 5<sup>th</sup> grade was  $\beta = -0.12$  for both the original and transformed data). Thus, due to the apparent robustness of findings despite some evidence of nonnormality, the original, untransformed data were used in all analyses.

Table 1. Factor Loadings of Parenting Measures

	54 months	3 <sup>rd</sup> grade	5 <sup>th</sup> grade
1. I share an affectionate, warm relationship with my child	0.48	0.63	0.65
2. If upset, my child will seek comfort from me	0.53	0.61	0.70
3. My child is uncomfortable with physical affection or touch from me	-0.37	-0.36	-0.38
4. My child values his/her relationship with me	0.56	0.67	0.63
5. When I praise my child, my child beams with pride.	0.50	0.38	0.47
6. My child spontaneously shares personal information	0.58	0.62	0.71
7. It is easy to be in tune with what my child is feeling.	0.63	0.61	0.65
8. My child openly shares his/her feelings and experiences with me	0.67	0.74	0.72

Table 2. Factor Loadings for Self-Control Measurement

	54 months	3 <sup>rd</sup> grade	5 <sup>th</sup> grade
1. Control temper/conflict with you	0.63	0.58	0.54
2. Responds appropriately when pushed or hit by other children.	0.39	0.63	0.55
3. Avoids situations that are likely to result in trouble.	0.53	0.60	0.54
4. Politely refuses unreasonable request	0.61	0.52	0.47
5. Controls temper when arguing with other children.	0.63	0.69	0.71
6. Respond appropriately teasing from friend	0.53	0.65	0.64
7. Cooperate with family member without being ask (Follows your directions for 54 months kids.)	0.69	0.58	0.61
8. Receive criticism well (Following rules when playing games for 54 months kids)	0.61	0.58	0.60
9. Ends disagreements with you calmly.	0.58	0.68	0.70
10. Speaks in an appropriate tone of voice at home.	0.63	0.59	0.54

Table 3. Factor Loadings for Deviance Measurements

	54 months	3 <sup>rd</sup> grade	5 <sup>th</sup> grade
1. Stubborn, sullen or irritable	0.75	0.72	0.73
2. Temper tantrums or hot temper	0.73	0.71	0.72
3. Disobedient at school (Sudden changes in mood or feelings for 54 months kids)	0.69	0.55	0.56
4. Argues a lot	0.65	0.68	0.66
5. Demands a lot of attention	0.62	0.62	0.64
6. Cruelty, bullying or meanness to others	0.56	0.61	0.63
7. Lying or cheating	0.52	0.60	0.62
8. Doesn't seem to feel guilty misbehave	0.51	0.56	0.60



Table 4. Descriptive statistics for the main constructs variables

Variable	# of items	N	Mean	SD	Skewness	SE	Kurtosis	SE	$\alpha$
Parenting 54 months	8	1,077	4.66	0.35	-1.57	0.08	3.38	0.15	0.63
Parenting 3 <sup>rd</sup> grade	8	1,028	4.25	0.32	-1.32	0.08	4.64	0.15	0.66
Parenting 5 <sup>th</sup> grade	8	1,020	4.20	0.35	-1.39	0.07	3.41	0.15	0.73
Self-Control 54 months	10	1,057	1.30	0.31	0.09	0.07	-0.33	0.15	0.79
Self-control 3 <sup>rd</sup> grade	10	1,028	1.36	0.34	-0.15	0.07	-0.63	0.15	0.82
Self-Control 5 <sup>th</sup> grade	10	1,021	1.39	0.33	-0.12	0.07	-0.27	0.15	0.81
Deviance 54 months	8	1,057	0.50	0.35	0.68	0.07	0.26	0.15	0.78
Deviance 3 <sup>rd</sup> grade	8	1,026	0.37	0.32	0.88	0.08	0.29	0.15	0.79
Deviance 5 <sup>th</sup> grade	8	1,020	0.31	0.32	1.20	0.07	1.28	0.15	0.80

Table 5. Correlations of Parenting, Self-control, and Deviance

Variables	1	2	3	4	5	6	7	8	9
1. Parenting (54 months)									
2. Parenting (3 <sup>rd</sup> grade)	.34**								
3. Parenting (5 <sup>th</sup> grade)	.29**	.49**							
4. Self-control (54 months)	.32**	.26**	.21**						
5. Self-control (3 <sup>rd</sup> grade)	.30**	.39**	.25**	.53**					
6. Self-control (5 <sup>th</sup> grade)	.23**	.29**	.28**	.49**	.70**				
7. Deviance (54 months)	-.19**	-.16**	-.11**	-.39**	-.38**	-.38**			
8. Deviance (3 <sup>rd</sup> grade)	-.15**	-.22**	-.12**	-.57**	-.51**	-.51**	.54**		
9. Deviance (5 <sup>th</sup> grade)	-.14**	-.19**	-.24**	-.48**	-.59**	-.59**	.51**	.70**	

Note. \*\* Correlations are statistically significant at  $p < 0.01$  (2 tailed)

*Hypothesis I: Structural Equation Model Tests of the Longitudinal Relations among Parenting, Self-Control, and Deviance*

The first hypothesis stated that there exist indirect effects of parenting at 54 months on early adolescent's deviance in 5<sup>th</sup> grade, as mediated by self-control in 3<sup>rd</sup> grade. Thus, a structural equation model (SEM) was used to test this prediction on latent constructs, each measured by two parcels. One advantage of AMOS is its ability to handle missing data using the full information maximum likelihood (FIML) procedure, which allows the model to be estimated from all observed data points. This approach is more efficient and less biased than more traditional list-wise deletion or mean-imputation methods (Wothke, 2000). Chi-square is commonly reported as the main evaluative fit index in SEM studies. A statically significant  $\chi^2$  indicates poor fit of the data to the specified model. Due to the known sensitivity of this statistic to sample size, a number of alternative fit indices have been developed to ascertain model fit. These include chi-square to degrees of freedom ratio (a ratio less than 3 indicates an acceptable fit, Hayduk, 1987; Loehlin, 1992), RMSEA (a score of .05 or less indicates an excellent fit, Brown & Cudeck, 1993; Loehlin, 1992), and the CFI (a score of .90 or better indicates a good fit, Bentler, 1993; Bentler & Dudgeon, 1996; Byrne, 1994). The results provided evidence that the data fit the specified model part of hypothesis I adequately:  $\chi^2 = 476.09$  (df = 116),  $\chi^2/df = 4.10$ , CFI = 0.96, and RMSEA = 0.052, though some of the indices were inadequate. Thus, potential model modifications were examined by inspecting modification indices provided by AMOS. Based on these indices, three error terms of the deviance constructs were allowed to correlate. Findings indicated improved model fit, namely  $\chi^2 = 335.34$  (df = 113),  $\chi^2/df = 2.97$ , CFI = 0.97, and RMSEA = 0.047.

Standardized parameter estimates from parenting at 54 months to self-control in 3<sup>rd</sup> grade ( $\beta = 0.16, p < .000$ ), parenting in 3<sup>rd</sup> grade to self-control in 5<sup>th</sup> grade ( $\beta = -0.12, p < .000$ ) were statistically significant and moderate in size, although the latter path was unexpectedly negative. In addition, the parameter estimate from self-control at 3<sup>rd</sup> grade to children's deviance at 5<sup>th</sup> grade was not significant (see Figure 5). Thus, the results indicated there was no indirect effect between parenting at 54 months and children's deviance in 5<sup>th</sup> grade; in other words, self-control did not mediate the relationship between parenting at 54 months and deviance in 5<sup>th</sup> grade.

Cohen (1978) describes how problems of multicollinearity in longitudinal models may result in a condition known as "bouncing betas". The direction of the beta term often flips from previously positive to negative relationships or vice versa, largely as a result of a high degree of redundancy in the model. In this case, each of the three study constructs was included three times in the model. Further examination of the patterns of associations among all manifest variable parcels part of the structural equation model revealed that each parcel was significantly associated with the other two main study constructs in the expected direction. Parenting parcels were positively associated with self-control parcels, while self-control parcels were negatively associated with deviance parcels. This provided some indication that the model and the unexpected observed parameter estimate may in fact be related to a high degree of model redundancy.

Although findings indicated no indirect effects between parenting at 54 months and deviance in 5<sup>th</sup> grade, through self-control in 3<sup>rd</sup> grade, in order to further examine this issue, additional posthoc models were tested that had some of the redundancy

removed. First, a model was tested that only included the three constructs of interest, namely T1 parenting, T2, self-control, and T3 deviance. Findings from this model provided evidence of a significant indirect effect, where the parameters from parenting at 54 months to self-control in 3<sup>rd</sup> grade ( $\beta = 0.40, p < .000$ ) as well as the parameter from 3<sup>rd</sup> grade self-control to 5<sup>th</sup> grade deviance were significant ( $\beta = -0.56, p < .000$ ; see Figure 5a). This suggested that model complexity greatly influenced findings. In an additional step, to further rule out the possibility of confounds due to not having removed T1 and T2 measures of the constructs (T1 self-control as well as T1 and T2 deviance), an additional model test was conducted, where the parcels were residualized by these T1 and T2 constructs. In addition, parcels were also residualized by age, sex, family structure and SES. The results provided evidence that the standardized parameter estimate from parenting at 54 months to self-control in 3<sup>rd</sup> grade remained statistically significant ( $\beta = 0.18; p < .01$ ), while the coefficient from 3<sup>rd</sup> grade self-control to 5<sup>th</sup> grade deviance was much more modest and only significant at the trend level ( $\beta = -0.05; p = .056$ ). Adding a direct paths from T1 parenting to T3 deviance did not change model fit or provide a significant effect ( $\chi^2 = 7.67$  (df = 6),  $\chi^2/df = 1.28$ , CFI = 0.99, and RMSEA = 0.014).

Figure 5.  
Longitudinal Relations among Parenting Processes, Self-Control, and Deviance

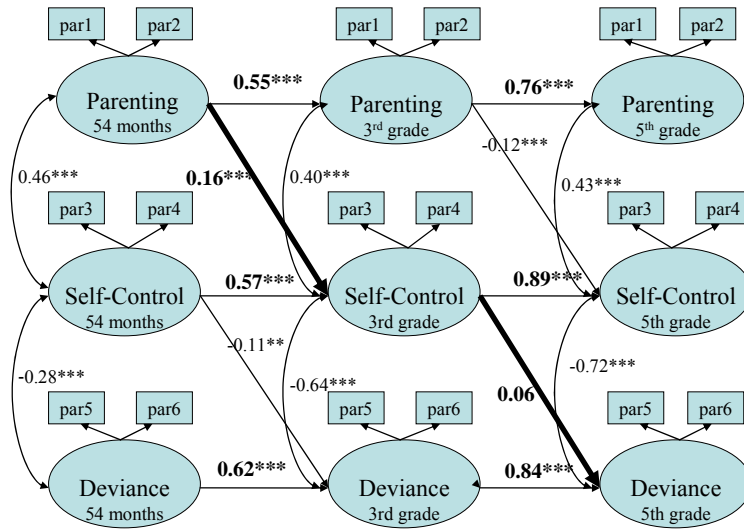
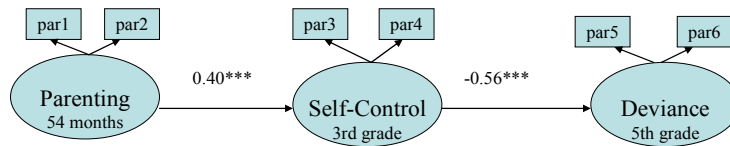


Figure 5a.  
A Simplified Model Test for Hypothesis I



## *Hypothesis II: Latent Growth Curve Model Tests of Children's Self-Control Trajectories*

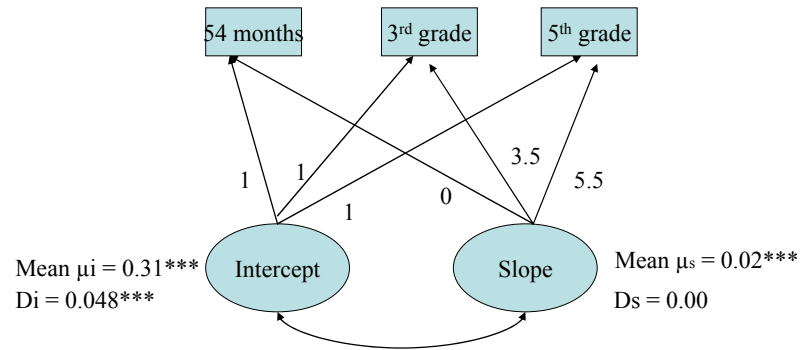
The second hypothesis focused on the trajectory of children's self-control; it was expected that self-control would positively change or increase (growth) over the three measurement points. Thus, two latent growth curve models were used to test self-control trajectories. Model A, the unconditional model, simply tested the change in self-control over time. Model B, a conditional model, included parenting at 54 months as a predictor of the developmental change over time.

There are two factors in the latent growth curve modeling. The first represents the intercept or initial status. This factor contains sample information about the mean and variance of the variable of interest. Each of the three manifest variables (self-control at 54 months, in 3<sup>rd</sup> grade, and in 5<sup>th</sup> grade) had factor loadings fixed to 1 on the intercept factor to constrain the intercept (or height of the reference curve; Duncan et al., 1999). The second latent factor, slope, represents the shape of the growth trajectory for self-control across three time points. The loadings of this factor are defined by the hypothesized shape of the trajectory over time (Curran & Muthén, 1999). Thus, path coefficients were fixed to represent linear, positive change (growth) over three time points -- 0, 3.5, and 5.5 (see Figure 6). This specification represented an equivalent change over time between children's level of self-control at each of the three time points. Results based on the total sample indicated that the data fit the model poorly  $\chi^2(3, n = 1,155) = 13.36, p < .001$ , CFI = 0.96, and RMSEA = 0.10, (C.I.: 0.08 - 0.13,  $p = 0.001$ ), although all parameters (i.e., mean and variance estimates) of the intercept and slope were statistically significant ( $p < .01$ ). Thus, slight modifications were needed to improve model fit. After adding a single correlation between the error terms of 3<sup>rd</sup> and 5<sup>th</sup> grade

self-control based on modification indices provided by AMOS using a data set with only complete cases, model fit improved:  $\chi^2 (1, n = 899) = 11.41, p < .001$ , CFI = 0.99, and RMSEA = 0.11.(CI = 0.06-0.17,  $p = 0.03$ ). Final analyses of this same model based on the total sample indicated that the data fit the model well, namely  $\chi^2 (1, n = 1,155) = 3.12, p = 0.08$ , CFI = 0.99, and RMSEA = 0.04(C.I.:0.00 -0.10,  $p = 0.47$ ). The model indicated a significant mean intercept factor ( $\mu_i = 0.31$ ) and a significant mean slope factor ( $\mu_s = 0.02$ ). Thus, the average developmental trajectory of self-control for the  $n = 1,155$  children began at 0.31 at the initial time assessment and increased linearly by 0.02 per year over the seven year period. The model also provided evidence of statistically significant variance in the intercept ( $D_i = 0.048$ ), but not the slope ( $D_s = 0.00$ ) factor. This indicated that there were significant differences across children in their starting values at 54 months, but perhaps more importantly, that there existed no differences in the positive rate of change over time among children. In addition, results also showed there was no significant correlation between the intercept and slope factors, thus the correlation between these two factors was dropped for conditional model tests.



Figure 6.  
Unconditional Latent Growth Curve Model for Self-Control



Model B: The conditional model tested whether parenting at 54 months predicted developmental changes in self-control over the three time points. Thus, a latent growth model with a single predictor (parenting at 54 months) was used to test this question. Because there was no variance in the slope factor in the unconditional model, the initial conditional model did not include the path from parenting at 54 months to the slope factor (see Figure 7). Results indicated the data fit the model fairly well:  $\chi^2(2, n = 1,155) = 4.31, p = 0.005, CFI = 0.99$  and  $RMSEA = 0.05$  (CI: 0.02-0.09;  $p=0.36$ ). Consistent with the unconditional model findings, results indicated that self-control increased at a rate of 0.02 per year over the seven year period. Parenting was a significant predictor for the initial status ( $\beta = 0.27, p < 0.001$ ). However, in this conditional model, the variance of the slope factor was statistically significant, and so the path to the slope factor was added back into the model for a final model test (see Figure 7a). Results indicated the data fit the model fairly well:  $\chi^2(2, n = 1,155) = 4.31, p = 0.005, CFI = 0.99$  and  $RMSEA = 0.05$

(CI: 0.02-0.09;  $p=0.36$ ). Again, results indicated that self-control increased at a rate of 0.02 per year over the seven year period, that parenting was a statistically significant predictor for the initial status ( $\beta = 0.29, p < 0.001$ ), and that parenting was not a significant predictor of the slope factor. In comparisons between the conditional model variance to the unconditional model variance in the intercept term, the addition of parenting to the self-control trajectory reduced the unexplained variance in initial status by approximately 12.5% ( $0.048-0.042/0.048 = 12.5\%$ ).

Figure 7.  
Latent Growth Curve Model for Self-Control with Predictor  
(Unstandardized Growth Coefficients)

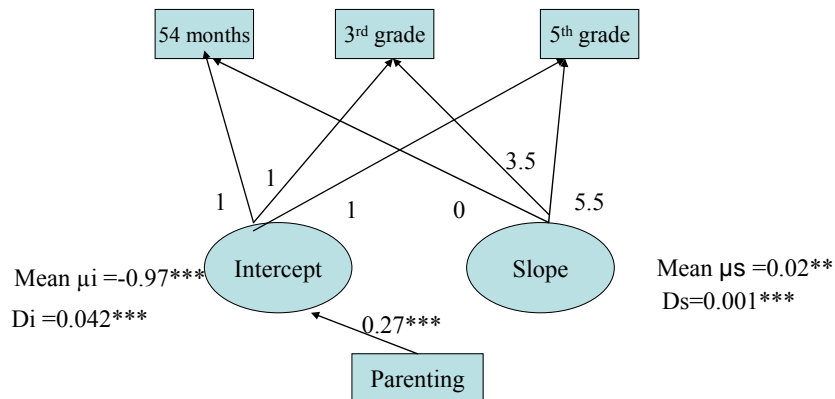
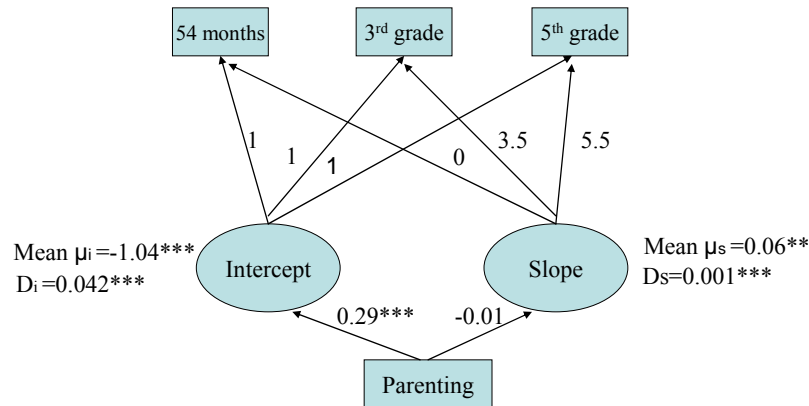


Figure 7a.  
 Latent Growth Curve Model for Self-Control with Predictor  
 (Unstandardized Growth Coefficients)

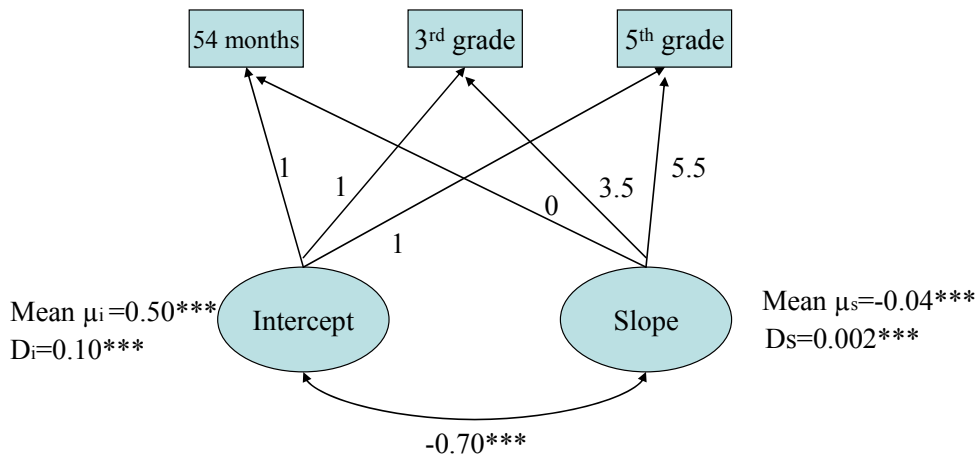


*Hypothesis III: Latent Growth Curve Model Tests of Children's Deviance Trajectory*

The third hypothesis expected that parallel to increases in self-control over time, deviance would decrease over time. Again, a two part approach was used to test both an unconditional (Model A) and a conditional (Model B) growth model of the deviance trajectory. Model A: An unconditional model for children's deviance behaviors was examined. Based on the total sample, findings indicated that data fit the model poorly, namely  $\chi^2(3, n = 1,155) = 13.22, p = 0.00, CFI = 0.96,$  and  $RMSEA = 0.16$  (CI: 0.07-0.13,  $p = 0.001$ ). Based on the addition of a single modification from a model test that included a sample with no missing data, namely the correlation between the errors of 54 month and 3rd grade self-control, model fit improved substantially:  $\chi^2(2, n = 899) = 1.43, p = 0.23, CFI = 0.99,$  and  $RMSEA = 0.02$  (CI: 0.00-0.07,  $p = 0.76$ ). Thus, based on the total sample, findings indicated that the data fit this model quite well, namely  $\chi^2(2, n$

$=1,155) = 1.68, p = 0.18, CFI = 0.99, \text{ and } RMSEA = 0.02 (CI = 0.00-0.06, p=0.79)$ . The model provided evidence of a statistically significant intercept ( $\mu_i = 0.50$ ) and slope factors ( $\mu_s = -0.04$ ). The mean developmental trajectory of deviance decreased linearly by 0.04 over the seven year period. The model also provides evidence of significant variance components in both the intercept factor ( $D_i = 0.10$ ) and the slope factor ( $D_s = 0.002$ ). This indicated that there were significant individual differences in starting value and rates of change over time. A strong negative correlation ( $r = -0.70$ ) was found between intercept and slope, though it reached statistical significance which means that the level of children's deviant behavior at 54 months was negatively related to changes in deviant behaviors over time.

Figure 8.  
Unconditional Latent Growth Curve Model for Deviance  
(Unstandardized Growth Coefficients)



Model B: To test a conditional model, where children's level of self-control at 54 months predicted developmental trajectories of deviance. Findings provided evidence that the data fit the model fairly well, namely  $\chi^2(2, n = 1,155) = 1.91, p = 0.15$ , CFI = 0.99, and RMSEA = 0.03 (CI: 0.00 to 0.07,  $p = 0.75$ ). Each parameter estimate (i.e., means and variance estimates) of the intercept and slope factors were statistically significant ( $p < 0.001$ ). Self-control also significantly predicted both intercept and slope factors. The results provided evidence that initial levels of deviance were 1.19 on average and that deviance decreased at rate of 0.08 per year over seven years. The effects by self-control were  $\beta = -0.53$  ( $p < 0.001$ ) on initial status in deviance and  $\beta = 0.03$  ( $p < 0.001$ ) on the rate of change in deviance. Again, to illustrate the findings from the latent growth models, Figure 11 includes the prototypical growth plot of deviance over a seven year period, based on including self-control as a predictor. Three deviance trajectories are shown, namely at  $-1$  SD, at the mean, and at  $+1$  SD. In addition, in a comparison of the conditional model intercept variance to the unconditional model variance, findings indicated that the addition of self-control as a predictor reduced the unexplained variance by 50% ( $(0.1 - 0.05) / 0.1 = 50\%$ ). In addition, a negative correlation ( $r = -0.15$ ) was found between intercept and slope, which also means that the level of children's deviant behavior at 54 months was negatively related to changes in deviant behaviors over time.

Figure 9.  
 Latent Growth Curve Model for Deviance with Predictor  
 (Unstandardized Growth Coefficients)

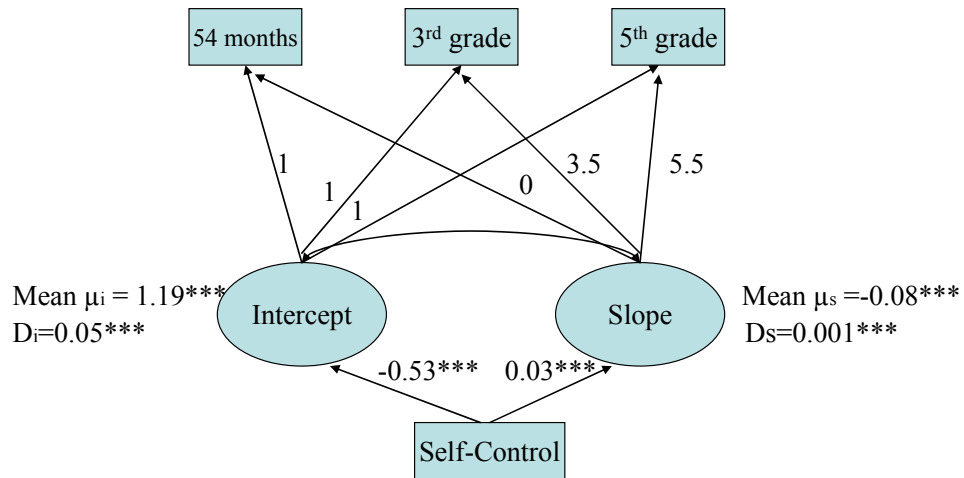
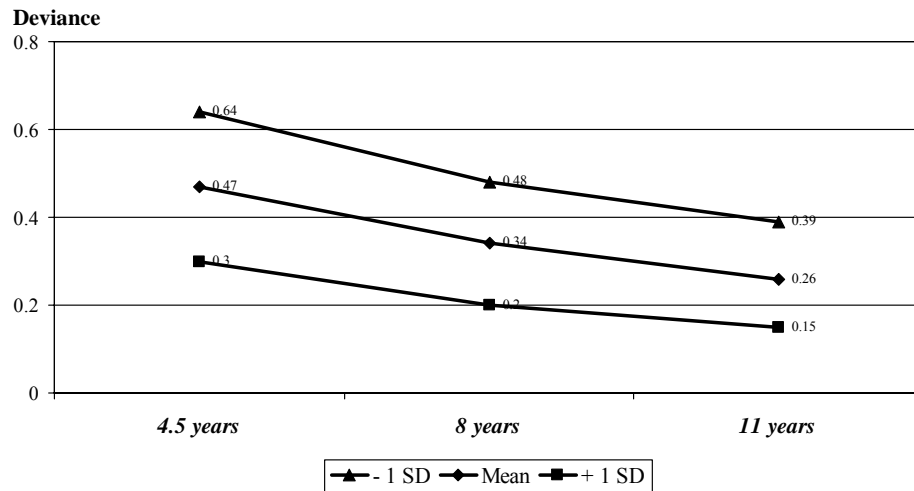


Figure 10.  
Prototypical Deviance Growth Plot by Levels of Self-Control



### *Posthoc Analyses*

In order to rule out possible effects due to potential confounds, such as demographic variables, models were also tested with four control variables (sex, age, family structure, and SES), where their effects were partialled out by entering them into each model. Findings provide evidence that none of these variables significantly predicted intercept or slope factors in the trajectory analyses.

## V. DISCUSSION

The purpose of current study was to examine theoretical propositions by Self-Control Theory. More specifically, the current study examined three theoretical propositions. First, Gottfredson and Hirschi (1990) suggest that the major cause of low self-control is a lack of effective child rearing or parenting. Second, they suggest that self-control is established during the first decade of life, by the age of eight or ten, and that it becomes relatively stable after that. Third, they suggest by implication that deviance should decrease during this age period, largely paralleling the development and establishment of self-control. Latent variable models were used to test these propositions with the nationally representative NICHD sample of children between the ages of 4.5 to 11 years over a seven year period. Key findings from the study provide evidence that parenting effects at 54 months were not mediated through self-control in 3<sup>rd</sup> grade on children's deviance in 5<sup>th</sup> grade. However, follow-up analyses on simplified models did provide evidence of indirect parenting effects. Secondly, as hypothesized, children's self-control positively changed over the seven year period; finally, the study also found that children's deviance declined over the same period. Conditional growth model tests also provided evidence that parenting at 54 months predicted children's positive growth in self-control over time and that self-control predicted children's negative deviance trajectory over time. The discussion focuses on how the findings from current study contribute to our understanding of child and early adolescent developmental self-control



and deviance trajectories, and how parenting influences these developments. Additionally, limitations and implications of the current study are discussed.

*Hypothesis I: The Longitudinal Relations among Parenting, Self-Control, and Deviance*

The purpose of first hypothesis was to examine the longitudinal relationships among parenting, self-control, and deviance. Based on both theoretical considerations and empirical evidence, it was expected that indirect effects would be found for parenting measures on deviance, through self-control. Findings based on the simplex model indicated that there were no indirect effects from parenting at 54 months on children's deviance in 5<sup>th</sup> grade, through children's self-control in 3<sup>rd</sup> grade, though some evidence for indirect effects were found once redundancy of the model was removed. Although indirect effects were hypothesized, largely based on previous empirical evidence, the theory does not specify whether effects would be direct or indirect. In fact, many studies to date have found some evidence of indirect effects by parenting on deviance, through self-control (e.g., Cochran et al., 1998; Hay, 2001; Hope et al., 2003; Perrone et al., 2004; Polakowski, 1994; Pratt et al., 2004; Vazsonyi & Belliston, 2007), although an almost equal number has also found no such evidence or only partial mediation (e.g., Benda, 2002, Gibbs et al., 2003; Hay, 2001; Perrone et al., 2004; Unnever et al., 2003). It is important to note that none of the previous studies that have sought to test predictions by Self-Control Theory have used samples of young children which in effect could document developmental changes during the first decade of life. In addition, most studies testing the theory have used convenience samples of college students or of adolescents

and have focused on issues of construct stability over time, rather than on developmental changes (growth or decline) during this period.

Examples from the developmental literature have also largely focused in effect on the stability of rank ordering over time. For example, Brody and Ge (2001) used a longitudinal data with adolescents between the ages of 12 and 14 years to examine the effects of parenting and youth self-regulation on adolescent psychological functioning and alcohol use. They found that there were no direct links between parenting practices and alcohol use. Similarly, Eisenberg et al. (2005) found that children's effortful control or regulation mediated the relations between parental warmth and positive expressivity or children's externalizing problems. They only found partial support for mediation, because the results also indicated that not all the paths in their model were statistically significant. In fact, much like in the current study, and based on the same model complexity, they found that Time 2 effortful control did not predict Time 3 externalizing behaviors – likely also a methods artifact.

Two very recent studies have direct implications for the current effort, in that they also focused on developmental changes or trajectories of children and youth, namely studies by Hay and Forrest (2006) and Zhou et al. (2007). Hay and Forrest (2006) focused on the parenting and self-control link, while Zhou et al.'s (2007) study focused on the effortful control and externalizing problem behavior. Hay and Forrest (2006) used the NLSY to examine changes in self-control over time based on a sample of children and youth between the ages of 7 and 15 years. They found that parental socialization continued to affect children's self-control during adolescence, more specifically, children at age 11 to age 15, those with parents decreased their parental socialization quality

displayed a decreasing self-control, those with positive parental socialization showed an increasing self-control. Zhou et al. (2007) studied a similar question based on a sample of children between the ages of 5 and 10 years. They found that children with high and stable effortful control trajectories tended to exhibit low and stable trajectories of externalizing problems. However, these two recent studies only focused on parts of the longitudinal links among parenting, self-control, and deviance. Thus, one of the unique contributions of the current study included an extension of work that focused on the relationships among these three variables.

*Hypothesis II: Children's Self-Control Trajectory*

Second, the current study examined changes in self-control over time. It was expected that children's self-control trajectory would indicate positive growth or change over seven year period (unconditional growth model). In addition, it was also expected that parenting at 54 months would predict the developmental changes in children's self-control over the seven year period (conditional growth model). The findings provided evidence that children's self-control increased between ages 4.5 to age 11 years. They also indicated that there existed significant individual differences at the starting point (initial status), but there existed no significant individual differences in the rate of change over time. In addition, the conditional growth model indicated that parenting at 54 months was a significant predictor of the initial status in self-control, but not of the slope factor (the rate of change of self-control). In a comparison of the variance in the intercept factors in the unconditional and conditional growth models, the unexplained variance was reduced by about 12.5%. This provided evidence that parenting is important for the development of children's self-control prior to the age of 4.5. In the end, findings

provided support for hypothesis II, except for the finding that parenting did not predict the self-control slope.

In terms of how these findings fit with previous work, only two studies appear to have addressed similar issues, one based on the same theoretical predictions (Hay & Forrest, 2006) and the second based on previous empirical work (Zhou et al., 2007). More specifically, Hay and Forrest (2006) found that 84 percent of respondents experienced what they termed relative stability which means that their relative position in the self-control distribution remained largely unchanged in their sample of 7 to 15 year old children and youth. Perhaps more relevant for the current findings, they used a person-centered approach and also found that parenting continued to affect children's self-control during adolescence. On the other hand, Zhou et al. (2007) examined the developmental trajectories of attention focusing, attentional and behavioral persistence, which are two indices of effortful control. Their results indicated that the trajectory of attention focusing between the ages of 5 to 10 years was stable, while attentional and behavioral persistence showed mean-level changes, there were three trajectory clusters for persistence, namely high and stable level of persistence, a moderate and stable persistence, and a cluster with initially low but increase dramatically in persistence trajectories from age 5 to 10 years. It is important to reiterate that other previous work has indicated missing support for the theory, largely due to how the "stability issue" was conceptualized and tested in the studies, namely a variable centered approach that focused on the stability of rank ordering over time (e.g., Winfree et al., 2006; Mitchell & MacKenzie, 2006). Again parallel to the findings in the conditional growth mode, Hay and Forrest (2006) used a person-centered approach and also found that parenting

continued to affect children's self-control during adolescence. In related work from the developmental literature, Brody and Ge (2001) as well as Eisenberg et al. (2003) also found consistent evidence that parenting processes affected children's self-control or self-regulation over time, though again these studies did not employ person centered strategies, but variable centered ones.

*Hypothesis III: Children's Deviance Trajectory*

The final hypothesis focused on parallel questions from hypothesis II, but this time on potential developmental changes in deviance over the seven year period. Consistent with the hypothesized positive growth self-control over time, it was expected that deviance would decline during the same seven year period. Though this is not specifically predicted by Self-Control Theory, given the assumptions related to how self-control develops during the first decade of life and its expected growth based on socialization effects, this prediction in effect parallels self-control change predictions. Thus, again an unconditional and a conditional growth model were tested, where consistent with theory, self-control predicted the hypothesized declines of deviance over the seven year period.

Consistent with expectations and theoretical predictions, both conditional and unconditional growth curve models yielded results which indicated that children's deviance trajectories decreased between the ages of 4.5 to 11 years (54 months to 5<sup>th</sup> grade). In addition, self-control was found to be an important predictor in children's deviance trajectories. In addition, in comparisons of the unexplained variance in the intercept factor in the unconditional and conditional models, findings provided evidence that self-control reduced the unexplained variance by 50%. The implication of this is that

much of the observed differences in deviance at 54 months are attributable to differences in self-control preceding this age.

These findings are consistent with the limited previous work that has examined the developmental changes in deviance during childhood and early adolescence. Previous studies that also used large national longitudinal samples (e.g., NICHD Early Child Care Research Network, 2004) also found that most children followed stable and declining physical aggression or problem behaviors trajectories between toddlerhood and middle childhood. Similarly, Zhou et al. (2007) found that 18% of their sample of children has displaying high levels of externalizing behaviors followed slightly declining trajectories based on mother reports. They also found children with high and stable attention effortful control tended to display stable low externalizing problems across ages 5 to age 10. In addition, they also found children with low and less stable trajectories of attention focusing or persistence displayed moderate to high and relatively stable levels of externalizing problems; some children also exhibited low externalizing behaviors during childhood but subsequently increasing rates of externalizing behaviors through the elementary school years.

Other previous studies (e.g., The NICHD Early Child Care Research Network, 2004; Schaeffer et al., 2003; Zhou et al., 2007) have also found more diverse patterns of deviance trajectories, such as low stable, moderate or high increasing trajectories during childhood. Part of the reason for these more nuanced differences is the fact that this work, as well as the work by Zhou et al. (2007) focused on what amounts to a typological approach in studying developmental patterns of change. In the current study, the focus was on the total group of children, based on theory, theoretical predictions, and specific

hypotheses, and thus the findings provide a glimpse of the average change over time as opposed to changes in specific groups based on empirical or conceptual classification. It would be interesting to examine the current questions using a typological approach and to examine the previously identified heterogeneity of developmental changes in deviance over the seven year period, and to examine how closely the obtained findings mapped onto previous work. It is interesting to note that children's self-control and deviance trajectories did not appear to be affected by children's sex, age, family structure or family SES. Eisenberg et al. (2005) also failed to find meaningful effects by the same background variables on the relationships among parenting, effortful control, and externalizing problems. On the other hand, other studies (e.g., Zhou et al., 2007) did find sex differences in effortful control and externalizing problem behavior trajectories.

In conclusion, the current study provides important new evidence on developmental influences by parenting on the development of self-control and its effects on deviance. It also tested the particular developmental changes in both self-control and deviance. First, findings suggest that parenting was a consistent predictor of children's self-control, and the relationships among parenting, children's self-control, and deviance were in the expected directions, though an indirect effect from parenting at 54 months to children's deviance in 5<sup>th</sup> grade through children self-control in 3<sup>rd</sup> grade was not found, however posthoc models provide evidence that there exist significant indirect effect. Second, the results indicated children's self-control trajectory increased over the seven year period and that parenting at 54 months explained some modest variability (12.5%) in the initial status. These findings also provide modest support to theoretical proposition about self-control development. Finally, the current investigation provides evidence that children's

deviance trajectories decreased over time, and further, that self-control was an important predictor of these observed developmental changes in deviance, but also of how it influenced the development of deviance prior to age four (intercept findings). Sroufe (1990) has emphasized that the development of children's personality occurs in early childhood, presumably prior to the age of 4 or 5.

### *Limitations*

Like so many other empirical studies, the current study also has its limitations. These include the measurement of parenting, which did not map onto Gottfredson and Hirschi's (1990) multidimensional view of the three required elements for effective parenting – supervision, recognizing deviance when it occurs, and consistently punishing deviance. Of these three, the measure used in current study only captured supervision, however, recognize deviance and punish deviance were not measured in the current study. Second, this study examined the relationships among parenting, self-control, and deviance between the ages of 4.5 to 11 years only. Thus, an important question to address in the future research is the nature of these developmental trajectories as children move further into adolescence. Given some of the findings in the current study, it seems important to track children before they reach 4.5 years in age in order to develop a more complete understanding about the extent to which socialization efforts shape children's development and their levels of self-control, but also whether socialization efforts largely cease to exert effects past the first decade of life as hypothesized by Self-Control Theory. Third, the current study only included data reported by mothers; though perhaps not entirely feasible, a design that takes advantage of multiple-informants would be important improvements in future work. Finally, although these data are based on a national effort,



it used local community samples of families, and thus the demographic characteristics of the sample were simply similar to those of the families in each of those areas of the country. Most participants were White and from lower to middle class. Furthermore, most families consisted of two biological, married parents, and thus, children resided in “adverse” circumstances. Therefore, the findings from this work may simply not generalize to families in more adverse circumstances or to other ethnic groups, or to family situations where fathers do not reside with the children or are not married to mothers. This is an important limitation because there is little work in the literature regarding the effects of marital and family life in minority families beyond studies of mother-child interactions. Future work needs to address these gaps. In addition, although the current study did not find any gender differences in the development of self-control and deviance, earlier longitudinal work by Block and Block (1980) on ego-control and ego-resiliency provided evidence of developmental differences in male versus female children from preschool to age 7. Thus, future work will need to further investigate this area, specifically related to potential gender differences, in other samples.

#### *Implications of current study*

The current study has several important implications for the Self-Control Theory and prevention research which focuses on decreasing children’s deviant behaviors. First, the findings from the current study provide important empirical tests of Self-Control Theory. Findings suggest that self-control is an important probabilistic construct in understanding deviance and deviance etiology, though they also emphasize that much if the variance remains unexplained, both in the dependent variables as well as in how both self-control and deviance develop or change over time. The findings also suggest that

early parenting matters for the development of children's self-control. Third, these results do offer some modest guidance to juvenile corrections and intervention programs, for instance, by implicating ineffective parenting as an important etiological risk factor (e.g., Keiley, 2007). In general, key contributions by the current focused on the longitudinal relationships among parenting, self-control, and deviance, but also the developmental trajectories of both self-control and deviance over a seven year period during the first decade of life. To date, few empirical studies have examined these issues on this age group, despite the fact that some recent work previously discussed addressed parts of these questions using similar samples. The current study examined children between the ages of 4.5 and 11 years and provided consistent support to theoretical propositions by Self-Control Theory. Findings provide evidence that parenting does predict self-control, that self-control continues to change during childhood, and that in parallel, a measure of deviance decreases. Findings also showed that self-control is an important predictor of deviance trajectories.

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## APPENDICES

## Appendix A

### Child Behavior Checklist - Parent Report Form

Below is a list of items that describe your child. For each item that describes the child now or within the past 2 months, please circle the 2 if the item is very true or often true of the pupil. If the item is not true of the child, circle the 0. Please answer all items as well as you can, even if some do not seem to apply to this child.

1. Acts too young for his/her age or something bad
2. Allergy (describe): \_\_\_\_\_
3. *Argues a lot*
4. Asthma
5. Behaves like opposite sex
6. Bowel movements outside toilet
7. Bragging, boasting
8. Can't concentrate, can't pay that aren't there
9. Can't get his/her mind off certain thoughts obsessions (describe): \_\_\_\_\_
10. Can't sit still, restless, or hyperactive
11. Clings to adults or too dependent
12. Complains of loneliness
13. Confused or seems to be in a fog
14. Cries a lot
15. Cruel to animals
16. *Cruelty, bullying, or meanness to others*
17. Daydreams or gets lost in his/her thoughts
18. Deliberately harms self or attempts suicide
19. *Demands a lot of attention*
20. Destroys his/her own things
21. Destroys things belonging to his/her family or others
22. *Disobedient at home*
23. Disobedient at school
24. Doesn't eat well
25. Doesn't get along with other kids
26. *Doesn't seem to feel guilty after misbehaving*
27. Easily jealous
28. Eats or drinks things that are not food-don't include sweets (describe): \_\_\_\_\_
29. Fears certain animals, situations, or places other than school (describe): \_\_\_\_\_
30. Fears going to school
31. Fears he/she might think

32. Feels he /she has to be perfect
33. Feels or complains that no one loves him/her
34. Feels others are out to get him/her
35. Feels worthless or inferior
36. Gets hurt a lot, accidentprone
37. Gets in many fights
38. Gets teased a lot
39. Hangs around with others who get in trouble
40. Can't get his/her mind off certain thoughts
41. Impulsive or acts without thinking
42. Would rather be alone than with others
43. *Lying or cheating*
44. Bites fingernails
45. Nervous, high-strung, or tense
46. Nervous movements or twitching
47. Nightmares
48. Not liked by other kids
49. Constipated, doesn't move bowels
50. Too fearful or anxious
51. Feels dizzy
52. Feels too guilty
53. Overeating
54. Overtired
55. Overweight
56. Physical problems without know medical causes: a. aches or pains; b. headaches; c. nausea, fee sick; d. problem with eyes; e. rashes or other skin; f. stomachaches or cramps; g. vomiting; h. others
57. Physically attacks people
58. Picks nose, skin, or other parts of body (describe): \_\_\_\_\_
59. Plays with own sex parts in public feelings
60. Plays with own sex parts too much
61. Poor school work
62. Poorly coordinated or clumsy
63. Prefers being with older kids
64. Prefers being with younger kids
65. Refuses to talk
66. Repeats certain acts over and over; compulsions (describe): \_\_\_\_\_
67. Runs away from home
68. Screams a lot
69. Secretive, keeps things to self
70. Sees things that aren't there (describe): \_\_\_\_\_
71. Self-conscious or easily embarrassed
72. Sets fires
73. Sexual problems (describe): \_\_\_\_\_
74. Showing off or clowning
75. Shy or timid

76. Sleeps less than most kids
77. Sleeps more than most kids during day and/or night (describe): \_\_\_\_\_
78. Smears or plays with bowel movements
79. Speech problem (describe): \_\_\_\_\_
80. Stares blankly
81. Steals at home
82. Steals outside the home others
83. Stores up things he/she doesn't need (describe): \_\_\_\_\_
84. Strange behavior
85. Strange ideas
86. *Stubborn, sullen, or irritable*
87. Sudden change
88. Sulks a lot
89. Suspicious
90. Swearing or obscene.
91. Talks about killing self
92. Talks or walks in sleep
93. Talks too much.
94. Teases a lot
95. *Temper tantrums or hot*
96. Thinks about sex too
97. Threatens people
98. Thumb-sucking
99. Too concerned with
100. Trouble sleeping
101. Truancy, skips
102. Underactive, slow moving, or lacks energy
103. Unhappy, sad, or depressed
104. Unusually loud
105. Uses alcohol or drugs
106. Vandalism
107. Wets self during the day
108. Wets the bed
109. Whining
110. Wishes to be opposite
111. Withdrawn, doesn't get
112. Worries
113. Please write in any problems your child that was not listed above:

## Reference

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## Appendix B

### Social Skills Rating System (SSRS) - Parent form

If your child never does this behavior, circle the 0. If your child sometimes does this behavior, circle the 1. If your child very often does this behavior, circle the 2.

1. Uses free time at home in an acceptable way.
2. Keeps room clean and neat without being reminded.
3. *Speaks in an appropriate tone of voice at home.*
4. Joins group activities without being told to.
5. Introduces herself or himself to new people without being told.
6. *Responds appropriately when hit or pushed by other children.*
7. Asks sales clerks for information or assistance.
8. Attends to speakers at meetings such as in church or youth group.
9. *Politely refuses unreasonable request from others.*
10. Invites others to your home.
11. Congratulates family members on accomplishments.
12. Make friends easily.
13. Shows interest in a variety of things.
14. *Avoids situations that are likely to result in trouble.*
15. Puts away toys or other household property.
16. Volunteers to help family members with tasks.
17. *Receives criticism well.*
18. Answers the phone appropriately.
19. Helps you with household tasks without being asked.
20. Appropriately questions household rules that may be unfair.
21. Attempts household tasks before asking for your help.
22. *Controls temper when arguing with other children.*
23. Is liked by others.
24. Starts conversations rather than waiting for others to talk first.
25. *Ends disagreements with you calmly.*
26. *Controls temper in conflict situations with you.*
27. Give compliments to friends or other children in the family.
28. Completes household tasks within a reasonable time.
29. Asks permission before using another family member's property.
30. Is self-confident in social situations such as parties or group outings.
31. *Avoids situations that are likely to result in trouble.*
32. *Responds appropriately to teasing from friends or relatives of his or her own age.*
33. Uses time appropriately while waiting for your help with homework or some other task.
34. Accepts friends' ideas for playing.

35. Easily changes from one activity to another.
36. *Cooperates with family members without being asked to do so.*
37. Acknowledges compliments or praise from friends.
38. Reports accidents to appropriate persons.

#### Reference

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## Appendix C

### Child-Parent Relationship Scale

Responses: A = definitely does not apply, B = not really, C = neutral, not sure; D = applies sometimes; E = definitely applies.

1. *I share an affectionate, warm relationship with my child*
2. My child and I always seem to be struggling with each other.
3. *If upset, my child will seek comfort from me*
4. *My child is uncomfortable with physical affection or touch from me*
5. *My child values his/her relationship with me*
6. *When I praise my child, my child beams with pride.*
7. *My child spontaneously shares personal information.*
8. My child easily becomes angry at me.
9. *It is easy to be in tune with what my child is feeling.*
10. My child remains angry or is resistant after being disciplined.
11. Dealing with my child drains my energy.
12. When my child wakes up in a bad mood, I know we're in for a long and difficult day.
13. My child's feelings toward me can be unpredictable or can change suddenly.
14. My child is sneaky or manipulative with me.
15. *My child openly shares his/her feelings and experiences with me.*

### Reference

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Note: The italicized items were used in the current study.



Appendix D

Auburn University Institutional Review Board Approval and Renewal Forms

**Auburn University**  
Auburn University, Alabama 36849



Office of Human Subjects Research  
307 Samford Hall

Telephone: 334-844-5966  
Fax: 334-844-4391  
hsubject@auburn.edu

February 13, 2006

MEMORANDUM TO: Alexander Vazsonyi  
Human Development and Family Studies

PROTOCOL TITLE: "Family Processes, Low Self-Control and Deviance: A Longitudinal Test of the General Theory of Crime"

IRB File: #06-023 EX 0602

APPROVAL DATE: February 7, 2006  
EXPIRATION DATE: February 6, 2007


The referenced protocol was approved "Exempt" from further review under 45 CFR 46.101 (b)(4) by IRB procedure on February 7, 2006. You should retain this letter in your files, along with a copy of the revised protocol and other pertinent information concerning your study. If you should anticipate a change in any of the procedures authorized in this protocol, you must request and receive IRB approval prior to implementation of any revision. Please reference the above IRB File in any correspondence regarding this project.

If you will be unable to file a Final Report on your project before February 6, 2007, you must submit a request for an extension of approval to the IRB no later than January 15, 2007. If your IRB authorization expires and/or you have not received written notice that a request for an extension has been approved prior to February 6, 2007, you must suspend the project immediately and contact the Office of Human Subjects Research for assistance.

A Final Report will be required to close your IRB project file.

If you have any questions concerning this Board action, please contact the Office of Human Subjects Research at 844-5966.

Sincerely,



Niki L. Johnson, JD, MBA, Director  
Office of Human Subjects Research  
Research Compliance Auburn University

c: Marilyn Bradbard

# Auburn University

Auburn University, Alabama 36849



Office of Human Subjects Research  
307 Samford Hall

Telephone: 334-844-5966  
Fax: 334-844-4391  
hsubjec@auburn.edu

December 18, 2006

MEMORANDUM TO: Dr. Alexander Vazsonyi  
HDFS

TITLE: "Family Processes, Low Self-Control and Deviance: A longitudinal test of the General Theory of Crime"

IRB AUTHORIZATION NO.: 06-023 EX 0602

IRB APPROVAL DATE: February 7, 2006  
RENEWAL DATE: December 16, 2006  
IRB EXPIRATION DATE: February 6, 2008

The renewal for the above referenced protocol was approved by IRB Procedure on December 16, 2006. The protocol will continue the designation "Exempt" under 45 CFR 46.101 (b)(4). You should report to the IRB any proposed changes in the protocol or procedures and any unanticipated problems involving risk to subjects or others. Please reference the above authorization number in any future correspondence regarding this project.

If you will be unable to file a Final Report on your project before February 6, 2008, you must submit a request for an extension of approval to the IRB no later than January 20, 2007. If your IRB authorization expires and/or you have not received written notice that a request for an extension has been approved prior to February 6, 2008, you must suspend the project immediately and contact the Office of Human Subjects Research for assistance.

A Final Report will be required to close your IRB project file.

If you have any questions concerning this Board action, please contact the Office of Human Subjects Research at 844-5966.

Sincerely,

Niki L. Johnson, JD, MBA, Director  
Office of Human Subjects Research  
Research Compliance Auburn University

cc: Dr. Leanne Lamke