

AGE-GRADED THEORY OF SOCIAL CONTROL: IMPLICATIONS
FOR THE SCHOOL-TO-PRISON PIPELINE

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ABSTRACT

School exclusion during adolescence, namely suspension, expulsion, and drop out, has a number of immediate and long-term consequences for youth. Among these consequences are an increased likelihood of engaging in delinquency and risk of incarceration. Recent research has coined this process the “school-to-prison pipeline,” and while substantial evidence portraying the negative effects of school exclusion exists, much of this evidence overlooks important antecedents to exclusionary school punishment. Employing a developmental life course (DLC) framework, this dissertation applies a social control model across adolescence to evaluate how youths’ bonds to school influence school misbehavior and delinquency and contribute to suspension, expulsion, and drop out. It also expands on prior research that considers the consequences of school exclusion by evaluating this experience’s effects on employment, postsecondary education, and romantic relationships as youth transition into young adulthood, and considers how these age-graded sources of social control contribute to continued offending and incarceration. Importantly, using a diverse sample of 1,216 first-time juvenile offenders, this dissertation explores how these processes differ across race/ethnicity through multi-group structural equation modeling.

Findings reveal partial support for the application of a social control model to the school-to-prison pipeline. Bonds formed to mothers in early adolescence are shown to positively influence the formation of a strong bond to school. Strong school bonds, in turn, reduce the likelihood that youth engage in school misbehavior and delinquency. Bonds to school are indirectly related to school exclusion and dropout through school misbehavior and delinquency. These negative events—school exclusion and dropout—

increase the likelihood that youth offend in young adulthood, with dropout also increasing the risk of incarceration. While support for prosocial bonds in young adulthood acting as turning points is limited, individuals who are employed are less likely to experience incarceration. The multigroup model indicates that these relationships do not vary across race.

Examining the school-to-prison pipeline under a unified lens allows for multiple intervention points. Implications for policy are discussed at each stage of the model and include targeting youths' relationships with parents early in adolescence, engaging youth in school to promote strong bonds and discourage school misbehavior and delinquency, and implementing strategies to reengage youth who are excluded from or drop out of school.

For Grandmother.

Thanks for waiting.

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TABLE OF CONTENTS

| | Page |
|--|------|
| ABSTRACT..... | ii |
| DEDICATION..... | iv |
| ACKNOWLEDGEMENTS..... | v |
| LIST OF FIGURES..... | xi |
| LIST OF TABLES..... | xii |
| CHAPTER 1 - INTRODUCTION..... | 1 |
| CHAPTER 2 - LITERATURE REVIEW..... | 7 |
| School Exclusion and Dropout..... | 7 |
| Sources of School Exclusion and Dropout..... | 8 |
| Effects of School Exclusion and Dropout..... | 10 |
| Mediators to School Exclusion and Dropout..... | 13 |
| Theoretical Framework..... | 16 |
| Racial Differences in School Bonds..... | 18 |
| School Bonds and Delinquency..... | 20 |
| School Bonds and School Misbehavior..... | 22 |
| School Bonds and Problem Behavior: Mediation, Moderation, and Reciprocal Effects..... | 24 |
| Implications of School Bonds for Young Adult Bonds to Society..... | 26 |
| Gaps in Knowledge and the Present Study..... | 31 |
| CHAPTER 3 - THE CURRENT STUDY..... | 35 |
| Research Questions and Hypotheses..... | 35 |
| Data..... | 41 |
| Measures..... | 43 |

| | |
|---|-----|
| Endogenous Variables | 44 |
| Exogenous Variables | 50 |
| Analytic Strategy | 53 |
| Measurement Models | 54 |
| Hybrid SEM | 56 |
| Multigroup Model | 58 |
| Missing Data | 59 |
| CHAPTER 4 – RESULTS | 61 |
| Descriptive Statistics | 62 |
| Measurement Models | 66 |
| Hybrid SEM | 71 |
| Multigroup Hybrid SEM | 79 |
| Summary of Findings | 84 |
| CHAPTER 5 – DISCUSSION AND IMPLICATIONS | 86 |
| Theoretical Implications | 88 |
| Policy Implications | 93 |
| Limitations and Directions for Future Research | 98 |
| Conclusion | 103 |
| REFERENCES CITED | 104 |
| APPENDIX A. STANDARDIZED DIRECT EFFECTS OF EXOGENOUS VARIABLES ON ENDOGENOUS VARIABLES | 134 |
| APPENDIX B. DECOMPOSITION OF EFFECTS | 137 |
| APPENDIX C. MULTIGROUP MODEL CORRELATED PATH CONSTRAINTS .. | 140 |

APPENDIX D. SUPPLEMENTAL ANALYSES 141

LIST OF FIGURES

| | |
|--|----|
| Figure 1. Conceptual Model | 38 |
| Figure 2. Higher-Order Latent Factor of School Bond..... | 54 |
| Figure 3. Significant Paths of the Hybrid SEM Model..... | 75 |

LIST OF TABLES

| | |
|--|-----|
| Table 1. Study Variables and Measurement Waves..... | 36 |
| Table 2. Descriptive Statistics: Endogenous Variables..... | 63 |
| Table 3. Descriptive Statistics: Exogenous Variables..... | 65 |
| Table 4. Standardized Factor Loadings on Latent Constructs | 67 |
| Table 5. Model Fit Statistics for Latent Constructs | 68 |
| Table 6. Unstandardized and Standardized Direct Effects of Exogenous Variables on School Bond..... | 73 |
| Table 7. Unstandardized and Standardized Direct Effects of Endogenous Variables | 76 |
| Table 8. Decomposing the Effects: Total Indirect and Specific Indirect Effects of School Bond on Postsecondary Education, Offending, and Incarceration | 78 |
| Table 9. Multigroup Hybrid SEM Path Constraints..... | 82 |
| Table 10. Multigroup Model: Unstandardized Direct Effects on Endogenous Variables | 83 |
| Table 11. Standardized Direct Effects of Exogenous Variables on Endogenous Variables | 134 |
| Table 12. Decomposing the Effects: Total Indirect and Specific Indirect Effects of School Bond on Postsecondary Education | 137 |
| Table 13. Decomposing the Effects: Total Indirect and Specific Indirect Effects of School Bond on Offending | 138 |
| Table 14. Decomposing the Effects: Total Indirect and Specific Indirect Effects of School Bond on Incarceration..... | 139 |
| Table 15. Multigroup Hybrid SEM Correlated Path Constraints..... | 140 |
| Table 16. Test of Measurement Invariance in Latent Constructs across Race/Ethnicity | 143 |

| | |
|---|-----|
| Table 17. Cross-Lagged Panel Models between Key Constructs | 146 |
|---|-----|

CHAPTER 1 - INTRODUCTION

The “school-to-prison pipeline” is a term used to describe the processes in which school policies and law enforcement practices push youth out of school and into the juvenile and criminal justice systems (American Civil Liberties Union, 2012; Wald & Losen, 2003) by way of punishing minor, non-criminal infractions such as insubordination, tardiness, and vulgar language, through suspensions or justice system referrals (Sullivan et al., 2010). Schools argue that removing students who violate rules deters other students from misbehaving and improves the school environment (Brown & Clarey, 2012). Ensuring a safe environment is costly and spending on school security is linked to unintended consequences. Annually, American schools spend \$14.8 billion on school safety (Kupchik, 2016). Recently, much of this budget has been used to expand the use of safety personnel in schools. In the 2005-2006 school year, 42% of public schools staffed security guards, school resource officers, or sworn law enforcement, but this percentage has steadily increased to 57% during the 2015-2016 school year (Musu-Gillette et al., 2018).

The increase in school safety personnel is linked to an increase in suspensions (Fisher & Hennessy, 2016) and referrals to the juvenile justice system (Owens, 2017). These exclusionary practices often disproportionately affect youth of color (Skiba, 2008). Black students, representing only 16% of student enrollment nationwide, are disproportionately referred to law enforcement (27%) and disproportionately experience school-related arrests (31%) (U.S. Department of Education, 2014).

Exclusionary school discipline has a notable effect on delinquency, and this association is above and beyond the increased opportunity to offend that students may

have while not in school. For example, for youth who have already been adjudicated delinquent, a subsequent suspension or expulsion increases their risk of arrest in the same month, but no effect is found for truancy (Monahan et al., 2014). Additionally, delinquency is twice as likely during a day when a student is suspended, compared to weekends (Cuellar & Markowitz, 2015). The association between suspension and arrest is partially linked to an increase in delinquency post suspension (Mittleman, 2018), and evidence finding that youth who are excluded in school engage in more delinquency is well documented (e.g., Cuellar & Markowitz, 2015; Fabelo et al., 2011; Gonzalez, 2012; Harlow, 2003; Lee et al., 2011; Monahan et al., 2014; Wolf & Kupchik, 2017). Successfully completing school is also critical to adult roles. Beyond delinquency, other consequences of school exclusion include unstable employment (McCaul et al., 1992; Rumberger & Lamb, 2003; U.S. Department of Labor, 2018) and decreased college enrollment (Rosenbaum, 2018; Rumberger & Lamb, 2003).

Much of the literature surrounding the school-to-prison pipeline lacks a theoretical focus and a detailed investigation into both the factors that contribute to school exclusion and the effects of school removal. The developmental and life-course (DLC) perspective in criminology considers how the timing of life events across the life course influences antisocial behavior (Farrington, 2003a) and recognizes that adolescence is a critical period in the life course in which youth are exposed to a variety of factors that may influence future deviance; however, schools and education have not been a key focus (Payne & Welch, 2016). Negative school experiences are among the many risk-factors of adolescent delinquency, which include, but are not limited to: high-crime

neighborhoods, delinquent peers, poor parental supervision, poverty, and impulsivity (Farrington, 2000; Farrington, 2003b; Hawkins et al., 1998).

Schools serve as a major source of socialization and can reinforce social norms and values during adolescence (Vazsonyi & Flannery, 1997). As development is embedded within social institutions (Elder, 1985), a focus on adolescents' key social institution is necessary in understanding how adolescents' experiences in school influence their subsequent antisocial behavior or encourage them to engage in prosocial institutions as adults.

Outside of the DLC lens, Hirschi's (1969) social control theory explicitly focuses on how youths' bond to school, including their attachment to teachers and commitment and involvement in school activities, is related to delinquency. A number of scholars have considered how a weak bond to school is positively associated with delinquency (Alvarez-Rivera & Fox, 2010; Cernkovich & Giordano, 1992; Liljeberg et al., 2011; Sabatine et al., 2017; Seddig, 2016; Unnever et al., 2009; Wong, 2005), school misconduct (Free, 2014; Hart & Mueller, 2013; Jenkins, 1997; Peguero et al., 2011; Stewart, 2003; Welsh et al., 1999; Welsh, 2001) and problematic behaviors (Unnever et al., 2016).

Although Hirschi's (1969) original test of social control theory was used to explain delinquency, there is evidence that this theory better accounts for less serious forms of deviance (Krohn & Massey, 1980), and has appropriately been applied to explain negative behaviors in school that do not rise to the level of delinquent acts. For example, while there is evidence that a weak bond to school contributes to general school misbehavior, Free (2014) found that belief in school rules was negatively associated with

classroom misbehavior, specifically. A stronger attachment to school and higher levels of school commitment are also associated with fewer externalizing behaviors (Unnever et al., 2016); and youth with negative attitudes toward school are more likely to use marijuana (Zaharakis et al., 2018). For males, involvement in school extracurricular activities, studying, and doing homework have also been linked to reductions in school misbehavior and delinquency, and increases academic achievement (Booth et al., 2008; Hirschfield & Gasper, 2011; Huebner & Betts, 2002). Importantly, some research has explored how bonds to school are related to suspension, finding that students who are less committed to school and have a weaker bond to school (e.g., do not feel safe, are not proud to be part of school, do not believe good grades are important) are more likely to be suspended (Hemphill et al., 2014; Kupchik & Alleyne, 2017). While evidence surrounding social control theory, with specific respect to school bonds, in relation to delinquency is vast, there is a need for more complex assessments of how these bonds may be interconnected with experiences and events both in and out of school (Hirschfield, 2018a).

Several lines of research exist to examine whether adolescents' experiences in school impact a variety of deviant behaviors and outcomes, but clarity on the connections and developmental progressions between these varying outcomes is needed. As stated by Hirschfield (2018a), "...the constructs of greatest interest to most criminologists who study schools and crime are tangled in a web of proximate, reciprocal influence" (p. 163). As such, there is a need to disaggregate "the influences of closely interrelated endogenous school factors" (Hirschfield, 2018a, p. 163). This dissertation seeks to fill the gaps identified above by employing a longitudinal model that connects school bond,

school misbehavior, delinquency, school exclusion, and young adult roles through a DLC lens. The proposed model extends the link between school bond and school misbehavior to include delinquency, school exclusion, and dropout to provide a full examination of the processes that feed into the school-to-prison pipeline. Importantly, the model also recognizes that negative school experiences may compromise the acquisition of human capital (skills and knowledge acquired through education) and social capital (competences and advantages achieved through social relationships) (see Coleman, 1988; Hagan, 1997), which may manifest as difficulties with romantic relationships, employment, and enrollment in post-secondary education in young adulthood. In this way, school exclusion and dropout are situated as critical intervening factors in a “state dependence” process (see Nagin & Paternoster, 2000), linking problematic school bonds among adolescents to key sources of informal social control as youth make (or approach the) transition to young adulthood. To provide insights into possible avenues for early intervention, this dissertation also examines individual, family, peer, neighborhood, and other scholastic factors as exogenous predictors of weak school bonds.

When examining the developmental processes that contribute to and result from school exclusion, it is important to acknowledge that there may be critical differences in how these processes unfold for different racial groups. Hawkins (1995, 2003) argues that race and ethnicity should be at the center of criminological research, as the social processes and factors linked to crime and delinquency may work differently for each racial and ethnic group. As there is evidence that race moderates the effects of school bonds (Cernkovich & Giordano, 1992; Liska & Reed, 1985; Peguero et al., 2011; Peguero, Bondy, & Hong, 2017), and minority youth are disproportionately sanctioned in

school (Advancement Project, 2005; Chu & Ready, 2018; Costenbader & Markson, 1998; Eitle & Eitle, 2004; Fabelo et al., 2011; Hinojosa, 2008; Kupchik & Alleyne, 2017; Mittleman, 2018; Peguero, Bondy, & Shekarkhar, 2017; Pesta, 2018; Skiba, 2008; Skiba et al., 2002; Skiba et al., 2014b; U.S. Department of Education Office for Civil Rights, 2014), a multigroup sample of White, Black, and Hispanic youth is used to evaluate whether developmental differences exist due to differing racial experiences.

The following chapter details the literature pertaining to the causes and effects of school exclusion and provides an overview of school bonding and school-focused DLC literature. Subsequent chapters present the research questions, methods, analytic plan, and results, concluding with a discussion of implications for theory and policy, and areas for future research.

CHAPTER 2 - LITERATURE REVIEW

School Exclusion and Dropout

In 2017, serious disciplinary action (“out-of-school suspension lasting 5 days or more, removals with no services for the remainder of the school year [expulsions], and transfers to specialized schools” Musu-Gillette et al., 2018, p. 110) was used in 37% of public schools nationwide. Out-of-school suspension was the most frequent disciplinary action (72%) and the lead reason for serious disciplinary actions was for physical fights or attacks (26.9%), followed by drug offenses (18.6%), non-firearm weapons offenses (10.4%), alcohol offenses (8.1%), and firearm offenses (2.0%) (Musu-Gillette et al., 2018). Other sources, however, reveal that minor infractions, such as disobedience, insubordination, tardiness, and truancy, account for between 20% and 80% of suspensions (Brooks et al., 2000; Morgan-D’Atrio et al., 1996; Raffaele Mendez & Knoff, 2003; Skiba et al., 2014b). Expulsions occur much less frequently—representing between 2% and 4% of disciplinary actions (Musu-Gillette et al., 2018; Skiba et al., 2014b). Multiple suspensions are more likely to occur when youth have been suspended at a young age. For example, youth who are suspended by age nine are more likely to experience subsequent suspensions or expulsions by age 15, compared to youth who are not suspended at an early age (Mittleman, 2018).

The effects of harsh disciplinary policies are disproportionately placed on minority students. Nationally, Black students constitute about 32% of in-school and out-of-school suspensions and 34% of expulsions, but only 16% of the public school population (U.S. Department of Education, 2014). Additionally, Black youth have historically been suspended at a higher rate than their White classmates in every state (Advancement

Project, 2005). Criminological research supports these national data, finding that Black students are suspended (Chu & Ready, 2018; Costenbader & Markson, 1995; Eitle & Eitle, 2004; Fabelo et al., 2011; Hinojosa, 2008; Kupchik & Alleyne, 2017; Mittleman, 2018; Mizel et al., 2016; Skiba et al., 2002; Skiba et al., 2014b) and expelled (Mizel et al., 2016; Skiba et al., 2002; Skiba et al., 2014b) at higher rates than their White counterparts. Studied less frequently, Hispanic youth are also disproportionately suspended or expelled (Fableo et al., 2011; Kupchik & Alleyne, 2017; Pesta, 2018), and more likely to drop out (Peguero, Bondy, & Shekarkhar, 2017; Pesta, 2018) compared to White youth, but this disparity is less prominent for Hispanic youth than for Black youth.

Sources of School Exclusion and Dropout

Beyond examining race and other sociodemographic factors as correlates to school exclusion and dropout, research exploring the causal pathways to suspension, expulsion, and dropout is much more limited. Many studies focus on achievement as a precursor to school exclusion. For example, reading achievement (Arcia, 2006), academic engagement, and perceptions of higher expectations from teachers are linked to lower out-of-school and in-school suspensions (Hinojosa, 2008). Other studies focus on behaviors that are likely to be associated with school punishment, finding that youth who are suspended are less compliant with rules and are more physically aggressive (Costenbader & Markson, 1995). Each of these predictors of school exclusion, achievement, and antisocial behavior may share common causes: early disruptive behaviors and IQ (Fergusson & Horwood, 1995). Turning to dropout, while a direct link between suspension and dropout may exist (Balfanz et al., 2014; Fabelo et al., 2011; Shollenberger, 2015; Suh & Suh, 2007; Sweeten, 2006), school disengagement (Henry et

al., 2012), low achievement (McCaul et al., 1992), aggression (Cairns et al., 1989), and antisocial behavior (French & Conrad, 2001; McCaul et al., 1992) are also associated with an increased likelihood of dropping out of school.

Failing to complete high school is common among incarcerated adults. Half of all federal prison inmates and nearly 70% of state prison inmates have dropped out of school (Harlow, 2003). When considering system involvement during adolescence, some criminological research has specifically focused on youths' involvement with the juvenile justice system and its effect on school exclusion and dropout. Given that the present study's sample is comprised of first-time juvenile offenders, this line of research is particularly relevant. Though different measurement strategies and definitions of system contact have been employed (e.g., adjudicated delinquent, stopped by police, charged/arrested, incarcerated), prior studies have demonstrated that contact with the justice system during adolescence has negative effects on educational attainment (De Li, 1999; Tanner et al., 1999) and decreases the likelihood of remaining in school somewhere between 11% and 670% (Bernburg & Krohn, 2003; Hirschfield, 2009; Hjalmarsson, 2007; Sweeten, 2006).

School disruption is detrimental for system-involved youth. Youth who transition to a different school after their first contact with the juvenile justice system are more likely to reoffend, compared to youth who remain at the same school (Fine et al., 2018). In addition to the relationships found between system contact and school completion, individuals who are involved with the juvenile justice system or come in contact with the police during adolescence are more likely to engage in general offending, serious crime,

and drug selling, but this effect is attenuated by completing high school (Bernburg & Krohn, 2003).

Looking beyond school, justice system contact can also negatively impact employment in young adulthood (Bernburg & Krohn, 2003; De Li, 1999; Tanner et al., 1999). While some research finds that the effects of system-involvement on dropout (Sweeten, 2006) and employment (Bernburg & Krohn, 2003) do not vary by race, contact with the justice system during adolescence does differentially impact offending in young adulthood—stronger effects are found for Blacks than Whites (Bernburg & Krohn, 2003). Related, completing additional years of school has a larger effect on the reduction of incarceration for Black adults, compared to Whites (Bell et al., 2016).

Effects of School Exclusion and Dropout

The effects of suspension and expulsion on arrest can occur relatively quickly. For example, Monahan and colleagues (2014) found that youth who are suspended or expelled are about twice as likely to be arrested during the same month, compared to months in which the same youth were not suspended or expelled. Nevertheless, they were unable to determine whether the arrests occurred before, after, or were a cause of the suspension or expulsion and did not find an association between school exclusion and an arrest in the following month. Other studies, however, have found an association between suspension and subsequent arrest, delinquency, and justice system involvement. For example, Mowen and Brent (2016) conclude that, over a four year period, suspension increases the odds of arrest. Looking to the year following school suspension, youth are 1.5 times more likely to engage in delinquency (Hemphill et al., 2017), and youth who are suspended or expelled for a discretionary violation are nearly three times as likely to

come in contact with the juvenile justice system (Fabelo et al., 2011; see also Cuellar & Markowitz, 2015). The effect of suspension on subsequent offending has been demonstrated at both the between-individual and within-individual levels of analysis (Mowen et al., 2019). For example, Mowen and colleagues (2019) demonstrated that over a four-year period, suspensions have cumulative effects on offending, wherein each additional suspension increases the likelihood that an individual will engage in future delinquency.

Turning to the long-term effects of suspension, students who are suspended by age nine, age 12, or at any point in their school career, are more than twice as likely to be arrested by age 15 (Mittleman, 2018), by age 18 (Novak, 2019) and between the ages of 25-31 (Rosenbaum, 2018), respectively. While some evidence states that all individuals who are suspended are more likely to experience victimization, engage in criminal activity (Wolf & Kupchik, 2017), and be incarcerated as adults (Arum & Beattie, 1999; Wolf & Kupchik, 2017), studies that focus on racial differences find that the odds of adult offending are higher for Black youth who are suspended or expelled, compared to White youth (Pesta, 2018). Expulsion, though studied less frequently, also exhibits long-term effects on the likelihood of becoming incarcerated as an adult (Jagers et al., 2016), but the literature is inconsistent (Arum & Beattie, 1999).

In addition to increasing the likelihood of justice-system involvement and delinquency, suspension can also have immediate effects on school performance. For example, Chu and Ready (2018) found that students who are suspended during the first three semesters of high school are more likely to fail math and English classes, be absent or tardy, and drop out in the semester following suspension. Similarly, Morris and Perry

(2016) found that students who are suspended achieve lower reading and math scores over a three-year period (see also Ibrahim & Johnson, 2020). Turning to the long-term effects of school exclusion, students who are suspended are less likely to graduate (Chu & Ready, 2018; Rosenbaum, 2018) or achieve a bachelor's degree (Rosenbaum, 2018).

When examining the short- and long-term effects of dropout on arrests and offending, the results are mixed. Thornberry and colleagues (1985) found that while arrests increased in the year following dropout for youth who dropped out at ages 16 and 18, arrests decreased for youth who dropped out at age 17. However, when they investigated the effect of dropout on delinquency through the age of 24, they found that irrespective of age of dropout, individuals who leave school offend at a significantly higher rate than high school graduates. Na (2017) found evidence that the timing of dropout does not change the positive relationship between dropout and subsequent arrests through age 20, but found no relationship between dropout and future self-report offending. Henry and colleagues (2012) parsed young adult offending into subtypes and found that dropout was directly related to an increase in violent offending, arrest, and drug and alcohol use. These authors also explored intervening processes and found that dropout mediates the effects of school disengagement on crime in young adulthood. Consistent with Thornberry and colleagues (1985), Sweeten and colleagues (2009) found that overall, individuals who dropped out of school were more likely to be delinquent than those who graduated across all time points. However, when considering other factors, they found that differences in within-individual offending for individuals who dropped out compared to those who graduated were fully explained by other mediators, such as prior arrests, low academic achievement, young mothers, and sexual activity.

The reason for dropout may exhibit differential effects on subsequent offending. Using survey data from individuals aged 15 to 22, Jarjoura (1993) found that individuals who dropped out to get married, due to pregnancy, because they disliked school, or for unspecified reasons are more likely to engage in violence. However, dropping out due to disliking school, expulsion, or unspecified reasons are the only circumstances that predict theft and selling drugs. Dropping out due to poor grades, problems at home, and financial reasons did not predict either type of offending. Sweeten and colleagues (2009) also examined whether reasons for leaving school were related to delinquency and found that for males, dropping out for economic reasons (offered employment, joined military, financial difficulties) decreased subsequent offending. While it is possible that this relationship exists due to individuals finding employment after leaving school, the authors found that the effect of dropping out for economic reasons on offending decreased over time, which may mean that individuals who left school for this reason had difficulty finding stable employment. This notion is consistent with the evidence that individuals who do not complete high school are more likely to be unemployed (U.S. Department of Labor, 2018).

Mediators to School Exclusion and Dropout

Very few studies fully examine the effects of school exclusion and dropout over the life course, which includes considering earlier events and pathways that lead to school exclusion and dropout—“virtually all of these studies consider the culmination of the process, school dropout, rather than earlier manifestations of school disengagement” (Henry et al., 2012, p. 158). Notwithstanding this limitation, research in this area

highlights a critical link between school exclusionary practices, juvenile delinquency, and adult experiences.

There is some evidence that dropout has a direct connection to adult problem behaviors and mediates the relationship between academic engagement and adult offending (Henry et al., 2012). However, Skiba and colleagues (2014a) agree that:

...it seems unlikely that increased suspension and expulsion in and of themselves create a strong direct link to juvenile justice outcomes, since only a certain percentage of students who are suspended ultimately become involved with juvenile justice. Rather, the effects of exclusion are probably mediated by a number of short-term negative outcomes that are presumably increasing the risk of more severe outcomes, such as dropout and juvenile justice involvement. (p. 551-552)

Mediators proposed by Skiba and colleagues' (2014a) school-to-prison pipeline model include school climate, engagement/lost educational opportunity, and achievement/behavior. Importantly, the proposed model was limited to occurrences *after* school exclusion, and did not propose factors that may *lead to* school exclusion.

Pesta (2018) conducted the only study, to my knowledge, to date, that examined delinquency and dropout as mediators between suspension/expulsion and adult offending across race. Using the first three waves of Add Health data, which span from early adolescence into early adulthood (11-26 years old), different effects of school exclusion were found between White, Black, and Hispanic young adults. For Whites, exclusionary discipline (suspension or expulsion) had no direct effect on adult criminality, but had an indirect effect on adult criminality through adolescent delinquency. Although delinquency increased the odds of offending in adulthood by 7%, exclusionary discipline *decreased* the odds of delinquency by 19%, which indicates that school exclusion may have short-term deterrent effects for White youth. In addition, while exclusionary

discipline directly increased the likelihood of dropout, dropout did not subsequently affect adult offending. For Blacks, exclusionary discipline has both a direct effect on adult criminality, and an indirect effect through dropout. Exclusionary discipline was not significantly related to delinquency, and, surprisingly, delinquency was not significantly related to offending in adulthood. For Hispanics, exclusionary discipline had no direct effect on adult criminality, or an indirect effect through delinquency.

Suspension/expulsion were associated with an 82% increase in the odds of dropout, and dropout was positively associated with adult offending ($p = .055$).

While Pesta (2018) examined important mediators of the school-to-prison pipeline, including dropout and delinquency, the study did not examine earlier experiences that may have contributed to school exclusion, nor did it consider critical aspects of informal social control as youth make the transition to adulthood that may act as important mediators along the pathway from school disengagement to adult offending. As described above, much of the literature exploring links to school exclusion focus on sociodemographic factors and finds strong evidence of racial disparity in school exclusion and dropout. Fewer studies examine other links, but those that do find a significant relationship between school disengagement and both problem behaviors and school exclusion. Separately, research that has focused on the short- and long-term effects of school exclusion finds positive associations with delinquency, arrest, and unemployment, but has mostly ignored earlier predictors of suspension and dropout. In order to fully investigate the school-to-prison pipeline, both factors *preceding* school exclusion and factors *succeeding* school exclusion must be considered in a cohesive theoretical lens.

Theoretical Framework

Though several major criminological theories can be used as frameworks to investigate the roles of schools in delinquency—such as labeling (Lemert, 1951; 1967), self-control (Gottfredson & Hirschi, 1990), and social learning (Akers, 1973)—social control is of primary interest in the present study, particularly with respect to school bonds. Hirschi's (1969) social control theory is based on the idea that people are inherently self-serving, and that criminal and delinquent acts provide gratification (see also Gottfredson & Hirschi, 1990). Instead of seeking to explain why juveniles commit crime, social control theory explains why they refrain from deviance or, in other words, why they conform to societal expectations of behavior. At its core, social control theory asserts that a person is free to commit criminal acts because his/her bond to conventional society is weak or broken. Hirschi (1969) advances four elements of the social bond—attachment, commitment, involvement, and belief—and proposes that a strong bond to family, peers, or social institutions, including schools, will reduce juveniles' likelihood of engaging in criminal activities. Due to the focus of this dissertation, I hone in on Hirschi's (1969) concepts of attachment, commitment, involvement, and belief in relation to schools specifically.¹

Attachment is defined as emotional ties to conventional others that deter adolescents from committing crimes in fear that it would hurt these relationships. In a school setting, attachment most often refers to a student's relationship with his/her teachers. When a juvenile is unconcerned with teachers' reactions to delinquent behavior,

¹ Hirschi (1969) also investigates attachment to parents and peers. Attachment to parents will be assessed as a predictor of school bonds. Delinquent peers will also be included as a predictor of school bonds, though attachment to peers has been found to influence delinquency, not conformity (see Akers et al., 2016)

he/she is free to deviate because he/she does not care about harming teacher relationships. Furthermore, a student who does poorly in school may become less attached, which frees him/her to commit delinquent acts. Hirschi (1969) argues that students who dislike school and do not value the opinions of teachers are more likely to question the school's legitimate authority and engage in deviance.

Commitment refers to juveniles' investment and dedication to conventional activities, such as education. Deviance would threaten future success in such activities. According to Hirschi (1969), delinquency is deterred due to fear of its consequences. Before committing a delinquent act, a youth must weigh the costs of this behavior against the risk of losing his/her investment in education or school-related activities. Hirschi (1969) finds that youth who are more committed to their education and who have higher educational aspirations are less likely to become delinquent.

Involvement is the time spent in conventional activities. According to Hirschi (1969), when youth are involved in activities, they have less time to commit deviant acts because their time in general is limited. When examining youths' bonds to school, involvement in after-school activities is often measured. Hirschi (1969) highlights the difficulties often associated with measuring involvement in control theory. For example, delinquency itself requires very little time. In order to properly measure involvement, it may be necessary to account for all time, both free time and time spent in conventional activities, to find differences that lead to delinquency. It is also important to consider what type of activity a youth participates in, as participation alone may not be sufficient to reduce delinquency.

Belief pertains to the degree in which adolescents value or conform to society's rules and norms. A youth avoids deviant behavior because he/she believes in society's rules. The less strongly a youth believes in these rules, the more free he/she is to deviate. Hirschi (1969) states that delinquency is not a result of delinquent beliefs but, rather, it is the absence of conventional beliefs that permit delinquency and finds that youth who respect police and believe that people should obey the law are less likely to engage in delinquency. Contemporary studies that have evaluated the relationship between school bonds and deviance have adapted the belief construct to school settings, defining this measure as a student's belief in school rules and policies (Free, 2014; Jenkins, 1997; Peguero et al., 2017; Peguero et al., 2011; Stewart, 2003). Similar to the original measure, if a student does not believe in, or conform to, these rules, he/she is more likely to become delinquent in school.

According to Hirschi (1969), a strong bond to school has the ability to facilitate a transition from childhood to adulthood with minimal criminal behavior and has the ability to protect a juvenile from delinquency, regardless of parental ties. Despite this argument, very little research has extended the application of school bonds through adulthood. The following section highlights the extent of prior school bond-specific studies. Due to variations in data sources, numerous measurement and modeling differences exist among this literature. Despite this, most studies find a connection between weak bonds and subsequent school misbehavior, delinquency, or problem behaviors.

Racial Differences in School Bonds

Although Hirschi (1969) has been criticized for proposing a theory based on an entirely White male sample, thereby ignoring race (Unnever et al., 2009; 2016), very few

studies have investigated racial/ethnic differences in school bond measures. In the earliest exploration of school bonds across race, Cernkovich and Giordano (1992) found that, on average, Black males have higher levels of school attachment, commitment, and involvement, compared to White males. Notably, perceived racial discrimination may be related to Black youths' bonds to school. Unnever and colleagues (2016) found that Black youth who experienced racial discrimination exhibited lower levels of both commitment to school and attachment to teachers. Exploring the effects of institutional attachments on status offenses for Hispanic youth, Alvarez-Rivera and colleagues (2017) found that attachment to school was more strongly related to a reduction in status offending than attachment to church or parents. However, neither Unnever and colleagues (2017) nor Alvarez-Rivera and colleagues (2017) examined comparison racial groups.

In general, studies that explore racial differences in school bonds are inconsistent. While some studies find that no differences exist between White, Black, and Hispanic youth on commitment to school (Cavendish et al., 2012), others do find significant differences in several bond measures. For example, Peguero and colleagues (2011) explored a broader range of race/ethnicity and found that Black youth generally scored lower on school attachment, commitment, involvement, and belief than Hispanic, Asian, and White youth.

Using the same dataset, Peguero, Bondy, and Hong (2017) analyzed a subsample of youth to establish whether generational status affects youths' bonds to school. First, they found that when controlling for a number of student, family, and school characteristics, Black, Hispanic, and Asian youth had significantly higher commitment to

and involvement in school, compared to White youth. Only Asian youth had significantly higher attachment and belief than White youth. Next, they evaluated whether being a first-generation (born outside of the United States) or second-generation (at least one parent born outside of the United States) student interacted with race/ethnicity. Compared to third-plus-generation (both youth and parents born in the United States) White youth, first-generation Black, Hispanic, and Asian youth have significantly higher levels of school attachment, commitment, and belief. Only first-generation Asian students have a significantly higher involvement in school activities, compared to third-plus-generation White students. These results weaken as youth become more assimilated. For second-generation youth, only Asian students have a significantly higher bond for each measure, compared to third-plus-generation White students. Second-generation Black and Hispanic youth have significantly higher levels of commitment, and Hispanic youth have significantly higher levels of involvement, compared to third-plus-generation White youth. In sum, the limited racial explorations of school bonds are mixed and warrant further exploration.

School Bonds and Delinquency

While much of the research on school social bonds has focused on how these bonds impact delinquency, empirical tests that include all four school-specific bonds (school/teacher attachment, school commitment, school involvement, belief in school rules) are rare. Despite this, most studies find a relationship between some aspect of the school bond and delinquency. For example, Wong (2005) found that time spent studying or doing homework and attachment to school are negatively associated with delinquency.

Cernkovich and Giordano (1992) evaluated whether the effects of school bond on delinquency differed across race. They found that while higher school commitment significantly reduced delinquency for both White and Black males, school attachment was only related to a reduction in delinquency for Black males, and involvement significantly *increased* delinquency for Black males. In contrast, Unnever and colleagues (2009) found that when controlling for perceived discrimination, involvement (time spent doing homework) is the only bond that remains significantly associated with reduced delinquency. In fact, time spent doing homework may act as a protective factor for Black youth who perceive discrimination—those who experience discrimination and spend more time completing homework are less likely to engage in delinquency than those who spend less time on homework. In Hispanic populations, attachment to school is negatively associated with delinquency (Alvarez-Rivera & Fox, 2010).

In addition to the cross-sectional findings discussed above, the relationship between a stronger school bond (liking school, effort, belonging, attachment to teachers) and lower delinquency has been upheld longitudinally (Sabatine et al., 2017). Using a sample of boys identified as aggressive at ages 10 and 11, O'Donnell and colleagues (1995) found that higher levels of school bonding at ages 12 and 13 (commitment and attachment to school, educational expectations, grades, and teacher support) are negatively associated with serious delinquent behavior and substance use one year later. Examining specific constructs, weak attachment to school and teachers and poor commitment significantly increase delinquency over time (Liljeberg et al., 2011).

Inconsistencies in involvement's association with delinquency are common. However, reconsidering how involvement is measured by assessing the activity types in

terms of school-, family-, or peer-related sheds light on which types of activities are significantly related to delinquency. For example, Wong (2005) concluded that while time spent studying or doing homework is negatively associated with delinquency, time spent watching TV, playing sports, in religious activities, working, dating, hanging out with friends or family, or “doing nothing” is not (see also Osgood et al., 1996). In addition, time spent in prosocial activities had a stronger indirect effect on reducing delinquency through strengthening youths’ social bond (attachment to parents, school, peers; respect for law), as opposed to reducing delinquency directly (Wong, 2005).

Following another alternative measurement strategy, Krohn and Massey (1980) argued that involvement should be subsumed in commitment, as involvement represents the time element of commitment and is not a distinct construct conceptually. These authors defined commitment as participation in school-related activities, educational and career aspirations, and GPA. Measured in this way, commitment explained a higher proportion of variance in serious drug use, minor delinquency, and serious delinquency than attachment (maternal, paternal, peer) and belief (parental norms, legal norms, educational value). Overall, the research linking school bonds and delinquency is largely consistent in both cross-sectional and longitudinal analyses, though findings concerning racial differences in the relationship between school bonds and delinquency differ across studies.

School Bonds and School Misbehavior

In addition to studies that focus on delinquency as an outcome of weak bonds to school, some scholars have specifically focused on school misbehavior as an outcome. In one of the earliest studies that fully examined the effect of school bonds on school

misbehavior, Jenkins (1997) found that while commitment to education, belief in school rules, and attachment to school were negatively associated with school misconduct and nonattendance, and higher levels of commitment and belief led to reductions in school crime, involvement in school activities was not significantly related to any measure of school misbehavior.

The relationship between involvement and school misbehavior in other studies that examine all four components of the school bond is mixed. While some studies have similarly found a significant relationship between school attachment, commitment, and belief, and a lack of significance for involvement in relation to school misbehavior (Peguero et al., 2011; Stewart, 2003), others have found that higher levels of involvement significantly reduce school misbehavior (Hart & Mueller, 2013). It is possible that how involvement is measured affects its relationship with school deviance, similar to the discussion above regarding involvement's association with delinquency. For example, studies that report null findings between involvement and school misbehavior used multi-item indexes to capture a variety of activities (Jenkins, 1997; Peguero et al., 2011; Stewart, 2003), whereas measuring the amount of time spent in activities has demonstrated a significant negative relationship with school deviance (Hart & Mueller, 2013).

Similar to the delinquency literature, while much of the research that examines the relationship between school bonds and school misbehavior controls for race, few studies explore specific differences across race/ethnicity. Research that fails to investigate differences in these relationships across race/ethnicity may incorrectly assume that the relationships between school bond and delinquency are consistent for all

demographic backgrounds. For example, Peguero and colleagues (2011) find that higher levels of school attachment, commitment, and belief significantly reduce school misbehavior controlling for race/ethnicity, but differences emerge when exploring interactions between race/ethnicity and school bonds. For Black youth, the effect of attachment and commitment on school misbehavior is weaker compared to White youth, but there is no difference between Black and White youth for the effects of involvement and belief. For Hispanic youth, the only difference is found for involvement, where the effect on school misbehavior is stronger for Hispanic youth than White youth. Finally, for Asian youth, the effect of commitment on school misbehavior is stronger compared to White youth.

In sum, most studies find that weak school bonds predict school misbehavior. Similar to studies that explore the effects of school bonds on delinquency, the involvement element of the school bond contributes to inconsistent findings. Explorations of racial/ethnic differences are extremely limited, but indicate that the effects of school bonds on misbehavior may vary by race/ethnicity.

School Bonds and Problem Behavior: Mediation, Moderation, and Reciprocal Effects

School bonds can have direct and indirect effects on delinquency (Erickson et al., 2000). When considering the relationship between school bonds and delinquency with cross-sectional data, Seddig (2016) found that although school bonds did not have a direct effect on delinquency, they did have an indirect effect through the acceptance of legal norms. Arguably, norms are analogous with the social bond construct of belief, demonstrating that certain elements of social control theory may affect one another.

Exploring moderation, Spratt and colleagues (2005) explored the interactive effects of a global school bond measure with early aggression, risk, and deviant peers. These authors found that a strong school bond is especially effective in reducing violent offending for youth with early aggression and who are high risk (i.e., they experience hostile parenting, parental depression, and neighborhood problems), but found no interaction for deviant peers. For non-violent offending, a strong school bond produces larger reductions in this offense type for youth who are high risk and have deviant peers, but not for youth with early aggression.

While most studies focus on the impact of school bonds on an outcome, such as delinquency or school misbehavior, others explore reciprocal effects of school bond and problem behaviors. For example, though not a test of the full theory, Liska and Reed (1985) found that two types of delinquency (violence and theft/vandalism) decrease school attachment, and that school attachment also reduces instances of theft/vandalism. However, after examining subgroups of White and Black youth, they found that the effect of higher school attachment on reduced delinquency was only present for Black youth, whereas the effect of higher delinquency on lower school attachment was only present for White youth.

Similarly, Liljeberg and colleagues (2011) examined the cross-lagged effects of school attachment, teacher attachment, and school commitment on delinquency 18 months later and found that while all three school measures were negatively associated with delinquency, higher levels of delinquency only predicted lower school commitment for males. Other explorations of cross-lagged effects find that while school attachment does not predict delinquency during the next school year, there is evidence of a

contemporaneous association between delinquency and school attachment, in which higher levels of delinquency are associated with lower school attachment (Hoffman et al., 2013). Mirroring the inconsistent findings of two-wave studies, Seddig (2016) found that higher delinquency did not predict lower school bonds consistently across multiple waves.

Implications of School Bonds for Young Adult Bonds to Society

As discussed above, explorations of school bonds have extensively detailed the short-term effects on school misbehavior and delinquency, however, there is very little consideration of how school bonds may ultimately influence conventional roles in young adulthood. Developmental and life-course (DLC) criminological theories aim to explain the effects of different life events and risk factors throughout the life course on within-individual changes in the development of deviant behavior (Farrington, 2003a). The timing and consequences of events early in life can impact outcomes much later (Elder, 1994). Institutional bonds to school, work, and family are critical aspects of social control. Strong ties to these institutions can be formed at any point in the life course (Sampson & Laub, 1993; 2003; Laub & Sampson, 2003), but the timing and sequence of these attachments are important (Elder, 1985). Youth who engage in delinquency, especially those who become justice system-involved, are likely to experience subsequent negative consequences, such as school failure and unemployment, that contribute to offending in young adulthood (Sampson & Laub, 1993).

Sampson and Laub's (1993; 2003; Laub & Sampson, 2003) age-graded theory of social control acknowledges that schools may act as a turning point in the life course, where positive experiences and establishing a commitment to education can allow

prosocial or conventional bonds to form in young adulthood, and negative experiences or a weak attachment to school may contribute to offending and an inability to secure conventional adult roles throughout the life course. Though several other DLC theorists have acknowledged that negative school experiences affect offending and conventional roles in young adulthood (Catalano & Hawkins, 1996; Farrington, 1992; LeBlanc, 1997; Moffitt, 1993; Thornberry, 1987; Thornberry & Krohn, 2001), theory and research on schools and education has “not been a primary focus” of many developmental and life-course theories (Payne & Welch, 2016, p. 748).

One of the widely accepted notions of DLC theories is that delinquency peaks in the late teenage years and declines in early adulthood (Farrington, 1986; Sampson & Laub, 2003). While parents act as a primary source of socialization in childhood, during mid to late adolescence schools (and peers) become a more prominent source of socialization. In fact, bonds to school are most evident during mid adolescence (LaGrange & White, 1985) and have been shown to mediate the effects of early adolescence parenting quality on delinquency (Hay et al., 2017).

Schools expose youth to a number of risk and protective factors that may encourage or dissuade delinquent behavior. For example, youth who are committed to education are less likely to engage in substance use (Eassey et al., 2015; Jessor, 1976; Schulenberg et al., 2005; Thornberry et al., 1991) and violence (Hawkins et al., 1998; Herrenkohl et al., 2012); and youth who feel connected to school are less likely to exhibit emotional distress, suicidal thoughts and behaviors, substance use, violence, and become sexually active at an early age (Resnick et al., 1997).

Catalano and Hawkins' (1996) social development model (SDM) states that socialization by prosocial or antisocial families, peers, communities, and schools influences whether individuals engage in prosocial or deviant behavior. Bonds are formed through consistent socialization and create informal controls that guide behaviors. They propose that at different developmental stages *the sources of bonds will change*. For instance, they argue that families are the most important source of socialization during preschool and elementary school, and that peers are critical to middle and high school. The peak in offending during mid to late adolescence is attributed to bonding to antisocial peers during this period.

Importantly, despite Catalano and Hawkins' (1996) proposition, Ayers and colleagues (1999) test of the SDM found that school factors are also critical to offending trajectories. For males, those who were less skilled at schoolwork at ages 12-13 were more likely to engage in delinquency by ages 14-15. Males whose delinquency had declined from ages 12-13 to 14-15 had stronger schoolwork skills, higher achievement test scores, and were rewarded more frequently at school, compared to males whose delinquency remained stable. Furthermore, males who were delinquent at ages 12-13 but did not offend at ages 14-15 had stronger schoolwork skills, higher achievement test scores, and stronger attachment and commitment to school, compared to males who offended at both time periods. Similarly, Chung and colleagues (2002) found that youth who were more bonded to school at ages 10-12 were less likely to offend at age 13 and were more likely to desist through age 21, compared to youth who committed both minor and serious offenses at age 13 and escalated in offending through age 21, respectively.

When applying control theory across the life course, it is important to consider how bonds may change over different life stages. Thornberry's (1987) interactional theory proposes that several measures of social control—attachment to parents, commitment to school, and belief in conventional values—influence each other over time (see also Thornberry & Krohn, 2005). For example, in childhood and early adolescence, parental attachment is more prominent due to the family acting as the main source of socialization. Strong attachment to parents lays the foundation for strong bonds to school, and youths' commitment to school may further reinforce positive relationships with parents. As youth transition through adolescence, however, attachment to parents becomes less prominent, and school bonds become more significant for eventual success in fulfilling adult roles and statuses, such as attending college, becoming employed, getting married, and starting a family. These roles eventually replace commitment to school as the most significant bonds.

In addition, though weak bonds may lead to increased delinquency, as is originally proposed by Hirschi (1969), Thornberry's (1987) interactional theory argues that bonds have a reciprocal relationship with delinquency across all developmental stages, whereby engaging in deviance causes bonds to further weaken. He also proposes that if early bonds to conventional institutions are weak, it is unlikely that strong bonds will be established at any point in the life course. Hirschi (2004), in his merger of self- and social-control theories, makes a similar assertion. Thornberry and colleagues' (1991) longitudinal test of interactional theory across two years of early adolescence (7th-9th grades) revealed that both attachment to parents and commitment to school had significant negative relationships with delinquency during the first year of the study, but

only commitment to school maintained a significant relationship during the second year; additionally, attachment to parents strengthened commitment to school, and delinquency weakened commitment to school and attachment to parents during the same wave.

These findings point to differential impacts of bonds across the life course, supporting Thornberry's (1987) argument that bonds to school become more prominent during adolescence. The contemporaneous relationships also demonstrate that the effects between commitment to school, attachment to parents, and delinquency may occur in a relatively short timeframe. This study did not find support that commitment to school affects attachment to parents; rather, this relationship was unidirectional in which weak attachment to parents leads to decreased school commitment. In short, parent-child relationships appear to have critical implications for school bonds, and thus represent a possible point of early intervention.

As DLC models that examine school bond-specific measures are limited, beyond examining how the relationship between bonds to school and delinquency changes over time, very few studies have explicitly considered how the strength of school bonds differ across the life course. Seddig (2016) explored the developmental nature of school bonds from ages 13 to 17 and found that while bonds weaken between ages 13 and 15, they strengthen beyond initial levels by age 17. In contrast, Jang (1999) found that negative effects of school bonds on delinquency grow steadily from ages 11 to 15, then begin to decrease. Irrespective of these inconsistent findings, it is clear that the effects of school bonds are not constant across the life course, and may fluctuate even within adolescence.

Regardless of these differences, school bonds may have profound implications for school exclusionary experiences which, in turn, may have important consequences for

social bonding to conventional others and institutions in young adulthood. For example, compared to low-level/non-delinquent adolescent offenders, individuals who offend through young adulthood are less likely to have graduated from high school or college, less likely to obtain high-level or steady employment, and more likely to be incarcerated. Individuals who desist by young adulthood are more than twice as likely to have steady employment and be either employed or in school, compared to individuals who continue to offend (Stouthamer-Loeber et al., 2004). Interestingly, though arrest rates for high school graduates are lower, both dropouts and graduates follow the age crime curve, with both groups increasing in arrests during the teenage years, then declining into early adulthood (Thornberry et al., 1985).

In sum, despite the limited exploration of the role of bonds to school in prior DLC literature, there is evidence that a youth's bond to school is an important source of socialization, which has critical implications during adolescence. Though the sources of social control may change over the life course, parents, schools, and conventional young adult bonds are interrelated. While parenting is a prominent socialization source in early adolescence, bonds formed to school during mid-adolescence lay the foundation for prosocial bonds during the transition to young adulthood. Strong bonds early in life are likely to influence strong bonds at later developmental stages, ultimately reducing the likelihood that an individual will engage in delinquency.

Gaps in Knowledge and the Present Study

As outlined above, a breadth of literature exists that explores different stages of the school-to-prison pipeline. The present study will establish a cohesive examination of the school-to-prison pipeline by employing a model of social control across adolescence

and young adulthood to evaluate factors contributing to school exclusion, and the effects of school exclusion and dropout. The social control framework (Hirschi, 1969), as incorporated in major developmental and life-course theories of offending (e.g., Thornberry, 1987; Laub & Sampson, 2003; Sampson & Laub, 1993; 2003), is suitable to the study of the school-to-prison pipeline because it provides an age-graded lens in which both the causes and effects of school exclusion can be examined. As discussed above, the school bond literature is largely consistent in reporting that youth with weak bonds to school are more likely to engage in school misbehavior and delinquency. School misbehavior and delinquency, in turn, are associated with an increased likelihood of experiencing school exclusion and dropout. Finally, individuals who are suspended, expelled, or drop out are more likely to offend and less likely to attain conventional adult roles.

To begin, factors that contribute to the strength of school bond will be considered, such as attachment to parents, to provide insights into possible early intervention points to prevent the school-to-prison pipeline from being set in motion in the first place. While parental involvement in schooling is critical to educational success (Steinberg et al., 1992), relationships between youth and their parents can independently affect school bond. For example, parenting quality during early adolescence (ages 9-12) is predictive of a stronger bond to school during mid adolescence (ages 12-15; Hay et al., 2017). Though school attachment may be more strongly related to delinquency, parental attachment also significantly predicts less delinquency (Alvarez-Rivera & Fox, 2010). As youth age, attachment to parents plays a less salient role than commitment to school in predicting delinquency (Hay et al., 2017; Thornberry, 1987). Therefore, in the present

study maternal attachment is used as an exogenous predictor of school bond at the first stage of the model.

A cohesive model of bonds across adolescence and young adulthood not only allows for the consideration of factors that contribute to school bond, but also allows for the ability to examine both short- and long-term effects of youths' bonds to school. The short-term effects that will be explored in the model include school misbehavior and delinquency. As the literature suggests, it is expected that a weak bond to school will increase school misbehavior and delinquency. In turn, these deviant acts will increase the likelihood that a youth will experience school exclusion. Educational disinvestment is a primary source of disadvantage and can lead to subsequent negative experiences in adult roles, such as employment and parenting (Hagan & Parker, 1999). Multiple disadvantages, such as disengaging in school or becoming involved in the justice system, hurt opportunities to gain conventional roles, such as stable employment (Sampson & Laub, 1997).

School dropout, low academic achievement, and justice involvement are common types of "snares" that effect the ability to successfully transition to prosocial adult roles (Moffitt, 1993). Risk factors, such as school exclusion, that initiate disruptions in the transition to adulthood are known as precocious transitions. For males, low school commitment is predictive of dropout, which subsequently predicts later alcohol and drug use (Krohn et al., 1997). These transitions can lead to low educational attainment and adopting early family responsibilities (Wikrama et al., 2003). In addition, these events can contribute to a cumulative disadvantage by increasing the likelihood of future precocious events (Wickrama et al., 2003). For example, precocious transitions, such as

nest leaving, cohabitation, teen parenthood, and school dropout, affect economic hardship and family problems, which subsequently influences adult offending and arrest (Krohn et al., 2011). When exploring the cumulative effects of low bond to school, school exclusion, and dropout, it is important to consider young adult roles/bonds in addition to future criminal involvement. A weak school bond not only increases the risk of future delinquency, but also the risk of unemployment and dropout (Thornberry, 1987).

In addition to exploring subsequent offending and incarceration resulting from school exclusion or dropout, other bonds that represent conventional roles in young adulthood will be investigated as possible mediators of offending (Sweeten et al., 2009).

As stated by Jajoura (1993):

...dropping out may not represent the same change in the social bond to all dropouts. By the time they leave school, many dropouts already have a weak social bond with the school. The youth who leaves school to take a job or to get married, however, may actually develop a stronger social bond and, in turn, a reduced likelihood of subsequent offending behavior. (p. 151)

In light of this, postsecondary education, employment, and romantic relationships will be explored as young adult bonds that may attenuate the negative impact of dropout and school exclusion. Finally, there is a clear line of research that highlights the disparate treatment of minority youth in both schools and the justice system (e.g., Advancement Project, 2005; Chu & Ready, 2018; Costenbader & Markson, 1995; Eitle & Eitle, 2004; Fabelo et al., 2011; Hinojosa, 2008; Kupchik & Alleyne, 2017; Mittleman, 2018; Mizel et al., 2016; Skiba, 2008; Skiba et al., 2002; Skiba et al., 2014b). As such, this dissertation will cross-examine the experiences of White, Black, and Hispanic youth in order to uncover whether the consequences of a weak school bond vary across race/ethnicity.

CHAPTER 3 - THE CURRENT STUDY

Research Questions and Hypotheses

As discussed above, the present study seeks to add to the existing literature regarding school exclusion and the school-to-prison pipeline by applying a DLC framework to fully explore the antecedents to and ramifications of school exclusion. To do so, four research questions are addressed. Drawing on social bonding theory (Hirschi, 1969) and age-graded social control theory (Sampson & Laub, 1993), the first three research questions center on the developmental processes leading up to the experience of school exclusion and dropout, and the potential adverse consequences of being removed from school. Given the above review of the literature and the centrality of this model to the present study, several hypotheses are offered for each of these three research questions. The final research question is exploratory and asks whether the above noted processes may vary across race/ethnicity; these questions are elaborated below.

Table 1 provides an overview of study variables and the waves in which they are measured. While a full description of study data is presented in the subsequent section, it is important to note that the data are longitudinal in nature and consist of eight waves of data, beginning with baseline (T0) and ending with wave seven (T7). Additionally, Figure 1 presents the full conceptual model, and hypothesized positive and negative relationships are denoted in directional pathways with their corresponding signs.

Table 1. Study Variables and Measurement Waves

| Variable | Wave | | | | | |
|-------------------------|-------------|-------------|-------------|---------------|-------------|---------------|
| | T0 13-17 | T1 13-18 | T2 14-19 | T3-4 14-20 | T5 15-20 | T6-7 17-22 |
| Age | X | | | | | |
| Race | X | | | | | |
| Age | X | | | | | |
| SES | X | | | | | |
| IQ | X | | | | | |
| Grades | X | | | | | |
| Impulsivity | X | | | | | |
| Delinquent Peers | X | | | | | |
| Maternal Attachment | X | | | | | |
| Neighborhood Disorg. | X | | | | | |
| School Bond | | X | | | | |
| School Misconduct | | | X | | | |
| Delinquency | | | X | | | |
| School Exclusion | | | | X | | |
| Dropout | | | | X | | |
| Employment | | | | | X | |
| Postsecondary Education | | | | | X | |
| Romantic Relationship | | | | | X | |
| Offending | | | | | | X |
| Incarceration | | | | | | X |

Research Question 1: What factors contribute to weak school bonds?

Hypotheses 1a-1i: Individuals who (a) are older, (b) are from a higher SES, (c) have a higher IQ, (d) have better grades in school, (e) are less impulsive, (f) have less delinquent peers, (g) have stronger attachment to their mothers, and (h) have less disorganized neighborhoods are *more likely* to have a strong bond to school.

Several covariates are included at baseline as predictors of school bond, including important demographic, family, peer, neighborhood, and educational factors. This research question contributes to the literature by considering a broad range of variables indicative of key developmental processes in adolescence that may influence whether youth form strong bonds to school at a later wave. All covariates are measured at T0,

when youth are 13 to 17 years old. School bond is measured at T1, when youth are 13 to 18 years old.

Research Question 2: What are the direct and indirect effects of school bond on school misbehavior, delinquency, school exclusion, and dropout?

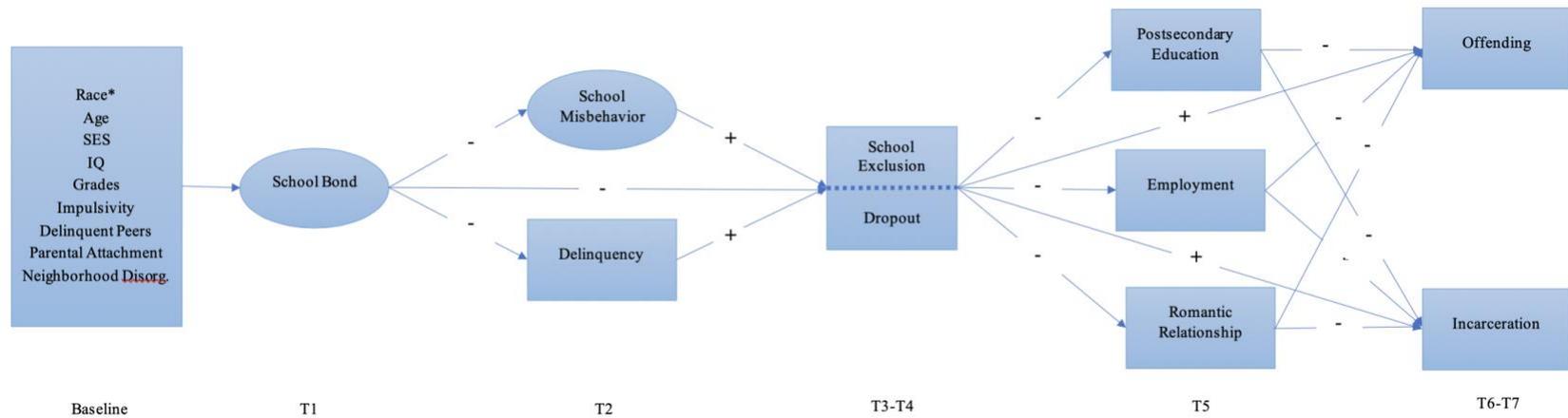
Hypotheses 2a-2d: Individuals with a strong bond to school are *less likely* to: (a) misbehave in school, (b) engage in delinquency, (c) experience school exclusion, and (d) drop out of school.

Hypotheses 2e, 2f: Individuals who (e) misbehave in school and (f) engage in delinquency are *more likely* to experience school exclusion.

Hypotheses 2g, 2h: Individuals who (g) misbehave in school and (h) engage in delinquency are *more likely* to drop out of school.

This stage of the model examines how weak school bond, school misbehavior, and delinquency contribute to school exclusion and dropout. The hypotheses mirror the evidence found in prior literature concerning the effects of school bond on school misbehavior and delinquency and add to the limited knowledge of how school bond impacts school exclusion directly, and indirectly through school misbehavior and delinquency. In addition, this will be the first study, to my knowledge, to examine school misbehavior, delinquency, school exclusion, and dropout as outcomes of school bond in a single model. School bond is measured at T1, when youth are 13 to 18 years old; school misbehavior and delinquency are measured at T2, when youth are 14 to 19 years old; and school exclusion and dropout are measured at T3-T4, when youth are 14 to 19 and 15 to 20 years old, respectively.

Figure 1. Conceptual Model



*Race will be used as a grouping variable in the multigroup SEM model.

Notes: All baseline exogenous variables are used as covariates in each stage of the model (direct paths not shown). School exclusion and dropout are separate endogenous variables, but are combined in the figure for simplicity. Correlations between same-wave constructs are estimated (paths not shown).

Research Question 3: How do the cumulative effects of negative school experiences affect young adult roles (i.e., romantic relationship, postsecondary education, and employment), offending, and incarceration in young adulthood?

Hypotheses 3a-3c: Individuals who experience school exclusion are *less likely* to: (a) be employed, (b) be enrolled in postsecondary education, and (c) to be in a romantic relationship.

Hypotheses 3d, 3e: Individuals who experience school exclusion are *more likely* to: (d) offend and (e) be incarcerated.

Hypotheses 3f-3h: Individuals who drop out of school are *less likely* to: (f) be employed, (g) be enrolled in postsecondary education, and (h) to be in a romantic relationship.

Hypotheses 3i, 3j: Individuals who drop out of school are *more likely* to: (i) offend and (j) be incarcerated.

Hypotheses 3k, 3l: Individuals who are employed are *less likely* to: (k) offend and (l) be incarcerated.

Hypotheses 3m, 3n: Individuals who are enrolled in postsecondary education are *less likely* to: (m) offend and (n) be incarcerated.

Hypotheses 3o, 3p: Individuals who are in a romantic relationship are *less likely* to: (o) offend and (p) be incarcerated.

This stage of the model explores how key social bonds, offending, and incarceration in later adolescence/young adulthood are affected by school exclusion and dropout.

Although prior criminological research has considered how school exclusion and dropout impact offending and incarceration, social controls in later adolescence are less often

considered, and these bonds have not been studied as outcomes of school exclusion or dropout in conjunction with continued offending and incarceration. Further, as the model in the present study includes an examination of the causes of school exclusion and dropout, a number of direct and indirect effects can be considered across each wave, beginning with the formation of the school bond. This allows for multiple intervention points to be considered in order to disrupt the school-to-prison pipeline. Employment, postsecondary education, and romantic relationships are measured at T5, when youth are 15-20 years old. Offending and incarceration are measured at T6-T7 when youth are 16-21 and 17-22 years old, respectively.

Research Question 4: How do these experiences differ between White, Black, and Hispanic youth?

The processes that contribute to and result from school exclusion and dropout will be compared across race/ethnicity. As the prior literature is both limited and mixed regarding differences in school bond across race/ethnicity, no specific hypotheses are presented. Though there is strong evidence of disproportionate school exclusion and dropout for minority youth, prior studies lack a full exploration of the antecedents and consequences of school exclusion and dropout across race/ethnicity. Examining these developmental processes in a multi-group context will lead to a better understanding of whether some, or all, or the developmental pathways linking school bonds to later behavior operate differently across race/ethnicity.

Data

Data for this project are drawn from the Crossroads Study; a three-site study that is presently underway in Philadelphia, PA, Orange County, CA, and Jefferson Parish, LA. At the time of enrollment, all participants were males, between the ages of 13 and 17, English speaking, first-time offenders, and charged with an eligible offense. To identify eligible offenses, juvenile court records were analyzed from 2005-2009. Offenses that resulted in formal processing 35-65% of the time for first-time offenders were selected as eligible charges at each site (Cauffman et al., 2010). In Philadelphia, eligible offenses included:

Aggravated assault, burglary, criminal mischief, indecent assault, possession of an instrument of crime, possession with intent to deliver a controlled substance, possession of a controlled substance, possession of marijuana - personal use, retail theft, robbery, simple assault, terroristic threats, theft, and weapon on school property.

In Orange County, eligible offenses included:

Assault, battery, burglary, drug possession, obstructing a police officer, petty theft, possession of a switchblade knife, public fighting, and vandalism.

In Jefferson Parish, eligible offenses included:

Criminal mischief, disturbing the peace, hit and run driving, illegal possession of stolen things, possession of a CDS schedule 1, simple battery, simple criminal damage to property, theft, and theft of goods.

Participant recruitment took place between July 2011 and June 2013 in all three sites.

Eligible participants' contact information and arrest records were obtained from the juvenile court in each city. After assignment of a disposition (formal or informal), researchers contacted eligible participants to enroll them in the study by meeting youth and their parent/guardian in person after informal court hearings, contacting youth via

phone, and/or mailing letters to their homes. Out of 2,103 youth who were contacted, 1,216 enrolled in the study (57.82%). Baseline interviews took place within six weeks of the disposition. Prior to the baseline interview, each participant signed an informed assent, and his parent or guardian signed an informed consent. All participants who turned 18-years-old during the course of the study signed a consent form to continue their participation.

Data for the present study come from the first four years of interviews, which occurred once every six months for the first three years, then annually (study ongoing). Each interview lasted approximately two to three hours, and was conducted on a laptop. A researcher scheduled each interview either at the participant's home or at a secondary location, such as a detention or residential facility or community location. Occasionally, interviews were completed over the phone if a participant moved or was in placement outside of each city. Each question was read to participants, and response options were provided. At the end of each interview, contact information was gathered and used to schedule follow-up interviews. Participants were paid \$50 cash for the first interview. At each follow-up interview, the pay rate increased by \$15.

In the Crossroads Study, participant retention was remarkably high: 1,162 participants (95.56%) completed wave 1; 1,141 participants (93.83%) completed wave 2; 1,138 participants (93.59%) completed wave 3; 1,131 (93.01%) completed wave 4; 1,122 participants (92.27%) completed wave 5; 1,102 participants (90.63%) completed wave 6; and 1,053 participants (86.60%) completed wave 7. Several strategies were employed to maintain study enrollment. Updated contact information was gathered at the end of each interview and included addresses and phone numbers for study participants, as well as

close family members and friends. On participants' birthdays and on holidays, greeting cards were mailed to the last known address and study contact information was included. If a card was returned as undeliverable, this alerted study staff to attempt phone contact to update the participant's location. Additionally, 30 days prior to an interview's "due" date, study staff would attempt to contact the participant via phone and/or mail out an interview reminder with study contact information. If there was no contact made, study staff would attempt contact via social media, and/or utilize court records to discern whether the participant was incarcerated. Should all else fail, an in-person attempt at the last known address would be made.

Measures

The longitudinal, panel nature of the Crossroads Study allows for a number of different modeling techniques. Given the present study's research questions and emphasis on theory testing, structural equation modeling (SEM) offers the tools to specify a model that examines a series of relationships between constructs. The Crossroads Study includes a broad range of constructs, many with multiple indicators, which allows for the formation of latent variables. Latent variables represent hypothetical constructs that are formed using a number of observed variables. Rather than simply summing or using the mean of items to create a score, latent variables are formed by accounting for the variation and covariation between a set of observed variables. Specifically, the variance of each observed variable is considered in terms of common variance, or the variance shared with other items that is accounted for by the latent variable, and unique variance, which considers variance specific to the item and measurement error of the item. Creating latent variables permits assessment of measurement properties as well as quantification of

associations between them that are free from measurement error. Moreover, response categories (e.g., 5-point Likert-type scale) for individual indicators of a given latent construct do *not* have to be same (Brown, 2015).

In addition to latent constructs, observed variables and single-indicator latent constructs are employed in the present study. Observed variables refer to the actual score on a given measure and can be continuous or categorical variables. To reduce model complexity and the likelihood of estimation difficulties, single-indicator latent variables with reliability adjustment were used for all control variables that are measured with multiple indicators, and used for all latent constructs in the multigroup model. In these cases, the factor loading of the indicator was fixed at 1 and the error variance was set: $(1 - \text{reliability}) * \text{sample variance}$.

In SEM, observed and latent variables are either endogenous or exogenous variables. Endogenous variables are constructs that are predicted by one or more constructs in the model. The causes of exogenous variables are not predicted in the model and these constructs are solely used to predict endogenous variables (Kline, 2016). The following sections detail the endogenous and exogenous variables used in the present study. Alphas are presented for latent variables to demonstrate scale reliabilities, however, detailed measurement strategies and fit statistics are presented in the analytic strategy and results sections, respectively.

Endogenous Variables

Ten endogenous variables serve as either mediators or outcomes: school bond (attachment, commitment, involvement, and belief), school misconduct, delinquency, school exclusion, dropout, employment, romantic relationships, secondary education,

offending, and incarceration. Four latent variables will be used to measure the school bond at wave one: attachment, commitment, involvement, and belief. In order to most closely match Hirschi's (1969) original four bond constructs and remain consistent with prior assessments of school bond, items were selected across several scales in the Crossroads Study: School Bonding and School Orientation, Evaluation of School, School Performance and Extracurriculars, EPOCH (Engagement, Perseverance, Optimism, Connectedness, and Happiness), and the Psychosocial Maturity Inventory (PSMI). The School Bonding and School Orientation scale was created using Cernkovich and Giordano's (1992) attachment and commitment scales. Items from the Evaluation of School scale were adapted from Gibbs (1991) to create unique measures for the Crossroads Study to measure several educational domains: activity, assistance, support, certainty, monitoring, and safety. School Performance and Extracurriculars measures participants' involvement in a variety of school activities and was created for the Crossroads Study. The EPOCH (Engagement, Perseverance, Optimism, Connectedness, and Happiness) scale was developed for the Pathways to Desistance Study (Schubert et al., 2004) to measure adolescents' psychological well-being. Finally, the PSMI (Psychosocial Maturity Inventory) is a 30-item scale that measures maturity (Greenberger et al., 1974).²

School bond.

Attachment. A 12-item single-factor latent construct measures attachment to school ($\alpha = 0.89$). Items are measured on a five-point Likert scale ranging from "Strongly

² Though many items were considered in the creation of latent constructs, constructs that demonstrated poor model fit, were assessed and where theoretically justifiable, poor-fitting items were removed (Kline, 2016). The models were then respecified and reassessed for fit, and only the items included in the final models are presented in this section.

Disagree” (1) to “Strongly Agree” (5). Participants were asked to rate the degree in which they agreed with the following: “I like my teachers; When I have a problem, someone there will help me; There is a grownup there who gives me advice; Someone there pays attention to what I do most of the time; The grown-ups there don’t really care about me (reverse coded); I don’t have anyone there who I can ask for help (reverse coded); I feel close to people there; I feel like the grown-ups there will protect me; If I am not sure what to do, there is someone there I can ask; Someone keeps a close eye on me there; Someone there cares about whether I succeed; I feel like I am a part of that school.”

Commitment. A five-item single-factor latent construct measures commitment to school ($\alpha = 0.76$). Four items are measured on a five-point Likert scale ranging from “Strongly Disagree” (1) to “Strongly Agree” (5). Participants were asked to rate the degree in which they agreed with the following: “Getting good grades is not important to me (reverse coded); I try hard at school; Schoolwork is very important to me; I wish I could drop out of school (reverse coded).” One item is measured on a five-point Likert scale ranging from “Not at All” (1) to “Very Much” (5): “I keep at my schoolwork until I am done with it.”

Involvement. Involvement is measured as a single-indicator latent construct ($\alpha = 0.40$).³ Eight extracurricular activities were used to create an involvement scale, which averaged responses across the eight items and represents the average number of days per week per activity. The scale’s reliability was used to form the single-indicator latent

³ A single-factor latent construct was also considered. The single-factor latent construct demonstrated poor fit $\chi^2(20) = 138.924, p = .000, RMSEA = 0.073, CFI = 0.737, TLI = 0.631$. In order to maintain the inclusion of all activities, an involvement scale was created to form the single-indicator latent construct. While the scale reliability was low, this is not necessarily unexpected, as it may be that involvement in one activity may preclude involvement in another.

construct. Participants were asked, “How many days a week (0-7) do you spend on the following activities outside of class time?”: “Student Government; Athletic Teams; Cheerleading or other sport-related team (such as drill team or pep squad); Music/band; School clubs (hobby, service, recreational); National Honor Society; Newspaper/yearbook; Attending athletic events, plays or school dances; Other extracurricular school activities.”

Belief. A three-item single-factor construct measures belief in school rules ($\alpha = 0.59$). Items are measured on a five-point Likert scale ranging from “Strongly Disagree” (1) to “Strongly Agree” (5). Participants were asked to rate the degree in which they agreed with the following: “The rules are fair; I know what will happen to me if I break the rules; There is a clear set of rules I am supposed to follow.”

School misconduct, school exclusion, and dropout.

School misconduct. School misconduct is based on an existing school misbehavior scale (Eccles et al., 1998; $\alpha = 0.68$). A six-item single-factor latent construct measures school misconduct. Using a Likert-type scale ranging from “Not at all” (1) to “Often/many times” (4), participants were asked how often they: “Skip school without permission; Gotten in trouble for disturbing the class; Purposely damaged school property; Been kicked out of class; Been sent to the principal’s office; Received detention.”

Delinquency. The Self-Report of Offending scale (Huizinga et al., 1991) is a 24-item scale that assesses a range of delinquent offenses. At each interview, participants were asked whether they: “Purposely destroyed or damaged property that did not belong to you; Purposely set fire to a house, building, car or vacant lot; Entered or broken into a

building to steal something; Stolen something from a store; Bought, received, or sold something that you knew was stolen; Used checks or credit cards illegally; Stolen a car or motorcycle to keep or sell; Sold marijuana; Sold other illegal drugs (cocaine, crack, heroin); Car-jacked someone; Driven while you were drunk or high; Been paid by someone for having sexual relations with them; Forced someone to have sex with you; Killed someone; Shot someone; Shot at someone where you were the one who pulled the trigger; Taken something from another person by force, using a weapon; Taken something from another person by force, without a weapon; Beaten up or physically attacked somebody so badly that they probably needed a doctor; Been in a fight; Beaten up, threatened, or physically attacked someone as part of a gang; Carried a gun; Entered or broken into a car to steal something from it; Gone joy-riding.” These items were dichotomized into engaging in a delinquent act (1) or not (0).⁴

School Exclusion. Two items are used to create an observed measure of school exclusion across waves three and four. Two time points are used to increase the likelihood that school exclusion will be observed, due to the possibility of low rates of school exclusion. Participants were asked whether they were suspended or expelled during the follow-up period. Each item is coded “Yes” (1) and “No” (0) and scores were dichotomized to indicate whether a participant experienced school exclusion (1) or not (0).

Dropout. Participants were asked whether they dropped out of school during the follow-up period (1) or not (0) to create an observed measure of dropout across waves

⁴ A single-factor latent construct, variety score, and dichotomized measure were each considered. The single-factor latent construct demonstrated poor fit $\chi^2(230) = 1347.469, p = .000, RMSEA = 0.065, CFI = 0.887, TLI = 0.876$. Ultimately, due to a large proportion of subjects not engaging in any delinquency at wave two (55.39%) and to select the most parsimonious measure, a dichotomized measure was utilized.

three and four. Similar to school exclusion, two time points are used to increase the likelihood that dropout is observed.

Social bonds near the transition to adulthood.

Employment. Employment is assessed at wave five as a single-item observed variable that describes whether a participant was employed during the recall period (1) or not (0). Employment is defined as having a paying job at any time during the recall period and includes both part-time and full-time employment.

Postsecondary education. Postsecondary education is assessed at wave five as a single-item observed variable that measures whether participants were enrolled in postsecondary education during the recall period (1) or not (0). Postsecondary education is defined as being enrolled in a vocational program, two-year university, four-year university, or graduate coursework.

Romantic relationship. Whether participants are in a romantic relationship is assessed at wave five as a single-item observed variable coded as yes (1) and no (0).

Adult offending and justice-system involvement.

Offending. Similar to wave two measurement of delinquency noted above, the 24-item Self-Report of Offending scale (Huizinga et al., 1991) is used to assess participation in a range of delinquent offenses at waves six and seven and is dichotomized as committing an offense (1) or not (0).

Incarceration. Incarceration is assessed at waves six and seven as a single-item observed variable that measures whether participants were incarcerated (1) or not (0). Incarceration is defined as: secure institution, locked facility, jail, or detention.

Exogenous Variables

Nine variables serve as predictors of school bond and, importantly, also as exogenous control variables when examining the study's focal relationships between the aforementioned endogenous variables. All exogenous variables are measured at baseline and collectively capture key constructs in developmental domains, including demographic, family, peer, and neighborhood constructs.

Age. Age is a continuous observed measure that captures participants' age in years.⁵

Race/ethnicity. Race/ethnicity indicates whether a participant is White (0), Black (1), Hispanic (2), or Other (3). It is represented as a series of dummy variables, with White serving as the reference group. Race is used as a covariate in the full model and as a grouping variable in the multigroup model.

Socioeconomic status. Parent's education level is used as a proxy for SES. This measure selects the highest parent's education level if information is available for both the mother and father, or selects a single parent's education level if only one parent's information is available. Education ranges from some grade school (1) to professional or graduate degree (10).

IQ. The Wechsler Abbreviated Scale of Intelligence (WASI; Wechsler, 1999) is used as an observed variable representing IQ. The Crossroads Study uses the Vocabulary and Matrix Reasoning scales from the WASI and summed scores are used to generate a percentile score based on the summed score and age. Prior studies have demonstrated

⁵ Age ranges at each time point are as follows: BL (13-17), T1 (13-18), T2 (14-19), T3 (14-19), T4 (15-20), T5 (15-20), T6 (16-21), T7 (17-22).

strong psychometric properties of the WASI when employed with an adolescent sample (Canivez et al., 2009; Ryan et al., 2003).

Grades in school. A single item is used to measure participants' grades in school. Participants were asked to describe their grades at their most recent school on an eight-point scale ranging from "Mostly below D's" (1) to "Mostly A's" (8).

Impulsivity. Eight items from the impulse control scale of the Weinberger Adjustment Inventory (WAI; Weinberger & Schwartz, 1990; $\alpha = 0.741$) are used to create a single-indicator latent variable measuring impulsivity at baseline. A five-point Likert scale was used with the following response options: "False" (1), "Somewhat False" (2), "Not Sure" (3), "Somewhat True" (4), and "True" (5), with higher scores indicating more impulsivity. Participants were asked to describe how well a series of items matched their behavior (e.g. "I say the first thing that comes into my mind without thinking enough about it").

Delinquent peers. Thirteen items are used to create a single-indicator latent variable measuring peer delinquency ($\alpha = 0.90$). Items are adapted from Thornberry and colleagues (1994) Delinquent Peers scale, which measures participant's number of friends who have engaged in a number of delinquent acts. Specifically, a five-point Likert scale ranging from "None of them" (1) to "All of them" (5) was used to assess how many friends have: "Purposely damaged or destroyed property that did not belong to them; Hit or threatened to hit someone; Sold drugs; Gotten drunk once in a while; Gotten high on drugs; Carried a knife; Carried a gun; Owned a gun; Gotten into a physical fight; Been hurt in a fight; Stolen something worth more than \$100; Taken a motor vehicle or stolen a car; Gone in or tried to go into a building to steal something."

Maternal attachment. A single-indicator latent construct was created to assess warmth of maternal relationships at baseline using an adaption of the Quality of Parental Relationships Inventory (Conger et al., 1994) created for the Crossroads Study ($\alpha = 0.88$). Using a four-point Likert-type scale ranging from “Always” (4) to “Never” (1), participants were asked how often their mother would: “Help you do something that was important to you; Let you know he/she really cares about you; Listen carefully to your point of view; Act supportive and understanding towards you; Act loving or affectionate towards you; Have a good laugh with you about something that was funny; Let you know that he/she appreciates you, your ideas, or the things you do; Tell you he/she loves you; Insult or swear at you; Understand the way you feel about things.”

Neighborhood disorganization. Neighborhood disorganization⁶ is measured as a single-indicator latent construct comprising of 21 items adapted from Sampson & Raudenbush (1999) to assess the physical and social disorder of the neighborhood ($\alpha = 0.94$). Items are measured on a 4-point Likert-type scale ranging from “Never” to “Often.” Participants were asked how often the following occurred in their neighborhood: “Cigarettes on the streets or in the gutters; Garbage on the streets or on the sidewalk; Empty beer bottles on the streets or sidewalks; Boarded up windows on buildings; Graffiti or tags; Graffiti painted over; Gang graffiti; Gangs (or other teen groups) hanging out; Abandoned cars; Empty lots with garbage; Condoms on the sidewalk; Needles or syringes; Political messages in graffiti; Adults hanging out on the street; People drinking beer, wine, or liquor; People drunk or passed out; Adults fighting or arguing loudly;

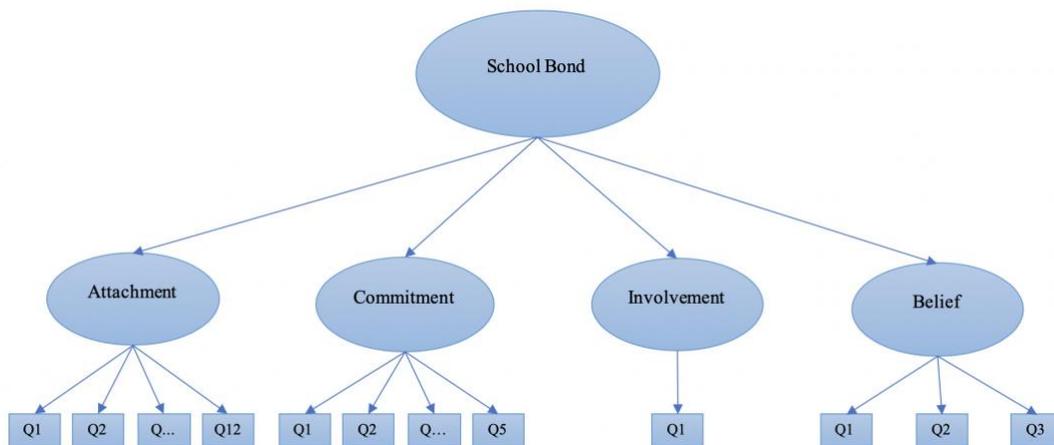
⁶ While criminological research lacks consensus on terminology related to this construct (e.g., disorder vs. incivilities; see Kubrin, 2008), the present study employs the term neighborhood disorganization throughout the text.

Prostitutes on the streets; People smoking marijuana; People smoking crack; People using needles or syringes to take drugs.”

Analytic Strategy

Using structural equation modeling with measurement and structural models, several steps were taken in order to build the final conceptual model, which was then assessed across race/ethnicity to compare White, Black, and Hispanic models. (1) Using the full sample, confirmatory factor analysis (CFA) was used to specify the relationship between observed items and one-factor latent constructs of attachment, commitment, belief, and school misconduct. Given prior use of school bond as a global construct (Ford, 2005; Hay et al., 2017; O’Donnell et al., 1995; Sabatine et al., 2017; Seddig 2016; Sprott et al., 2005), a higher-order measurement model was created for the school bond construct and its four dimensions (see Figure 2). (2) A saturated model with paths between all exogenous and endogenous variables assessed the overall fit of the model. (3) Next, a theoretical hybrid structural equation model assessed the hypothesized relationships between each construct. (4) Finally, a multigroup hybrid structural equation model using single-indicator latent variables was estimated to assess whether the structural relationships are equal across race/ethnicity.

Figure 2. Higher-Order Latent Factor of School Bond



Measurement Models

The constructs that are used in this study either come from preexisting scales in the Crossroads dataset and/or are measures that are supported by prior research. CFA was used to create each construct independently to ensure the items selected to measure each construct provide adequate fit prior to being introduced to the full structural model.

CFA is a measurement model that specifies which items (indicators) are related to specific latent constructs (factors). CFA describes how well a given measurement model fits the data and is able to account for measurement error by adjusting for shared variance among items in a given factor. In order to specify a CFA model, each latent variable must be assigned a scale. That is, as latent variables are unobserved, they must be assigned a unit of measurement. One strategy, unit variance identification (UVI), standardizes the latent variables by fixing the variance of the latent variables to 1.00. This strategy produces a standardized and a completely standardized solution. Another strategy is to select a reference indicator and fix the unit of measurement of the latent variable to be equal to this indicator, known as a unit loading identification (ULI) constraint. Here, the

sample variance of the indicator is used to estimate the factor variance. This strategy produces an unstandardized solution and a completely standardized solution. ULI is more appropriate when analyzing a SEM across multiple groups, or when analyzing a construct across multiple waves (Kline, 2016). As both of these conditions are met in the present analysis, ULI will be used to scale latent constructs. A higher-order factor analysis will assess whether a broader dimension of school bond can be created from attachment, commitment, involvement, and belief. Higher-order factor analyses allow for a more parsimonious account of the correlations between lower-order factors (Brown, 2015).

CFA model fit was assessed using the root mean square error of approximation (RMSEA; Steiger & Lind, 1980), comparative fit index (CFI; Hu & Bentler, 1998), and the Tucker-Lewis index (TLI; Tucker & Lewis, 1973). These tests indicate how well a measurement model fits the data. The RMSEA evaluates how well a model fits reasonably well in the population, where a zero value indicates perfect fit and values close to zero denote good model fit (Brown, 2015). Specifically, scores near or below 0.06 suggest an adequate fit to the data (Hu & Bentler, 1999), but scores near 0.08 indicate reasonable fit (Acock, 2013). CFI compares the theoretical model to a null model, which assumes no relationship between the items. CFI values range from zero to one, where scores close to one suggest good model fit. TLI is similar to CFI, but accounts for model complexity by assigning lower scores to models that include freely estimated parameters that do not improve model fit. Values of TLI can fall above one, but values close to one signal good model fit (Brown, 2015). Specifically, for both CFI and TLI, scores near or above 0.95 indicate good model fit (Hu & Bentler, 1999), but values between 0.90 and 0.95 suggest reasonable model fit (Bentler, 1990).

As stated above, single-indicator latent variables with reliability adjustment were used for all control variables that are latent constructs to reduce model complexity and the likelihood of estimation difficulties. For these variables, a single-item was created using a scale score (e.g., mean of the items) and the reliability was obtained via Chronbach's alpha. The factor loading of the indicator was fixed at 1 and the error variance was set: $(1 - \text{reliability}) * \text{sample variance}$.

Hybrid SEM

Figure 1 details the conceptual model. Unlike measurement models, structural models specify direction between variables. Once an adequate fit for all latent variables was established individually, a saturated structural model with paths between all exogenous and endogenous variables was created. This model specified additional structural relationships that were not hypothesized in order to estimate all paths between variables. To ensure that the theoretical model is a good fitting, parsimonious model, decrement of fit was assessed by nesting the theoretical model (i.e., the model that constrains non-hypothesized pathways to zero) in the saturated model (i.e., the model that estimates all paths between variables). In moving from the saturated structural model to the theoretical model, the theoretical model fit was assessed using the chi-square test of decrement of fit, as well as RMSEA, CLI, and TLI statistics (Kline, 2016). Hypothesized pathways that were statistically insignificant were kept in the model so these variables could maintain their role in adjusting for confounding.

Observed variables, which are depicted as rectangles in the figure, are assumed to be measured without error. Latent variables, depicted as ovals, are adjusted for measurement error through CFA processes described above. Regarding Research

Question 1, the baseline covariates indicate hypothesized predictors of school bonds at T1. Regarding Research Question 2, the direct effects between school bonds at wave one, school misconduct and delinquency at wave two, and school exclusion and dropout at waves three/four were assessed, as were the direct effects between school misconduct and delinquency at wave two and school exclusion and dropout at waves three/four. It was hypothesized that individuals who have stronger bonds to school are less likely to be delinquent, will engage in less school misbehavior, and will be less likely to be excluded from school. Indirect effects were assessed in pathways with joint significance.

Regarding Research Question 3, school exclusion and dropout during waves three/four were predicted to have deleterious consequences for later social bonds during wave five. In particular, those who have been excluded from school or have dropped out were expected to be less likely to have romantic relationships, be employed, and/or be pursuing or have completed postsecondary education. Further, the effect of school exclusion and dropout at waves three/four on offending and incarceration at waves six/seven were assessed. It was expected that youth who have experienced school exclusion and/or dropout would be more likely to continue offending and/or be incarcerated in young adulthood. Where appropriate, indirect effects were also assessed.

While not of central focus to the present study, an alternative modeling approach estimating cross-lagged effects to examine possible reciprocal relationships between key constructs was performed. As argued by Thornberry's (1987; see also Thornberry & Krohn, 2005) interactional theory, bonds and delinquency may have a reciprocal relationship across the life course; while weak bonds may contribute to increased delinquency, engaging in crime may also cause bonds to further weaken (see also Liska

& Reed, 1985 and Liljeberg et al., 2011 for discussion of reciprocal effects). While the exploration of cross-lagged effects between key constructs is a critical area of study, the research questions at hand, the focus on understanding how these key constructs may unfold as a process, and the need for a theoretically-grounded investigation of the school-to-prison pipeline are better addressed with a structural model that takes a focused approach to examining causes and effects at specific time points. However, to provide empirical support for (or against) the proposed model in terms of directionality and strength of the hypothesized relationships, multiple two-wave cross-lagged panel models were assessed and are detailed in Appendix D. These supplemental analyses will establish whether the proposed directionality of the structural model is justified; if it is not, future research should consider alternative relationships.

Multigroup Model

Multigroup modeling allows measurement and structural equivalence across groups to be assessed. Differences in measurement may stem from:

- (a) respondents embracing different cultural values who interpret a given measure in a conceptually different manner; (b) gender, ethnic, or other individual differences that entail responding to instruments in systematically different ways; and (c) respondents who use the available options on a scale differently (e.g., tendency to choose or not to choose the extremes). (Hair et al., 2018, p. 139-140)

Multigroup CFA modeling allows for the comparison of measurement invariance across groups (Brown, 2015). For ordinal indicators, this means that “the probability of selecting a particular response option is the same across groups, given the same standing on the common factor that corresponds to that item” (Kline, 2016, p. 411).

Measurement invariance is tested by estimating configural invariance, metric invariance, and scalar invariance models. Configural invariance models test whether the

same indicator variables can be used to form latent constructs across groups (Vandenberg & Lance, 2000). To test this, factor loadings and item intercepts are freely estimated, factor means are fixed to zero and factor variances are fixed to one for identification in each group. Metric invariance models build on configural models by testing whether the relationships between indicator variables and latent variables are equal across groups (Vandenberg & Lance, 2000). In these models, factor variances are freely estimated in comparison groups, and factor loadings are constrained to be equal across all groups. Finally, scalar invariance models test whether mean levels of latent constructs are equal across groups (Vandenberg & Lance, 2000) by freely estimating factor means in comparison groups, and constraining intercepts to be equal across groups.

While measurement invariance is important to establish prior to assessing structural differences because it ensures that differences in structural relationships are not a result of distinct differences in the measurement properties of variables across groups, I chose to create single-indicator latent constructs to reduce model complexity and the likelihood of estimation difficulties in the multigroup model. In doing so, each race/ethnicity model was constrained to be identical in measurement, and structural equivalence across groups was examined by comparing path coefficients across groups (Kline, 2016) to address Research Question 4. Though full latent constructs were not used in the multigroup model, supplemental analyses concerning the equality in the measurements of latent constructs across race are presented in Appendix D.

Missing Data

Missing data is a common issue in panel studies due to attrition. In the Crossroads data, however, participant retention was high, ranging from 95.56% completed interviews

at wave 1 to 86.60% completed interviews at wave 7. Weighted least squares means and variance (WLSMV) estimation was used in the present study, which employs pairwise deletion methods for missing data. Pairwise deletion maintains a larger proportion of the sample in analyses, compared to listwise deletion, and produces unbiased estimates for parameters and their standard errors (Asparouhov & Muthén, 2010).

CHAPTER 4 – RESULTS

The following chapter presents the findings for each of the four research questions. First, descriptive statistics are presented. Next, measurement models detailing the analyses for latent constructs, including model fit, are presented. With respect to research questions one through three, the results of the hybrid SEM are presented, which include the decomposition of indirect effects where appropriate. Lastly, the results of the multigroup model are presented in relation to research question four.

Item numbers in the tables correspond to the item order as presented in the text of the measures section, and are included below to aid readability.

School Bond (4 sub-factors)

1=Attachment

- 1=When I have a problem, someone there will help me.
- 2=There is a grown-up there who gives me advice.
- 3=Someone there pays attention to what I do most of the time.
- 4=I feel close to people there.
- 5=I feel like the grown-ups there will protect me.
- 6=If I am not sure what to do, there is someone there I can ask.
- 7=Someone keeps a close eye on me there.
- 8=Someone there cares about whether I succeed.
- 9=I feel like I am a part of that school.
- 10=The grown-ups there don't really care about me (reverse coded).
- 11=I don't have anyone there who I can ask for help (reverse coded).
- 12=I like my teachers.

2=Commitment

- 1=Getting good grades is not important to me (reverse coded).
- 2=I try hard at school.
- 3=Schoolwork is very important to me.
- 4=I wish I could drop out of school (reverse coded).
- 5=I keep at my schoolwork until I am done with it.

3=Belief

- 1=The rules are fair.
- 2=I know what will happen to me if I break the rules.
- 3=There is a clear set of rules I am supposed to follow.

4=Involvement

School Misconduct

- 1=Skip school without permission.
- 2=Gotten in trouble for disturbing the class.
- 3=Purposely damaged school property.
- 4=Been kicked out of class.
- 5=Been sent to the principal's office.
- 6=Received detention.

Descriptive Statistics

Table 2 presents the descriptive statistics for endogenous variables. Four constructs were created from individual items to measure a global school bond: attachment, commitment, belief, and involvement. Attachment comprised of 12 items on a five-point Likert scale, with item means ranging from 3.61 to 4.00. Commitment was created using five items on a five-point Likert scale, with item means ranging from 3.56 to 4.31. Belief was constructed of three items on a five-point Likert scale, with means ranging from 3.55 to 4.20. Lastly, youth's daily involvement in afterschool activities, averaged 0.31. These means indicate that, on average, youth had fairly strong attachment, commitment, and belief, but were involved in few extracurriculars.

School misconduct was measured using five items on a four-point Likert-type scale, with means ranging from 1.09 to 1.69, indicating that on average, youth engaged in low levels of misbehavior at school. Turning to the remaining endogenous variables, all of which were observed dichotomous measures, 45% of youth engaged in delinquency at wave two; 21% experienced school exclusion and 10% dropped out between waves three and four; 54% were employed, 11% were enrolled in postsecondary education, and 30% were in a romantic relationship at wave five; 47% committed an offense and 17% were incarcerated during waves six and seven.

Table 2. Descriptive Statistics: Endogenous Variables

| Variable | n | Mean | S.D. | Min | Max |
|-------------------------|----------|-------------|-------------|------------|------------|
| School Bond | | | | | |
| Attachment | | | | | |
| Item 1 | 1119 | 3.81 | 0.90 | 1.0 | 5.0 |
| Item 2 | 1120 | 3.84 | 0.95 | 1.0 | 5.0 |
| Item 3 | 1120 | 3.78 | 0.93 | 1.0 | 5.0 |
| Item 4 | 1120 | 3.54 | 1.05 | 1.0 | 5.0 |
| Item 5 | 1120 | 3.58 | 0.99 | 1.0 | 5.0 |
| Item 6 | 1120 | 3.95 | 0.79 | 1.0 | 5.0 |
| Item 7 | 1120 | 3.69 | 0.95 | 1.0 | 5.0 |
| Item 8 | 1119 | 4.00 | 0.85 | 1.0 | 5.0 |
| Item 9 | 1120 | 3.68 | 1.04 | 1.0 | 5.0 |
| Item 10 | 1120 | 3.84 | 0.87 | 1.0 | 5.0 |
| Item 11 | 1120 | 4.00 | 0.85 | 1.0 | 5.0 |
| Item 12 | 1059 | 3.61 | 0.94 | 1.0 | 5.0 |
| Commitment | | | | | |
| Item 1 | 1070 | 4.20 | 0.80 | 1.0 | 5.0 |
| Item 2 | 1070 | 3.92 | 0.82 | 1.0 | 5.0 |
| Item 3 | 1069 | 3.88 | 0.85 | 1.0 | 5.0 |
| Item 4 | 1068 | 4.31 | 0.94 | 1.0 | 5.0 |
| Item 5 | 1007 | 3.56 | 1.19 | 1.0 | 5.0 |
| Belief | | | | | |
| Item 1 | 1120 | 3.55 | 1.02 | 1.0 | 5.0 |
| Item 2 | 1120 | 4.09 | 0.80 | 1.0 | 5.0 |
| Item 3 | 1120 | 4.20 | 0.66 | 1.0 | 5.0 |
| Involvement | 1129 | 0.31 | 0.44 | 0.0 | 2.6 |
| School Misconduct | | | | | |
| Item 1 | 1086 | 1.69 | 1.02 | 1.0 | 4.0 |
| Item 2 | 1084 | 1.67 | 0.85 | 1.0 | 4.0 |
| Item 3 | 1084 | 1.09 | 0.37 | 1.0 | 4.0 |
| Item 4 | 1084 | 1.34 | 0.72 | 1.0 | 4.0 |
| Item 5 | 1083 | 1.28 | 0.59 | 1.0 | 4.0 |
| Delinquency | 1141 | 0.45 | | 0.0 | 1.0 |
| School Exclusion | 1061 | 0.21 | | 0.0 | 1.0 |
| Dropout | 1162 | 0.10 | | 0.0 | 1.0 |
| Employment | 1122 | 0.54 | | 0.0 | 1.0 |
| Postsecondary Education | 1123 | 0.11 | | 0.0 | 1.0 |
| Romantic Relationship | 1122 | 0.30 | | 0.0 | 1.0 |
| Offending | 1140 | 0.47 | | 0.0 | 1.0 |
| Incarceration | 1145 | 0.17 | | 0.0 | 1.0 |

Note: For latent variables, the item number corresponds to item order as presented in the text of the Measures and Results sections.

Table 3 presents the descriptive statistics for exogenous variables. The sample was demographically diverse. Fifteen percent of the youth were White, 37% were Black, 46% were Hispanic, and 2% identified as other race. At baseline, youth averaged 15.29 years old, ranging from 13-18.⁷ Socioeconomic status was measured using parent education as a proxy. Most youth indicated that their parents completed high school or the GED equivalent (34.73%). About 27% of youths' parents did not complete high school, and about 38% indicated that their parents had some education above a high school degree. IQ, which uses the WASI percentile rank as a proxy, indicates that on average, youth demonstrate average intelligence. About 3% of participants reported receiving mostly A grades at baseline, about 67% indicated they received between mostly Cs and half Bs/half As, about 24% reported that they received between mostly Ds and half Cs/half Ds, and about 7% received mostly below Ds. Most youth reported engaging in delinquency in the six months prior to the baseline interview (64%). The remaining exogenous variables were represented as single-indicator latent constructs. The average impulsivity score was 2.00, indicating that on average, youth demonstrated strong impulse control. On average, youth reported few delinquent peers, with a mean of 1.74. Youth indicated that, on average, they had a moderately strong attachment to their mothers, with a mean of 3.21. Finally, the average score for neighborhood disorganization was 2.07, indicating that on average, youth experienced low levels of neighborhood disorganization.

⁷ Only one youth was 18 when the baseline interview was completed.

Table 3. Descriptive Statistics: Exogenous Variables

| Variable | n | Mean | S.D. | Min | Max |
|---------------------------|----------|-------------|-------------|------------|------------|
| Race | 1216 | | | | |
| White | | 0.15 | | 0.0 | 1.0 |
| Black | | 0.37 | | 0.0 | 1.0 |
| Hispanic | | 0.46 | | 0.0 | 1.0 |
| Other | | 0.02 | | 0.0 | 1.0 |
| Age | 1216 | 15.29 | 1.29 | 13.0 | 18.0 |
| SES | 1166 | 5.33 | 2.14 | 1.0 | 10.0 |
| Some Grade School | | 0.04 | | | |
| Finished Grade School | | 0.04 | | | |
| Some High School | | 0.20 | | | |
| GED | | 0.02 | | | |
| High School Diploma | | 0.33 | | | |
| Business/Trade School | | 0.03 | | | |
| Some College/2 Year | | | | | |
| Degree | | 0.18 | | | |
| Four Year Degree | | 0.13 | | | |
| Some Grad./Prof. School | | 0.02 | | | |
| Professional/Grad. Degree | | 0.03 | | | |
| IQ | 1215 | 26.96 | 21.40 | 0.1 | 97.0 |
| Grades | 1176 | 4.46 | 1.73 | 1.0 | 8.0 |
| Mostly Below Ds | | 0.07 | | | |
| Mostly Ds | | 0.06 | | | |
| Half Cs/Half Ds | | 0.18 | | | |
| Mostly Cs | | 0.15 | | | |
| Half Bs/Half Cs | | 0.30 | | | |
| Mostly Bs | | 0.10 | | | |
| Half Bs/Half As | | 0.12 | | | |
| Mostly As | | 0.03 | | | |
| Impulsivity | 1216 | 2.00 | 0.86 | 1.0 | 5.0 |
| Delinquent Peers | 1211 | 1.74 | 0.67 | 1.0 | 5.0 |
| Maternal Attachment | 1200 | 3.21 | 0.65 | 1.0 | 4.0 |
| Neighborhood Disorg. | 1216 | 2.07 | 0.68 | 1.0 | 4.0 |

Measurement Models

Table 4 displays the standardized factor loadings for the endogenous latent variables of attachment, commitment, belief, and school misconduct. As detailed in the table, all items reached statistical significance when loading onto their corresponding factor. In addition, all items loaded above 0.40, which is considered a salient factor loading (Brown, 2015). All models were estimated using Mplus v. 7.31 (Muthen & Muthen, 1998-2017) and weighted least squares means and variance (WLSMV) estimation. Below, goodness-of-fit statistics are presented for each latent construct (Table 5).

Attachment

Several of the items originally proposed were dropped from the CFA model for attachment: “Most of my teachers treat me fairly; I care what my teachers think of me; I like school; I feel like the grown-ups there will protect me; I feel as if I really don’t belong at school.” As noted by Brown (2015), a better-fitting model can often be obtained by dropping bad indicators from the model. In exploring this, indicators with the poorest loadings were removed one at a time until doing so no longer substantially improved model fit.

In the final model, twelve items were used as indicators for a single-factor model of attachment. These indicators had a range of scores from 1 to 5, with higher scores reflecting higher levels of attachment to school. Item 1 was used as a marker indicator for attachment. Goodness of fit was evaluated by using the RMSEA, CFI, and TLI. Two of the three overall goodness-of-fit indices suggested that the model achieved adequate model fit: $\chi^2(66) = 14496.02, p = .000, RMSEA = .17, CFI = .92, TLI = .90$. While

Table 4. Standardized Factor Loadings on Latent Constructs

| Item | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|-------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|-----------|-----------|
| School Bond | 0.85 | 0.68 | 0.87 | 0.30 | | | | | | | | |
| Attachment | 0.81 | 0.77 | 0.67 | 0.65 | 0.72 | 0.83 | 0.60 | 0.79 | 0.70 | 0.75 | 0.70 | 0.59 |
| Commitment | 0.70 | 0.80 | 0.83 | 0.64 | 0.55 | | | | | | | |
| Belief | 0.72 | 0.77 | 0.78 | | | | | | | | | |
| School Misconduct | 0.51 | 0.73 | 0.81 | 0.84 | 0.79 | 0.45 | | | | | | |

Note: All factor loadings significant at $p < .001$. For latent variables the item number corresponds to the item order as presented in the text of the Measures and Results sections.

Table 5. Model Fit Statistics for Latent Constructs

| | χ^2 | df | RMSEA | CFI | TLI |
|-------------------|----------|-----|-------|------|------|
| School Bond | 23427.05 | 210 | 0.08 | 0.94 | 0.93 |
| Attachment | 14496.02 | 66 | 0.14 | 0.92 | 0.90 |
| Commitment | 5061.27 | 10 | 0.14 | 0.98 | 0.95 |
| Belief | --- | --- | --- | --- | --- |
| School Misconduct | 2073.27 | 15 | 0.06 | 0.98 | 0.97 |

Note: As belief consists of three items, the model fits perfectly and fit statistics are not informative.

RMSEA indicated poor fit, both CFI and TLI indicated reasonable model fit. To preserve content validity, the final model was retained despite less than optimal fit.

Commitment

Originally, thirteen variables from three separate scales were considered to measure commitment. However, many of the items from the PSMI scale did not load strongly. Upon further examination, it was clear that the majority of the items from the PSMI (e.g., If something more interesting comes along, I will usually stop any work I'm doing (reverse coded); I hate to admit it, but I give up on my work when things go wrong (reverse coded); I hardly ever get behind on my work; I often don't finish the work that I start (reverse coded) were not schoolwork-specific, and likely measured a dimension other than school commitment. As such, PSMI items were dropped from the model. The remaining items were evaluated for fit, and two additional items: "Homework is a waste of my time (reverse coded); When I am there, I think about getting out a lot (reverse coded)" were removed due to poor loading. Removing additional items did not substantially improve model fit.

In the final model, five items were selected as indicators for a single-factor model of commitment. These indicators had a range of scores from 1 to 5, with higher scores reflecting higher levels of commitment to school. Item 1 was used as a marker indicator.

Two of the three goodness-of-fit indices demonstrated good model fit: $\chi^2(10) = 5061.27$, $p = .000$, RMSEA = 0.14, CFI = 0.98, TLI = 0.95. Though RMSEA indicated poor fit, both CFI and TLI indicated good model fit and the final model was retained to preserve content validity.

Belief

Three items were selected as indicators for a single-factor model of belief. These indicators had a range of scores from 1 to 5, with higher scores reflecting higher levels of belief in school rules. Item 1 was used as a marker indicator. This model is just-identified, meaning that the parameter estimates perfectly fit the model, with zero degrees of freedom (Brown, 2015). As such, fit statistics are not informative for this three-item construct.

Involvement

A single-indicator latent variable was created for involvement. Measurement error is accounted for in a single-item latent variable by fixing its factor loading to one and its unstandardized error to a value calculated by using the scale's reliability: $(1 - \text{reliability}) * \text{sample variance}$ (Brown, 2015). Scale reliability among the eight items was .40. While this indicates poor scale reliability, this is not unexpected as participating in one activity may limit youths' ability to participate in other activities, thus limiting the relationship between extracurriculars.

School Bond

The latent measures of attachment, commitment, belief, and involvement, described above, were used as indicators for a higher-order model of school bond. A higher-order model was created to allow for a more parsimonious account of the

relationships among the structural model. Attachment was used as a marker indicator.

Each of the goodness-of-fit indices suggested that the model achieved adequate fit:

$\chi^2(210) = 23427.05$, $p = .000$, RMSEA = 0.08, CFI = 0.94, TLI = 0.93. As this model did not achieve optimal fit standards, the factor loadings were assessed. I explored whether removing involvement, which demonstrated a poor loading (0.40), improved the overall fit. Removing involvement caused the model to fit worse: $\chi^2(190) = 22615.96$, $p = .000$, RMSEA = 0.09, CFI = 0.93, TLI = 0.92. Therefore, all four bond elements were retained in the final higher-order model of school bond.

School Misconduct

Nine items that were originally considered as measures of school misconduct were dropped from the final model due to poor loading scores and poor overall model fit: “I was late for school; I cut or skipped classes; I was absent from school; I got in trouble for missing too many days; I had to go to truancy court; Come to class late; Copied homework or a class assignment off somebody else; Cheated on a test; Gotten into fights at school.” In examining the items that were removed from the final construct, many of them concern truancy behaviors, which may operate as a factor separate from school misconduct.

In the final model, six items were selected as indicators for a single-factor model of school misbehavior. These indicators had a range of scores from 1 to 4, with higher scores reflecting more school misbehavior. Item 1 was used as a marker indicator. Each of the overall goodness-of-fit indices indicated good model fit: $\chi^2(15) = 2073.267$, $p = .000$, RMSEA = 0.063, CFI = 0.981, TLI = 0.968.

Exogenous Single-Indicator Latent Variables

Single-indicator latent variables were created for impulsivity, peer delinquency, maternal attachment, and neighborhood disorder. As stated above, measurement error is accounted for in a single-item indicator by fixing its factor loading to one and fixing its unstandardized error to a value calculated by using the scale's reliability: $(1 - \text{reliability}) * \text{sample variance}$ (Brown, 2015). Scale reliability for impulsivity was .75, for peer delinquency was .90, for maternal attachment was .88, and for neighborhood disorder was .94.

Hybrid SEM

A saturated structural model with directional paths between all exogenous and endogenous variables was estimated in order to distinguish whether including non-hypothesized paths provided a better fit to the model. Each of the overall goodness-of-fit statistics demonstrated acceptable model fit: $\chi^2(823) = 2497.408$, $p = .000$, RMSEA = 0.042, CFI = 0.941, TLI = 0.927. Chi-square difference testing was performed using the “difftest” option in Mplus, which scales chi-square difference statistics for WLSMV models. This test nests the more parsimonious theoretical model, which constrains non-hypothesized paths to zero, in the model with all paths estimated. The difference test indicated that the theoretical model fit no worse than the saturated structural model: $\chi^2(15) = 19.533$, $p = 0.191$. Therefore, no additional paths were added, as the theoretical model is preferred on the basis of parsimony.

Tables 6 and 7 present the results of the theoretical model.^s Standardized effects are reported in the text, unless otherwise stated. For dummy variables, STDY is used, and

^s Standardized direct effects of exogenous variables on endogenous variables are presented in Appendix A.

for continuous variables STDYX is used.⁹ Overall, the theoretical model demonstrated adequate model fit: $\chi^2(838) = 2460.717$, $p = 0.000$, RMSEA = 0.041, CFI = 0.942, TLI = 0.930. Although the CFI and TLI were not above .95, as stated previously, values between 0.90 and 0.95 indicate reasonable model fit (Bentler, 1990). In comparing the theoretical model to the saturated model, both the chi-square difference test and the slight improvement in fit indices in the theoretical model indicate that no additional (non-hypothesized) pathways would improve model fit. Regarding model trimming, hypothesized pathways that were statistically insignificant were kept in the model so these variables could maintain their role in adjusting for confounding.

Table 6 details the direct effects of each exogenous covariate on school bond and answers the first research question, which asks what factors contribute to weak school bonds. Net of other factors, five relationships reached statistical significance and supported hypotheses related to research question one.¹⁰ As hypothesized, individuals who have better grades in school (H1d) are more likely to have a strong bond to school ($b = 0.228$, $SE = 0.034$, $p = 0.000$). In addition, youth with more delinquent peers (H1f) have a weaker bond to school ($b = -0.130$, $SE = 0.042$, $p = 0.002$). Attachment to mothers (H1g) is positively associated with school bond ($b = 0.274$, $SE = 0.033$, $p = 0.000$). Lastly, juveniles who reported higher neighborhood disorganization (H1h) were less likely to form strong bonds to school ($b = -0.095$, $SE = 0.040$, $p = 0.018$).

⁹ Mplus produces several standardized solutions. STDY standardizes using the variances of the observed variables and STDYX uses the variances of both the latent and the observed variables (Kelloway, 2015).

¹⁰ Bivariate tests demonstrated that all exogenous variables except age and SES were related to school bond.

Table 6. Unstandardized and Standardized Direct Effects of Exogenous Variables on School Bond

| | Unstd b | Std b | SE | <i>p</i> |
|----------------------|----------------|--------------|-----------|-----------------|
| Black | 0.24 | 0.20 | 0.11 | 0.07 |
| Hispanic | 0.04 | 0.04 | 0.11 | 0.74 |
| Other | -0.19 | -0.16 | 0.25 | 0.52 |
| Age | 0.00 | 0.00 | 0.03 | 0.94 |
| SES | -0.02 | -0.03 | 0.04 | 0.37 |
| IQ | -0.00 | -0.07 | 0.04 | 0.05* |
| Grades | 0.16 | 0.23 | 0.03 | 0.00*** |
| Impulsivity | -0.08 | -0.06 | 0.04 | 0.17 |
| Delinquent Peers | -0.17 | -0.13 | 0.04 | 0.00* |
| Mother Attachment | 0.36 | 0.27 | 0.03 | 0.00*** |
| Neighborhood Disorg. | -0.12 | -0.10 | 0.04 | 0.02* |

Note: STDY reported for binary variables, STDXY reported for continuous variables.
 $p < .05^*$, $p < .01^{**}$, $p < .001^{***}$

Attachment to mothers and grades exhibited the strongest effects on school bond. Specifically, a one standard deviation increase in maternal attachment leads to a 0.27 standard deviation increase in school bond, and a one standard deviation increase in grades results in a 0.23 standard deviation increase in school bond. Against expectations, a higher IQ predicted a lower bond to school ($b = -0.072$, $SE = 0.037$, $p = 0.051$). The remaining covariates—race, age, socioeconomic status, and impulsivity—did not significantly affect youths' bonds to school. The results indicate that approximately 20.8% of the variation in school bond is explained by the exogenous factors.

Table 7 details the direct effects between endogenous variables, relative to research question two, which asks what are the direct and indirect effects of school bond on school misbehavior, delinquency, school exclusion, and dropout; and research question three, which asks how the cumulative effects of negative school experiences affect young adult roles (romantic relationships, postsecondary education, and

employment), offending, and incarceration in young adulthood. Regarding research question two, six relationships reached statistical significance. Youth with stronger bonds to school were less likely to engage in school misconduct (H2a; $b = -0.182$, $SE = 0.043$, $p = 0.000$), and delinquency (H2b; $b = -0.173$, $SE = 0.047$, $p = 0.000$). Specifically, a 1-standard-deviation increase in school bond was associated with a 0.182-standard-deviation decrease in school misbehavior. For each standard deviation increase in school bond, the odds of engaging in delinquency decreased by 25%.¹¹ School bond did not predict school exclusion or dropout.

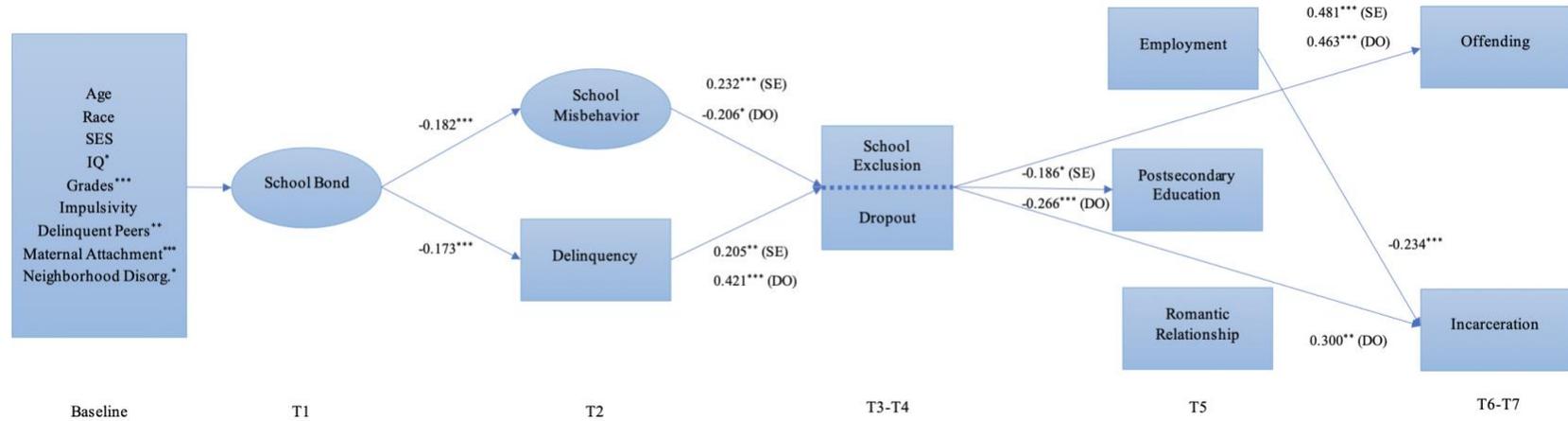
School misbehavior was positively related to school exclusion (H2e; $b = 0.232$, $SE = 0.066$, $p = 0.000$). For each standard deviation increase in school misbehavior, the odds of experiencing school exclusion increased by approximately 120%. Contrary to expectations, school misbehavior was negatively related to dropout (H2g; $b = -0.206$, $SE = 0.082$, $p = 0.012$), with a one standard deviation increase in school misbehavior accounting an approximate decrease in the odds of dropping out of 51%.¹²

Youth who were delinquent were more likely to be excluded from school (H2f; $b = 0.205$, $SE = 0.077$, $p = 0.008$) and drop out of school (H2h; $b = 0.421$, $SE = 0.092$, $p = 0.000$). Specifically, the effect of engaging in delinquency increased the odds of school exclusion by approximately 43% and the odds of dropout by approximately 111%.

¹¹ Probit coefficients were transformed to approximate odds ratios by multiplying the unstandardized probit coefficient by 1.7, then exponentiating (see Long, 1997; see also Amemiya, 1981). For example, the odds ratio for school bond's impact on delinquency was calculated as follows: $\text{Exp}(-0.170 \times 1.7) = 0.749$.

¹² Bivariate analyses indicated a negative, nonsignificant relationship between school misbehavior and dropout.

Figure 3. Significant Paths of the Hybrid SEM Model



$p < .05^*$, $p < .01^{**}$, $p < .001^{***}$

$\chi^2(838) = 2460.72$, $p = 0.000$; RMSEA = 0.04, CFI = 0.94, TLI = 0.93

Abbreviations: SE = School Exclusion, DO = Dropout

Table 7. Unstandardized and Standardized Direct Effects of Endogenous Variables

| | Unstd b | Std b | SE | p |
|--|----------------|--------------|-----------|----------|
| School Bond → School Misbehavior | -0.09 | -0.18 | 0.04 | 0.00*** |
| School Bond → Delinquency | -0.17 | -0.17 | 0.05 | 0.00*** |
| School Bond → School Exclusion | 0.02 | 0.02 | 0.05 | 0.72 |
| School Bond → Dropout | -0.07 | -0.06 | 0.06 | 0.29 |
| School Misbehavior → School Exclusion | 0.47 | 0.23 | 0.07 | 0.00*** |
| School Misbehavior → Dropout | -0.42 | -0.21 | 0.08 | 0.01* |
| Delinquency → School Exclusion | 0.44 | 0.21 | 0.08 | 0.01** |
| Delinquency → Dropout | 0.44 | 0.42 | 0.09 | 0.00*** |
| School Exclusion → Employment | -0.01 | -0.01 | 0.07 | 0.83 |
| School Exclusion → Postsecondary Education | -0.20 | -0.19 | 0.09 | 0.04* |
| School Exclusion → Romantic Relationship | 0.00 | 0.00 | 0.08 | 0.95 |
| School Exclusion → Offending | 0.51 | 0.48 | 0.09 | 0.00*** |
| School Exclusion → Incarceration | 0.07 | 0.07 | 0.10 | 0.47 |
| Drop Out → Employment | -0.03 | -0.03 | 0.08 | 0.65 |
| Drop Out → Postsecondary Education | -0.28 | -0.27 | 0.08 | 0.00*** |
| Drop Out → Romantic Relationship | 0.02 | 0.02 | 0.08 | 0.84 |
| Drop Out → Offending | 0.48 | 0.46 | 0.10 | 0.00*** |
| Drop Out → Incarceration | 0.29 | 0.30 | 0.12 | 0.01** |
| Employment → Offending | 0.03 | 0.03 | 0.07 | 0.64 |
| Employment → Incarceration | -0.24 | -0.23 | 0.07 | 0.00*** |
| Postsecondary Education → Offending | 0.02 | -0.02 | 0.10 | 0.88 |
| Postsecondary Education → Incarceration | 0.01 | 0.01 | 0.12 | 0.95 |
| Romantic Relationship → Offending | -0.03 | -0.02 | 0.06 | 0.70 |
| Romantic Relationship → Incarceration | -0.00 | -0.00 | 0.06 | 0.99 |

Note: STDY reported for binary variables, STDXY reported for continuous variables.

$p < .05^*$, $p < .01^{**}$, $p < .001^{***}$; $\chi^2(838) = 2460.72$, $p = 0.000$; RMSEA = 0.04, CFI = 0.94, TLI = 0.93

Turning to research question three, six relationships reached statistical significance. Experiencing school exclusion decreased the odds of enrolling in postsecondary education by approximately 29% (H3b; $b = -0.186$; $SE = 0.091$, $p = 0.041$) and increased the odds of offending in young adulthood by approximately 138% (H3e; $b = 0.481$, $SE = 0.091$, $p = 0.000$). School exclusion did not predict employment, romantic relationships, or incarceration.

Individuals who dropped out of school were less likely to be enrolled in postsecondary education (H3g; $b = -0.239$, $SE = 0.087$, $p = 0.006$), with the effect of dropping out decreasing the odds of postsecondary enrollment by approximately 38%. In addition, the effect of dropping out increased the odds of both offending (H3i; $b = 0.463$, $SE = 0.099$, $p = 0.00$) and incarceration (H3j; $b = 0.300$, $SE = 0.116$, $p = 0.010$) by approximately 127% and 63%, respectively.¹³ Dropout was not related to employment or romantic relationships.

Of the young adult bonds that were considered as factors that may protect against offending and incarceration, only employment significantly reduced the likelihood of incarceration (H3l; $b = -0.234$, $SE = 0.071$, $p = 0.001$). Specifically, the effect of being employed decreased the odds of incarceration by approximately 33%.

Decomposing Effects

Table 8 details the results of decomposing the effects of school bond on subsequent outcomes into total indirect (TIE) and specific indirect effects (SIE) to

¹³ The direct link between dropout and incarceration was investigated in additional analyses which regressed same-wave incarceration on offending. In this model, the effect of offending increased the odds of incarceration ($b = 0.302$, $SE = 0.097$, $p = 0.00$) and there was no longer a direct effect between dropout and incarceration ($b = 0.160$, $SE = 0.141$, $p = 0.257$). These findings indicate that the direct link between dropout and incarceration found in the main analyses likely operates through offending.

examine whether any indirect relationships exist. Total effects are omitted, as there were no direct pathways from school bond to any of the young adult constructs. Only significant specific indirect effects indicated by joint significance are detailed in Table 8. Joint significance is a simple way to infer mediation if two adjoining paths are statistically significant (Woody, 2011). All SIEs are included in Appendix B.

Table 8. Decomposing the Effects: Total Indirect and Specific Indirect Effects of School Bond on Postsecondary Education, Offending, and Incarceration

| | Std b | SE | <i>p</i> |
|-------------------------|--------------|-----------|-----------------|
| Postsecondary Education | | | |
| Total Indirect | 0.04 | 0.02 | 0.06 |
| Specific Indirect | | | |
| SB → D → DO → PE | 0.02 | 0.01 | 0.03* |
| Offending | | | |
| Total Indirect | -0.08 | 0.03 | 0.03* |
| Specific Indirect | | | |
| SB → D → SE → O | -0.02 | 0.01 | 0.04* |
| SB → SM → SE → O | -0.02 | 0.01 | 0.02* |
| SB → D → DO → O | -0.03 | 0.01 | 0.01* |
| SB → SM → DO → O | 0.02 | 0.01 | 0.05* |
| Incarceration | | | |
| Total Indirect | -0.04 | 0.02 | 0.12 |
| Specific Indirect | | | |
| SB → D → DO → I | -0.02 | 0.01 | 0.05* |

Note: Only significant effects are shown. All SIEs are presented in Appendix B.
 Abbreviations: SB = School Bond, SE = School Exclusion, PE = Postsecondary Education, DO = Dropout, D = Delinquency, SM = School Misconduct, O = Offending, I = Incarceration.
 $p < .05^*$, $p < .01^{**}$, $p < .001^{***}$

In relation to postsecondary education, there is a significant SIE in which youth with a stronger bond to school are more likely to enroll in postsecondary education via avoiding delinquency and remaining enrolled in school ($b = 0.019$, $SE = 0.009$, $p = 0.027$). The TIE of school bond on postsecondary education is marginally significant ($b =$

0.037, $SE = 0.020$, $p = 0.055$), and none of the other SIE relationships show significant links between school bond and postsecondary education.

There are several different pathways between school bond and offending in young adulthood. The TIE is significant ($b = -0.075$, $SE = 0.034$, $p = 0.026$). Youth with a higher bond to school are less likely to offend in young adulthood via avoiding delinquency and not experiencing school exclusion ($b = -0.017$, $SE = 0.008$, $p = 0.036$), via avoiding delinquency and remaining enrolled in school ($b = -0.034$, $SE = 0.013$, $p = 0.011$), and via good behavior in school and not experiencing school exclusion ($b = -0.020$, $SE = 0.009$, $p = 0.020$). School bond was positively indirectly related to offending via school misconduct and dropout ($b = 0.017$, $SE = 0.009$, $p = 0.051$).

Finally, of the 24 indirect pathways from school bond to incarceration, only one SIE demonstrated a significant link between these constructs. Specifically, a high school bond was indirectly associated with not being incarcerated via avoiding delinquency and remaining enrolled in school ($b = -0.022$, $SE = 0.011$, $p = 0.050$). The TIE was non-significant.

Multigroup Hybrid SEM

Multigroup modeling was used to establish whether the theoretical model operated equally across racial subgroups. There were four racial subgroups present in the Crossroads data, but only White, Black, and Hispanic groups were evaluated due to a very small sample of youth in the Other category ($n=30$). Single-indicator latent constructs, in which all loadings are fixed to one and adjusted for reliability, were used to simplify the model (Kenny, 2015). However, measurement differences in latent constructs across groups were examined and are discussed in Appendix D as

supplemental analyses. These analyses reveal that some of the items used to create each latent construct operate differently across race.

Structural equality across groups in the theoretical model was tested by running repeated multigroup SEM models and fixing each path to equality one at a time (Kenny, 2011). After attempting to apply a multigroup framework to the full theoretical model, several adjustments were made due to specification issues. White youth, who make up the smallest racial/ethnic subgroup at baseline ($n=183$, 15%), had very few youth who were suspended/expelled ($n=26$) or dropped out of school ($n=21$). Additionally, only 11 White youth were identified as being incarcerated across waves six and seven. Due to estimation difficulties related to low variation in the White subsample, school exclusion (suspension/expulsion) and dropout were collapsed into a single category in the multigroup analyses, and incarceration was removed as an outcome. While this limits the ability to examine the full theoretical model of the school-to-prison pipeline across race, it does offer an exploration of how school bond influences a disruption in education—whether this be through suspension, expulsion, or dropping out—via school misbehavior and delinquency, and how this disruption impacts young adult bonds and continued offending.

In the modified model, there are 12 directional paths between endogenous variables and an additional 64 paths between the eight exogenous covariates and eight endogenous variables. As such, the base model constrained all exogenous/endogenous relationships to equality in order to focus on differences in the endogenous paths. Additionally, there are six correlations estimated between exogenous variables and four correlations estimated between same-wave endogenous variables. These correlations

were evaluated for equality after examining the equality of all directional paths between endogenous variables. In total, 23 models were run, constraining one path at a time across groups. Models were estimated using WLSMV. Model fit was examined in each subsequent model using the “diffest” option in Mplus. If the fit of the constrained model was not significantly worse than the unrestricted model, the path was constrained to equality (Kline, 2016). Chi square difference tests for these models are detailed in Table 9.

Multigroup modeling compares unstandardized coefficients across groups, as the standardized coefficients may sometimes differ even when the paths are constrained across groups (Kline, 2016). Though measurement differences exist between the multigroup hybrid SEM and full hybrid SEM, it is worth noting that the structural relationships between both models are largely consistent (i.e. same significant/non-significant relationships in both models) for all paths except school misbehavior as a predictor for school exclusion, which is nonsignificant in the multigroup model. Table 10 details the unstandardized direct effects for multigroup model. After evaluating each structural relationship between endogenous variables, no paths were shown to vary across race. Therefore, all pathways were constrained to equality across groups. In other words, all structural relationships operate equally across race.

Table 9. Multigroup Hybrid SEM Path Constraints

| Pathway | χ^2 diff. test | <i>p</i> | Result |
|----------------|---------------------------------------|-----------------|----------------|
| B → SM | 1.00 | 0.61 | Constrain Path |
| B → D | 0.77 | 0.68 | Constrain Path |
| B → SE | 0.10 | 0.95 | Constrain Path |
| SM → SE | 3.92 | 0.14 | Constrain Path |
| D → SE | 0.03 | 0.99 | Constrain Path |
| SE → PE | 0.31 | 0.86 | Constrain Path |
| SE → E | 0.23 | 0.89 | Constrain Path |
| SE → R | 2.57 | 0.28 | Constrain Path |
| SE → O | 5.07 | 0.08 | Constrain Path |
| PE → O | 2.14 | 0.34 | Constrain Path |
| E → O | 3.74 | 0.15 | Constrain Path |
| R → O | 0.22 | 0.90 | Constrain Path |

Abbreviations: SB = School Bond, SE = School Exclusion, PE = Postsecondary Education, D = Delinquency, SM = School Misconduct, E = Employment, R = Romantic Relationship, O = Offending.

Table 10. Multigroup Model: Unstandardized Direct Effects on Endogenous Variables

| | Unstd b | SE | <i>p</i> |
|--|----------------|-----------|-----------------|
| Age → School Bond | 0.00 | 0.03 | 0.97 |
| SES → School Bond | -0.02 | 0.02 | 0.22 |
| IQ → School Bond | -0.00 | 0.00 | 0.03* |
| Grades → School Bond | 0.13 | 0.02 | 0.00*** |
| Impulsivity → School Bond | -0.07 | 0.04 | 0.11 |
| Delinquent Peers → School Bond | -0.16 | 0.05 | 0.00*** |
| Mother Attachment → School Bond | 0.27 | 0.03 | 0.00*** |
| Neighborhood Disorg. → School Bond | -0.07 | 0.04 | 0.10 |
| School Bond → School Misbehavior | -0.14 | 0.04 | 0.00*** |
| School Bond → Delinquency | -0.21 | 0.06 | 0.00*** |
| School Bond → School Exclusion | -0.06 | 0.05 | 0.23 |
| School Misbehavior → School Exclusion | 0.15 | 0.09 | 0.10 |
| Delinquency → School Exclusion | 0.31 | 0.08 | 0.00*** |
| School Exclusion → Employment | -0.03 | 0.05 | 0.61 |
| School Exclusion → Postsecondary Education | -0.30 | 0.07 | 0.00*** |
| School Exclusion → Romantic Relationship | -0.01 | 0.05 | 0.92 |
| School Exclusion → Offending | 0.33 | 0.07 | 0.00*** |
| Employment → Offending | 0.05 | 0.06 | 0.40 |
| Postsecondary Education → Offending | -0.04 | 0.08 | 0.62 |
| Romantic Relationship → Offending | -0.02 | 0.06 | 0.80 |

Note: In the multigroup model, school exclusion includes suspension, expulsion, and dropout.
 $p < .05^*$, $p < .01^{**}$, $p < .001^{***}$

Summary of Findings

To summarize, the hypotheses related to the first research question, which concerned factors that contributed to weak school bonds, had partial support. Grades, delinquent peers, maternal attachment, and neighborhood disorganization were each significantly related to school bond in the expected directions. Maternal attachment and grades had the strongest effects on school bond, indicating that maternal attachment may lay a foundation for youth to form a strong bond to school and that youth who are doing well in school are likely to demonstrate a strong school bond. Race, age, socioeconomic status, and impulsivity did not predict school bond. However, these factors predicted other endogenous constructs. As evidenced in Table 11 in Appendix A, a one standard deviation increase in impulsivity results in a one standard deviation increase in school misconduct. In addition, older youth were less likely to misbehave in school, engage in delinquency, experience school exclusion, drop out, or be incarcerated; and were more likely to be employed, in a romantic relationship, or enroll in postsecondary education.

Turning to the second research question, which considered the direct and indirect effects of school bond on school misbehavior, delinquency, school exclusion, and dropout, there was also partial support for hypotheses in the full model. While a stronger bond to school significantly reduced school misbehavior and delinquency, it did not directly influence school exclusion or dropout, but did indirectly affect these outcomes. Higher levels of school misbehavior increased the odds that youth experienced school exclusion; however, contrary to expectations, school misbehavior reduced the odds of dropout. Delinquent youth were more likely to experience both school exclusion and dropout. Exploring indirect effects revealed that youth with a strong school bond are

more likely to enroll in postsecondary education via avoiding delinquency and not dropping out of school. In addition, there were a number of indirect pathways between school bond and offending. A strong school bond was linked to decreased odds of offending via avoiding delinquency and not experiencing school exclusion, via behaving in school and not experiencing school exclusion, and via avoiding delinquency and not dropping out of school. School bond was related to increased odds of offending via misbehaving in school and dropping out. Finally, youth with a strong bond to school were less likely to be incarcerated via avoiding delinquency and remaining in school.

The third research question asked how school exclusion and dropout affect young adult roles (i.e. romantic relationships, postsecondary education, employment), offending, and incarceration in young adulthood. In the full theoretical model, support was found for six hypotheses. Youth who experienced school exclusion were less likely to enroll in postsecondary education and more likely to offend. Youth who dropped out of school were less likely to enroll in postsecondary education and more likely to offend or be incarcerated. Employment was the only young adult bond to directly impact incarceration—employed youth were less likely to be incarcerated.

The fourth research question asked how the theoretical model differed between White, Black, and Hispanic youth. After assessing equality between structural pathways, it was concluded that the relationships between constructs did not vary across race/ethnicity. Despite measurement differences in the latent constructs and school exclusion, the multigroup model largely resembled the full theoretical model.

CHAPTER 5 – DISCUSSION AND IMPLICATIONS

This study applies the age-graded theory of social control (Sampson & Laub, 1993, 2003; Laub & Sampson 2003) across adolescence and young adulthood to provide a theoretical foundation for the school-to-prison pipeline. While considerable research has focused on the causes and effects of school exclusion and dropout, much of these applications are conducted separately. The present study responds to recent calls to improve understanding of crime and deviance by integrating developmental and life-course frameworks with research on school-related delinquency risk (see Payne & Welch, 2016). By exploring both the causes and effects of school exclusion and dropout in a single model, there is an opportunity to consider several stages in which interventions may take place, which allows for a greater understanding of the school-to-prison pipeline. This study not only examines the causes of school exclusion and dropout (school misbehavior and delinquency), but also the possible factors that contribute to these more proximate causes (school bond, range of covariates). By exploring the sources of weak bonds to school and how weak bonds to school contribute to school misbehavior and delinquency, this study adds an additional layer to the existing literature.

Furthermore, the present study considers multiple longer-term effects of school exclusion and dropout on both non-criminal (employment, college enrollment, romantic relationships) and criminal (offending, incarceration) outcomes in a single model, whereas prior research has largely been limited to a single outcome. In addition to these important advancements, this study examines whether the causes and consequences of school exclusion and dropout vary across race/ethnicity.

Key findings include support that youth with a strong attachment to their mothers are more likely to form a strong bond to school, net of other factors, which is consistent with prior research. Also consistent with prior research, youth with a strong bond to school are less likely to misbehave in school and engage in delinquency. School misbehavior and delinquency, in turn, are associated with school exclusion. While engaging in delinquency increased the odds of dropping out of school, school misbehavior decreased these odds. Both school exclusion and dropout were negatively associated with enrolling in postsecondary education, and positively associated with offending. Youth who dropped out of school were also more likely to be incarcerated in young adulthood. Of the young adult bonds examined as possible mechanisms between school exclusion and dropout, and offending and incarceration, only employment reduced the odds of incarceration.

Examining the full model through indirect effects, there are several key pathways from school bond to both offending and incarceration. While only the pathway from school bond to incarceration via delinquency and dropout may reflect a true “school-to-prison pipeline” phenomenon, a number of pathways also exist between school bond and offending. Youth with a strong bond to school are less likely to offend in young adulthood via delinquency and school exclusion, via school misconduct and school exclusion, and via delinquency and dropout. The lack of indirect effects through any of the young adult bonds indicates that further exploration is needed in this area.

The multigroup model revealed that the relationships between school bond and subsequent outcomes are invariant across race/ethnicity. Though no variation was found, these analyses offer an exploration of race that is often lacking in studies of school

exclusion and dropout over the life course (see Pesta, 2018). It is also possible that disproportionality in school exclusion and dropout may be better observed in the context of perceived discrimination (see Unnever et al., 2016), or at the school level, as detailed below. Findings for both the theoretical and multigroup models have important implications for both theory and policy, which are discussed below.

Theoretical Implications

Social control theory was of primary interest to this study, particularly with respect to school bonds. The present study advances theory in several key areas. The primary goal was to contribute to the limited DLC literature that positioned schools as a principal source of socialization during adolescence in the context of the school-to-prison pipeline. The overall model accomplished this by integrating school-related risk factors that contribute to subsequent deviance and considering how social bonds may change across the lifecourse. While school bond was central to the model, additional sources of social bonds were considered as predecessors to (e.g., maternal attachment) and successors of (employment, postsecondary education, romantic relationships) school bonds. By including a myriad of outcomes in this framework, the theoretical model considered how a poor bond to school has consequences for deviance, removal from school, and bonds in young adulthood. In other words, this model examined whether a poor school bond set in motion developmental processes that contributed to continuity in offending as youth transitioned into young adulthood.

By positioning school bonds and other school experiences, such as school misbehavior, school exclusion, and dropout, as a focus in the theoretical model, school experiences were directly examined as a possible turning point in offending trajectories.

As argued by Payne and Welch (2016), though prominent DLC theories acknowledge schools as a source of socialization (e.g., Sampson & Laub, 1993; Thornberry, 1987), direct tests of how schools contribute to persistent deviance are limited, and the specific educational factors that influence deviance require greater attention. While all of the hypothesized relationships were not supported, the theoretical model proposed in the present study offers a framework from which future research can continue to assess how a critical social institution during adolescence impacts several domains during the transition to young adulthood.

In addition to applying a DLC framework to education, the present study contributes to the school bond literature. While the link between school bonds and both delinquency and school misbehavior is well-established in prior research, studies that include all four school-specific bonds are rare. The present study empirically tested a global school bond construct that consisted of all four bonding elements (attachment, commitment, involvement, belief). Furthermore, the longitudinal framework allowed for the examination of both short- and long-term effects of youths' bonds to school. For example, a strong school bond is directly associated with reduced school misbehavior and delinquency in adolescence, and indirectly associated with offending and incarceration in young adulthood. By considering a multitude of outcomes in relation to school bond, the present study expands on past research that was largely limited to a single outcome and demonstrates that youths' bonds to school have both short- and long-term consequences for deviance and school exclusion as youth transition to young adulthood.

The present study also advances the limited research that has explored racial differences in school bond and its impact on subsequent outcomes. While bivariate

analyses revealed that Black youth have a stronger bond to school relative to White youth, when accounting for other factors, race/ethnicity was not significantly associated with school bond in the full model. Though the theoretical model proposed in the present study offers an important contribution to DLC literature by emphasizing schools as a prominent contributor to subsequent outcomes, as discussed above, the multigroup modeling strategy employed in this study takes this model one step further by exploring whether these relationships vary across race. The findings of the multigroup model indicate that, in the school-to-prison pipeline framework utilized in the present study, these relationships do not vary across race.

Although prior research indicates that youth of color are disproportionately suspended and expelled, the present study indicates that the causes of school exclusion, namely school misbehavior and delinquency, do not vary in the effect that they have on school exclusion across race. In other words, for all youth, school misbehavior and delinquency result in increased odds of school exclusion. With respect to the long-term effects of school exclusion, the effect of school exclusion on offending and the effect of dropout on both offending and incarceration in young adulthood did not vary across race. All youth who experienced school exclusion were equally at risk of continued offending, and all youth who experienced dropout were likely to offend or be incarcerated in young adulthood, regardless of race. In sum, while this lack of variation was not necessarily expected in light of evidence demonstrating the disproportionate punishment of youth of color (Advancement Project, 2005; Chu & Ready, 2018; Costenbader & Markson, 1995; Eitle & Eitle, 2004; Fabelo et al., 2011; Hinojosa, 2008; Kupchik & Alleyne, 2017; Mittleman, 2018; Peguero, Bondy, & Shekarkhar, 2017b; Pesta, 2018; Skiba, 2008; Skiba

et al., 2002; Skiba et al., 2014b; U.S. Department of Education Office for Civil Rights, 2014), the findings indicate that as a process, the influence of school bond on outcomes explored in this model are consistent for all youth, regardless of race/ethnicity.

Recently, Rocque and colleagues (2019) examined whether the relationship between psychosocial maturation and distance varied across race. Psychosocial maturity refers to individual's temperance (self-control), perspective (long-term thinking), and responsibility, and proposes that increased maturity development as youth transition from adolescence to young adulthood leads to a decrease in risky behavior (Cauuffman & Steinberg, 2000). Across White, Black, and Hispanic groups, psychosocial maturation was negatively associated with delinquency and differences in the strength of this association across groups were small. These findings offer support for a general theoretical perspective of desistance across race/ethnicity (Rocque et al, 2019). The present study also found a lack in variation across race/ethnicity with regard to how school-to-prison pipeline processes unfold during adolescence and young adulthood. As such, there is support for the general application of this model, which applies a bonding perspective in a DLC framework, when considering how youths' bonds to school may impact deviance, school exclusion, and other experiences as youth transition to young adulthood.

Not to be overlooked, supplemental analyses also consider how variations across race influence the measurement of school bond (Appendix D), which contributes to the limited knowledge surrounding whether the items that contribute to bonding variables and other key constructs germane to the school-to-prison pipeline have equal measurement properties across race. As the results of these models revealed that item

loadings could be constrained to equality for commitment, belief, and school misconduct, but not for attachment, further research is needed to discern differences in item function across race/ethnicity. Greater attention to measurement in future research will enable more definitive conclusions regarding the racial/ethnic invariance of the structural process studied herein.

Finally, in line with the DLC/bonding framework, Thornberry's (1987) interactional theory argues that bonds have a reciprocal relationship with delinquency across the lifecourse. While the goal of the present study was to understand how key elements of the school-to-prison pipeline unfold as a process of social bonding across the life course, reciprocal effects between key constructs were explored in supplemental analyses (Appendix D). Support for the hypothesized directions was found in eight relationships, however four of these relationships were reciprocal and deserve further discussion. Of all of the interrelationships that were explored in this dissertation, only the relationships concerning delinquency or deviance-related outcomes were reciprocal—specifically, cross-lagged relationships were found between school bond and school misconduct, school bond and delinquency, school exclusion and delinquency, and employment and incarceration. The reciprocal relationships between school bond and school misconduct and school bond and delinquency supports key ideas in interactional theory (see Thornberry, 1987; see also Thornberry & Krohn, 2005) and prior research findings (Liljeberg et al., 2011; Lisa & Reed, 1985; Thornberry et al., 1991) that weak bonds may condition increased deviance, and that deviance may also weaken bonds. However, the only young adult bond that demonstrated a cross-lagged relationship with a deviance-related outcome was employment, which offers partial support for continued

interactions between bonds and deviance in young adulthood. While the findings did not indicate an association between romantic relationships and deviance-related outcomes, there is evidence that marriage is strongly related to a reduction of crime in adulthood (Sampson et al., 2006). It is plausible that romantic relationships during late adolescence and young adulthood may not have the same protective factors as marriage during adulthood. These findings warrant further exploration in future research.

Policy Implications

While the findings at each stage of the present study's model are largely consistent with prior research, this study's in-depth, holistic examination of the school-to-prison pipeline through a developmental and life-course lens offers insight on multiple points of intervention during development—from childhood through the transition to young adulthood. Each stage of the model proposed in this study offers several policy implications and areas for prevention. As discussed by Tonry and Farrington (1995), prevention strategies can be situated within developmental, community, and situational frameworks. Developmental prevention focuses on interventions aimed at preventing the development of deviant tendencies. Community prevention targets the social conditions that influence delinquency. Finally, situational prevention is designed to reduce opportunities to engage in crime. The theoretical model presented in this study can be divided among similar lines. The first stage of the model considers how the formation of a strong bond to school may prevent subsequent deviance (developmental prevention). The next stage examines how negative school experiences, namely school exclusion and dropout, may propel youth into continued negative trajectories—harming prosocial bonds and increasing the risk of continued deviance and incarceration (community prevention).

The last stage of the model assesses whether prosocial bonds mediate the negative effects between school exclusion/dropout and incarceration/crime in young adulthood (situational prevention). Prevention strategies and policy implications at each stage of the model are discussed below.

At the first stage of the model, there is support for the interconnections of different forms of social bonds in early adolescence. As strong maternal attachment is associated with a stronger school bond, programs that seek to increase parents' involvement in education may be beneficial investments to increase youths' bonds to school and decrease risk of school exclusion and dropout. In addition, youth with better grades in school were more likely to establish a stronger school bond, which indicates that increasing school achievement may help form attachments to school. Prior research has established that schools that create partnerships with parents and increase the capacity for parents to engage with their child's education are able to increase the academic achievement of students (Henderson & Mapp, 2002), which may in turn increase youths' bond to school. Similarly, providing parents with parenting training, coupled with self-control and social skills training for youth has positive effects on grade retention (Tremblay et al., 1992), which may point to a deeper commitment to school.

As maternal attachment and grades had the largest effects on school bond, this suggests that pursuing interventions in these areas is important to establish a strong foundation for youth to form positive bonds to school. One such program that directly incorporates parents as sources for reducing problem behaviors and engaging their children in schools is Family and Schools Together (FAST). This intervention uses a peer-to-peer model in which families attend group sessions with other families and work

to build positive communication between parents and their children, and between families and schools. Youth who have participated in FAST with their families are more likely to perform well academically (Kratchowill et al., 2004; McDonald et al., 2006).

In the first stage of the model, there was also support that weak school bonds predict school misbehavior and delinquency. There are several policies and programs that focus on increasing student-teacher relationships and involvement in school activities. In the classroom, addressing teachers' role in the school-to-prison pipeline includes broadening their knowledge of adolescent development and how this relates to student motivation, managing behaviors, and implementing effective classroom management (Osher et al., 2012). By improving students' relationships with teachers, students are less likely to exhibit behavior problems in school (Crosnoe et al., 2004). One evidence-based program that focuses on improving student-teacher relationships in order to improve youths' positive views of school and reduce misbehavior both in and out of school is the Positive Action program (Blueprints for Healthy Youth Development, 2020). This program uses a school-wide climate change approach to reinforce positive behaviors. Students are taught skills such as healthy habits, problem solving, managing personal resources, cooperation, respect, taking responsibility, and setting goals. Randomized studies have revealed that this program improves students' feelings of school support and reduces substance use and violent behavior (Beets et al., 2009; Li et al., 2011). Additionally, specific to the involvement element of the school bond, encouraging involvement in diverse, nonathletic activities, such as student government, school clubs, and honor societies, is associated with decreased alcohol use (Hoffman, 2006) and school discipline (Latimore et al., 2017).

The next stage of the model considers whether school misbehavior and delinquency affects school exclusion and dropout. School misbehavior and delinquency both predict school exclusion, and delinquent youth are more likely to drop out of school. Therefore, there are further implications for prevention strategies in schools. For example, in an extensive review of school-based interventions, Valdebenito and colleagues (2018) found that programs that incorporate youth mentoring, enhancing academic skills, providing skills training to teachers, and improving counseling and mental health services were effective in reducing school exclusion. Restorative justice practices that incorporate students who misbehave into decision-making and promote engaging students in resources may reduce suspensions (Klein, 2016; Payne & Welch, 2018). Diversion programs for nonviolent offenses that implement diverse services for students may reduce schools' reliance on arrests (Fader et al., 2015), which may lower the use of exclusionary school sanctions. For example, the Philadelphia Police School Diversion Program specifically targets reducing arrests in response to school-based offenses. This program connects youth and their families to prevention services in lieu of an arrest. While the focus of this program is decreasing the use of arrests, after one year of implementation, expulsions and school disciplinary transfers were reduced by 75%, and behavioral incidents in schools were reduced by 17% (OJJDP, 2015).

The final stage of the model considers whether disruption in schooling via school exclusion and/or dropout has negative effects on conventional bonds in young adulthood and, ultimately, continued offending and incarceration. In the theoretical model, both school exclusion and dropout were indicative of subsequent offending, and youth who dropped out of school were more likely to experience incarceration in young adulthood.

One wide-reaching policy that demonstrates reductions in criminal activity is compulsory school laws. Increasing the minimum dropout age reduces the likelihood of adult arrests, incarceration, and offending (Bell et al., 2016; Lochner & Moretti, 2004). While these laws may not directly affect suspension or expulsion policies, they establish the age at which youth must continue to receive education. This means that youth who are expelled may be more likely to enroll in non-traditional forms of education.

Turning to the effects of school exclusion and dropout on young adult bonds, school exclusion and dropout significantly reduced the odds that youth would enroll in postsecondary education. This is consistent with prior research that has demonstrated that school exclusion and dropout have negative implications for postsecondary education (Rosenbaum, 2018; Rumberger & Lamb, 2003). Increasing participation in non-traditional education as a way to obtain a high school diploma or GED may increase individuals' ability to engage in conventional sources of social control during the transition to adulthood. The Early College High School Model is an evidence-based program that seeks to increase underrepresented (minority, low-income, first-generation college) students' enrollment in postsecondary education (Blueprints for Healthy Youth Development, 2020). This program allows students to complete college courses while still enrolled in high school, which allows students access to support from high school staff. Support includes advising, tutoring, and college "life skills" preparation. Additionally, this model is designed to target students at-risk of dropping out of school. Students who complete this program are more likely to earn a postsecondary degree (Edmunds et al., 2017; Song & Zeiser, 2019).

As discussed by Laub and Sampson (2003), prosocial bonds can act as a turning point to deter offending, even for individual with prior delinquent histories. While postsecondary education did not significantly reduce offending or incarceration, employment did significantly reduce the odds of incarceration in young adulthood, indicating that employment may offer an additional intervention point in young adulthood. When considering employment's relationship with offending, however, it is important to consider how this relationship may change across the lifecourse. For example, during adolescence, jobs that support youths' education and academic roles are most effective in reducing arrest, school misbehavior, and alcohol use (Staff & Uggen, 2003). Working more than 20 hours per week during adolescence may actually have negative consequences for youth, such as insufficient sleep (Bachman & Schulenberg, 1993), and increased alcohol use and school misbehavior (Staff & Uggen, 2003). In general, the link between employment and crime reduction may be most important during early adulthood, after age 25 (Sampson & Laub, 1993; Uggen, 2000, Wright et al, 2002).

Limitations and Directions for Future Research

As with all research, there are several limitations. First, though Crossroads is a rich longitudinal dataset with a large sample size, all participants are system-involved males. This may limit the generalizability to non-system-involved youth and females. However, as the focus of this dissertation is to assess the causes and effects of the school-to-prison pipeline, employing a sample of first-time juvenile offenders increases the likelihood that key study variables (school misbehavior, delinquency, school exclusion, dropout) are observed.

Second, the age of the sample may have influenced whether each stage of the model is observed. For example, youth who were 13 years old at baseline were 17 years old at the final wave, and may not represent the transition into young adulthood or have established the key social bonds observed at wave five, when these participants were around 15 to 16 years old. As demonstrated in Table 11 in Appendix A, older youth are more likely to be employed, enrolled in postsecondary education, or be in a romantic relationship. As data collection is ongoing, this model can be applied in future research with older youth.

Third, not all causes of weak bonds to school were considered—the covariates included in the model explained 20.8% of the variation of school bond. For example, developmental deficits in language and reasoning may contribute to difficulties in school by delaying development and limiting academic achievement, which may influence bonds to school and subsequent delinquency (Moffitt, 1993). Furthermore, adolescents' self-control may mediate effects of attachment to school on delinquency (Alvarez-Rivera et al., 2017) and adverse childhood experiences may increase the likelihood of arrest, regardless of the strength of prosocial attachments (Craig et al., 2017). In addition, the contextual effects that different neighborhoods may impose on bonds to school, which may operate differently than perceptions of neighborhood disorganization, were not thoroughly considered (Chung et al., 2010). Future research may also benefit from a consideration of additional parenting constructs in reference to maternal/paternal attachments. Related, only baseline-level covariates were used in the model. Several of the covariates are time varying (i.e. grades, impulsivity, delinquent peers, maternal attachment, neighborhood disorganization), and the model employed in the present study

does not account for current levels of these measures in relation to endogenous variables. Future research should consider whether more proximate levels of these covariates impacts the relationships between key study variables.

Fourth, the present study focused on one theoretical framework and its applicability across different racial groups, which does not allow for direct comparisons of competing theories. While comparing and contrasting theories is an important area of research, especially considering how theories may differentially explain delinquency for different youth (Ward et al., 2018), the goals of this dissertation and model complexity were best suited for a single framework. While the theoretical basis for this dissertation was DLC/bonding, several other theories may explain the relationship between negative school experiences and success in young adulthood. For example, consistent with labeling theory, Jacobsen (2019) argued that school suspension stigmatizes youth and found that suspended students have fewer friends and are more likely to discontinue existing friendships. In addition, their relationships with friends are more likely to be perceived as poor and they are more likely to associate with deviant peers. A strain framework may also shed light on the relationship between one element of school bond, belief in school rules, and school misbehavior. James and colleagues (2019) examined the relationship between perceived school fairness and fighting in school. They found that for both White and nonwhite youth, perceiving that rules are fair resulted in less fighting. In addition, for nonwhite youth, strong support from adults acted as a protective factor, reducing the likelihood of fighting even when perceiving high levels of unfair school rules. Future research should consider how alternative theories may contribute to the school-to-prison pipeline.

Fifth, data limitations did not allow for the assessment of all factors that may contribute to the school-to-prison pipeline, such as: reasons for dropout (Jarjoura, 1993; Sweeten et al., 2009); the effect of parental incarceration on school bond (Cochran et al., 2018); other correlates of school exclusion and dropout, such as concentrated disadvantage, involvement with Child Protective Services, and victimization (Mittleman, 2018); intergenerational consequences of having parents who were disinvested in education (Hagan & Parker, 1999); the effects of other institutional controls (such as church; Alvarez-Rivera et al., 2017); and the effects of school security on school bonds (Fisher et al., 2018). In addition, the present study did not consider the quality of bonds in young adulthood. For example, job stability and romantic relationships that exhibit strong attachment and commitment may be more important than simply being employed or in a relationship (see Sampson & Laub, 1990). The data also rely on self-report measures of suspension, expulsion, and dropout without the corroboration of official school records. Each of these elements has important policy implications and should be considered in future research.

Finally, this dissertation only examined between-person differences in the school-to-prison pipeline process. As argued by Mowen and colleagues (2019), focusing on between-person differences may limit the ability to pinpoint experiences that act as turning points and trigger within-person changes over time. Multilevel analyses would also allow research to distinguish between time-stable and time-varying characteristics that would account for differences in population heterogeneity as it relates to individuals' ability to form strong bonds across the life course. Future research should consider alternative modeling strategies that incorporate both between- and within-person effects

in the school-to-prison pipeline context. In addition, school-level effects were not examined. While examining how the proposed theoretical model operates at the school level was beyond the scope of this dissertation, students' bond to school and experiences in school are, in part, a product of between-school differences. For example, schools with higher levels of exclusionary discipline produce adverse consequences, even for youth who are *not* suspended. For these youth, academic achievement is negatively affected, which points to collateral consequences of schools with a punitive context (Perry & Morris, 2014). As experiencing school exclusion was associated with increased offending in young adulthood in the present study, future research should consider how, at the school-level, high rates of suspension and expulsion influence outcomes for youth.

In addition, elements of the school bond, such as belief in the fairness of school rules, has been demonstrated to reduce student misconduct (Welsh et al., 1999; Welsh, 2001) and delinquency (Gottfredson, Gottfredson, Payne, & Gottfredson, 2005; Welsh, 2001) at the school level. A second element, attachment to school, has also exhibited school-level effects. For instance, youth who are enrolled in schools where students have high overall levels of attachment to school are less likely to use alcohol (Henry & Slater, 2007), and students in schools with high levels of commitment are less likely to be suspended (Hemphill et al., 2014). As the present study demonstrates that a strong bond to school is associated with lower school misconduct and delinquency, future research should consider how these effects may operate at the school level. Indeed, there is a general need for more multilevel investigations of school effects and delinquency (see Welsh & Harding, 2015) and evidence that school-level policies may contribute to the disproportionate sanctioning of minority youth (Hirschfield, 2018b). In applying this

model across levels of analysis, a multilevel SEM could determine whether school-to-prison pipeline processes operate similarly or differently at the within- and between-school levels.

Conclusion

The present study offered a cohesive examination of the school-to-prison pipeline by employing a model of social control across adolescence to evaluate the factors that contribute to school exclusion and dropout, as well as the consequences of school exclusion and dropout on young adult bonds, offending, and incarceration. Through utilizing a single model, multiple intervention points were considered to halt the school-to-prison pipeline process, which have important implications for policies related to positive relationships with school. Though the exploration of young adult bonds as mediators in the relationship between school exclusion/dropout and offending/incarceration in young adulthood was not supported, this study expands on prior literature by offering a unified examination of a multitude of outcomes related to school bond—school misbehavior, delinquency, school exclusion, and dropout—in a single model. Indirect links between school bond and offending and incarceration demonstrate that the school-to-prison pipeline process may be halted by fostering strong bonds to school during early adolescence to reduce deviant behaviors early in the life course. Future research directions include a continued examination of these processes as youth age and considering how these processes may operate differently at the within-person and between-school levels of analyses.

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APPENDIX A. STANDARDIZED DIRECT EFFECTS OF EXOGENOUS VARIABLES ON ENDOGENOUS VARIABLES

Table 11. Standardized Direct Effects of Exogenous Variables on Endogenous Variables

| | School Misconduct | | | Delinquency | | | School Exclusion | | |
|----------------------|-------------------|------|----------|-------------|------|----------|------------------|------|----------|
| | Std b | SE | <i>p</i> | Std b | SE | <i>p</i> | Std b | SE | <i>p</i> |
| Black | 0.14 | 0.12 | 0.25 | -0.17 | 0.12 | 0.17 | 0.13 | 0.15 | 0.38 |
| Hispanic | 0.15 | 0.12 | 0.19 | -0.10 | 0.12 | 0.39 | 0.04 | 0.15 | 0.79 |
| Other | 0.24 | 0.26 | 0.35 | -0.02 | 0.25 | 0.94 | 0.41 | 0.26 | 0.12 |
| Age | -0.22 | 0.04 | 0.00*** | -0.09 | 0.04 | 0.02* | -0.30 | 0.05 | 0.00*** |
| SES | 0.01 | 0.04 | 0.89 | 0.06 | 0.04 | 0.13 | -0.09 | 0.05 | 0.05 |
| IQ | -0.02 | 0.04 | 0.61 | 0.00 | 0.04 | 0.95 | 0.00 | 0.05 | 0.97 |
| Grades | -0.09 | 0.04 | 0.01* | -0.10 | 0.04 | 0.02* | -0.06 | 0.05 | 0.20 |
| Impulsivity | 0.15 | 0.05 | 0.00*** | 0.06 | 0.05 | 0.21 | 0.08 | 0.06 | 0.17 |
| Delinquent Peers | 0.16 | 0.05 | 0.00*** | 0.41 | 0.04 | 0.00*** | -0.18 | 0.07 | 0.01** |
| Mother Attachment | -0.01 | 0.04 | 0.75 | -0.04 | 0.04 | 0.36 | 0.03 | 0.05 | 0.65 |
| Neighborhood Disorg. | 0.02 | 0.04 | 0.64 | -0.07 | 0.04 | 0.10 | 0.09 | 0.05 | 0.08 |

Note: STDY reported for binary variables, STDXY reported for continuous variables.

p < .05*, *p* < .01**, *p* < .001***

Table 11. Standardized Direct Effects of Exogenous Variables on Endogenous Variables, cont'd.

| | Dropout | | | Employment | | | Romantic Relationship | | |
|----------------------|---------|------|----------|------------|------|----------|-----------------------|------|----------|
| | Std b | SE | <i>p</i> | Std b | SE | <i>p</i> | Std b | SE | <i>p</i> |
| Black | -0.15 | 0.16 | 0.34 | -0.39 | 0.12 | 0.00*** | -0.14 | 0.11 | 0.31 |
| Hispanic | -0.06 | 0.16 | 0.70 | -0.03 | 0.12 | 0.82 | 0.09 | 0.13 | 0.50 |
| Other | -0.30 | 0.37 | 0.42 | 0.10 | 0.25 | 0.68 | -0.08 | 0.26 | 0.77 |
| Age | 0.42 | 0.06 | 0.00*** | 0.43 | 0.04 | 0.00*** | 0.15 | 0.05 | 0.01** |
| SES | -0.02 | 0.06 | 0.66 | -0.00 | 0.04 | 0.94 | 0.03 | 0.04 | 0.53 |
| IQ | -0.09 | 0.06 | 0.11 | 0.13 | 0.04 | 0.00*** | -0.02 | 0.04 | 0.72 |
| Grades | -0.02 | 0.06 | 0.77 | 0.08 | 0.04 | 0.04* | -0.02 | 0.04 | 0.71 |
| Impulsivity | 0.00 | 0.06 | 1.00 | 0.03 | 0.05 | 0.60 | -0.02 | 0.06 | 0.78 |
| Delinquent Peers | -0.00 | 0.07 | 0.98 | 0.01 | 0.05 | 0.84 | 0.04 | 0.05 | 0.45 |
| Mother Attachment | 0.03 | 0.06 | 0.57 | -0.05 | 0.05 | 0.35 | 0.09 | 0.06 | 0.14 |
| Neighborhood Disorg. | -0.02 | 0.06 | 0.74 | -0.03 | 0.04 | 0.54 | -0.01 | 0.05 | 0.85 |

Note: STDY reported for binary variables, STDXY reported for continuous variables.

$p < .05^*$, $p < .01^{**}$, $p < .001^{***}$

Table 11. Standardized Direct Effects of Exogenous Variables on Endogenous Variables, cont'd.

| | Postsecondary Education | | | Incarceration | | | Offending | | |
|----------------------|-------------------------|------|----------|---------------|------|----------|-----------|------|----------|
| | Std b | SE | <i>p</i> | Std b | SE | <i>p</i> | Std b | SE | <i>p</i> |
| Black | -0.02 | 0.15 | 0.89 | 0.46 | 0.17 | 0.01** | -0.12 | 0.15 | 0.41 |
| Hispanic | 0.03 | 0.15 | 0.85 | 0.18 | 0.18 | 0.31 | -0.01 | 0.15 | 0.95 |
| Other | 0.09 | 0.28 | 0.76 | 0.86 | 0.35 | 0.01* | -0.15 | 0.33 | 0.64 |
| Age | 0.53 | 0.06 | 0.00*** | -0.19 | 0.09 | 0.04* | -0.15 | 0.09 | 0.07 |
| SES | 0.07 | 0.05 | 0.16 | -0.08 | 0.05 | 0.14 | 0.10 | 0.05 | 0.05* |
| IQ | 0.12 | 0.05 | 0.02* | -0.06 | 0.06 | 0.25 | 0.12 | 0.05 | 0.04 |
| Grades | 0.15 | 0.05 | 0.01** | -0.06 | 0.05 | 0.25 | 0.06 | 0.05 | 0.25 |
| Impulsivity | 0.05 | 0.06 | 0.41 | -0.04 | 0.06 | 0.54 | -0.01 | 0.06 | 0.86 |
| Delinquent Peers | 0.07 | 0.07 | 0.31 | 0.15 | 0.06 | 0.01** | 0.28 | 0.06 | 0.00*** |
| Mother Attachment | 0.06 | 0.07 | 0.45 | -0.04 | 0.06 | 0.53 | -0.04 | 0.07 | 0.57 |
| Neighborhood Disorg. | -0.13 | 0.07 | 0.06 | 0.03 | 0.06 | 0.68 | -0.13 | 0.06 | 0.04 |

Note: STDY reported for binary variables, STDXY reported for continuous variables.

$p < .05^*$, $p < .01^{**}$, $p < .001^{***}$

APPENDIX B. DECOMPOSITION OF EFFECTS

Table 12. Decomposing the Effects: Total Indirect and Specific Indirect Effects of School Bond on Postsecondary Education

| | Std b | SE | <i>p</i> |
|--|--------------|-----------|-----------------|
| Total Indirect | 0.04 | 0.02 | 0.06 |
| Specific Indirect | | | |
| SB → SE → PE | -0.00 | 0.01 | 0.72 |
| SB → DO → PE | 0.02 | 0.02 | 0.31 |
| SB → D → SE → PE | 0.01 | 0.00 | 0.13 |
| SB → SM → SE → PE | 0.01 | 0.01 | 0.12 |
| SB → D → DO → PE | 0.02 | 0.01 | 0.03* |
| SB → SM → DO → PE | -0.01 | 0.01 | 0.08 |
| Abbreviations: SB = School Bond, SE = School Exclusion, PE = Postsecondary Education, DO = Dropout, D = Delinquency, SM = School Misconduct. | | | |
| <i>p</i> < .05*, <i>p</i> < .01**, <i>p</i> < .001*** | | | |

Table 13. Decomposing the Effects: Total Indirect and Specific Indirect Effects of School Bond on Offending

| | Std b | SE | <i>p</i> |
|-----------------------|--------------|-----------|-----------------|
| Total Indirect | -0.08 | 0.03 | 0.03* |
| Specific Indirect | | | |
| SB → SE → O | 0.01 | 0.02 | 0.72 |
| SB → DO → O | -0.03 | 0.03 | 0.31 |
| SB → D → SE → O | -0.01 | 0.01 | 0.04* |
| SB → SM → SE → O | -0.02 | 0.01 | 0.02* |
| SB → D → DO → O | -0.03 | 0.01 | 0.01* |
| SB → SM → DO → O | 0.01 | 0.01 | 0.05* |
| SB → SE → E → O | 0.00 | 0.00 | 0.88 |
| SB → DO → E → O | 0.00 | 0.00 | 0.79 |
| SB → SE → PE → O | 0.00 | 0.00 | 0.89 |
| SB → DO → PE → O | 0.00 | 0.00 | 0.88 |
| SB → SE → R → O | 0.00 | 0.00 | 0.96 |
| SB → DO → R → O | 0.00 | 0.00 | 0.86 |
| SB → D → SE → E → O | 0.00 | 0.00 | 0.86 |
| SB → SM → SE → E → O | 0.00 | 0.00 | 0.86 |
| SB → D → DO → E → O | 0.00 | 0.00 | 0.78 |
| SB → SM → DO → E → O | 0.00 | 0.00 | 0.78 |
| SB → D → SE → PE → O | 0.00 | 0.00 | 0.88 |
| SB → SM → SE → PE → O | 0.00 | 0.00 | 0.88 |
| SB → D → DO → PE → O | 0.00 | 0.00 | 0.88 |
| SB → SM → DO → PE → O | 0.00 | 0.00 | 0.88 |
| SB → D → SE → R → O | 0.00 | 0.00 | 0.96 |
| SB → SM → SE → R → O | 0.00 | 0.00 | 0.96 |
| SB → D → DO → R → O | 0.00 | 0.00 | 0.88 |
| SB → SM → DO → R → O | 0.00 | 0.00 | 0.87 |

Abbreviations: SB = School Bond, SE = School Exclusion, PE = Postsecondary Education, DO = Dropout, D = Delinquency, SM = School Misconduct, E = Employment, R = Romantic Relationship, O = Offending.
p < .05*, *p* < .01**, *p* < .001***

Table 14. Decomposing the Effects: Total Indirect and Specific Indirect Effects of School Bond on Incarceration

| | Std b | SE | p |
|-----------------------|--------------|-----------|----------|
| Total Indirect | -0.04 | 0.02 | 0.12 |
| Specific Indirect | | | |
| SB → SE → I | 0.00 | 0.00 | 0.75 |
| SB → DO → I | -0.02 | 0.02 | 0.34 |
| SB → D → SE → I | -0.00 | 0.00 | 0.49 |
| SB → SM → SE → I | -0.00 | 0.00 | 0.48 |
| SB → D → DO → I | -0.02 | 0.01 | 0.05* |
| SB → SM → DO → I | 0.01 | 0.01 | 0.09 |
| SB → SE → E → I | 0.00 | 0.00 | 0.85 |
| SB → DO → E → I | -0.00 | 0.00 | 0.67 |
| SB → SE → PE → I | 0.00 | 0.00 | 0.95 |
| SB → DO → PE → I | 0.00 | 0.00 | 0.95 |
| SB → SE → R → I | 0.00 | 0.00 | 0.99 |
| SB → DO → R → I | 0.00 | 0.00 | 0.99 |
| SB → D → SE → E → I | 0.00 | 0.00 | 0.83 |
| SB → SM → SE → E → I | 0.00 | 0.00 | 0.83 |
| SB → D → DO → E → I | -0.00 | 0.00 | 0.64 |
| SB → SM → DO → E → I | 0.00 | 0.00 | 0.64 |
| SB → D → SE → PE → I | 0.00 | 0.00 | 0.95 |
| SB → SM → SE → PE → I | 0.00 | 0.00 | 0.95 |
| SB → D → DO → PE → I | 0.00 | 0.00 | 0.95 |
| SB → SM → DO → PE → I | 0.00 | 0.00 | 0.95 |
| SB → D → SE → R → I | 0.00 | 0.00 | 0.99 |
| SB → SM → SE → R → I | 0.00 | 0.00 | 0.99 |
| SB → D → DO → R → I | 0.00 | 0.00 | 0.99 |
| SB → SM → DO → R → I | 0.00 | 0.00 | 0.99 |

Abbreviations: SB = School Bond, SE = School Exclusion, PE = Postsecondary Education, DO = Dropout, D = Delinquency, SM = School Misconduct, E = Employment, R = Romantic Relationship, I = Incarceration.

$p < .05^*$, $p < .01^{**}$, $p < .001^{***}$

APPENDIX C. MULTIGROUP MODEL CORRELATED PATH CONSTRAINTS

Table 15. Multigroup Hybrid SEM Correlated Path Constraints

| Correlated Pathway | χ^2 diff. test | <i>p</i> | Result |
|---|---------------------------------------|-----------------|----------------|
| Impulse/Peer Delinquency | 3.88 | 0.11 | Constrain Path |
| Impulse/Mother Attachment | 1.41 | 0.50 | Constrain Path |
| Impulse/Neighborhood Disorder | 12.05 | 0.00** | Free Path |
| Peer Delinquency/Mother Attachment | 6.39 | 0.04* | Free Path |
| Peer Delinquency/Neighborhood Disorder | 7.96 | 0.02* | Free Path |
| Mother Attachment/Neighborhood Disorder | 1.78 | 0.41 | Constrain Path |
| School Misconduct/Delinquency | 0.20 | 0.90 | Constrain Path |
| Romantic Relationship/Postsecondary Education | 7.31 | 0.03* | Free Path |
| Romantic Relationship/Employment | 1.11 | 0.57 | Constrain Path |
| Postsecondary Education/Employment | 0.25 | 0.88 | Constrain Path |

p < .05*, *p* < .01**, *p* < .001***

APPENDIX D. SUPPLEMENTAL ANALYSES

Multigroup CFA

CFA with multiple groups was completed for attachment, commitment, belief, and school misconduct and is detailed in Table 16.¹⁴ WLSMV estimation was used for all analyses, and nested model comparisons were conducted using the “difftest” option in Mplus. Whites served as the reference group in all invariance models. Measurement invariance was tested by estimating configural invariance, metric invariance, and scalar invariance models (see Brown, 2015).

A configural invariance model for attachment was specified to test whether the indicators selected for this latent variable were equal across groups (Vandenberg & Lance, 2000) by fixing the factor mean to zero and the factor variance to one for identification within each group. Two of the three fit indices demonstrated adequate fit: $\chi^2(163) = 1206.63, p = .000, RMSEA = .13, CFI = 0.93, TLI = 0.91$. As such, metric invariance was tested to examine whether indicators were related to the factor in the same manner across groups (Vandenberg & Lance, 2000). In the metric invariance model, the factor variance was fixed to one for Whites, but freely estimated for Blacks and Hispanics, and factor means were fixed to zero in all groups. Factor loadings were constrained to be equal across all groups. The metric invariance model resulted in a significant decrease in fit relative to the configural model: $\chi^2(22) = 75.15, p = 0.000$. This indicates that while the same observed items can be used to form the attachment factor, the relationship between indicators and the factor varies across groups.

¹⁴ For commitment and school misconduct, item response categories were collapsed from five to three, due to missing response values across groups. Commitment items were recoded to “strongly disagree/disagree” (1), “neither” (2), and “agree/strongly agree” (3). School misconduct items were recoded to “not at all” (1) “once or twice” (2) “several/many times” (3).

Comparisons between configural invariance and metric invariance models were completed for commitment, belief, and school misconduct, and are detailed in Table 16. For each of these constructs, the metric invariance models did not result in a significant decrease in fit relative to the configural models. Therefore, scalar invariance was tested to determine whether mean levels of these latent constructs varied across race (Vandenberg & Lance, 2000). In these models, the factor mean was fixed to zero and the variance was fixed to one for Whites, and the factor means and variances were free to vary in the comparison groups. All factor loadings and item intercepts were constrained to be equal across groups. For each construct, the scalar invariance model resulted in a significant decrease in relative fit to the metric model. This indicates that the factor loadings of the indicators for commitment, belief, and school misconduct are invariant across groups, but the remaining measurement properties (i.e. factor means and variances) are not.

Table 16. Test of Measurement Invariance in Latent Constructs across Race/Ethnicity

| Model | χ^2 | χ^2 diff. test | <i>p</i> | Result |
|------------------------------|----------------------------|---------------------------------------|-----------------|----------------------|
| Configural Invariance | | | | |
| Attachment | 1206.63 | | | |
| Commitment | 28.67 | | | |
| Belief ^a | -- | | | |
| School Misconduct | 51.04 | | | |
| Metric Invariance | | | | |
| Attachment | 876.06 | 75.15 | 0.00*** | Configural Preferred |
| Commitment | 32.16 | 7.54 | 0.48 | Metric Preferred |
| Belief | 7.95 | 7.95 | 0.09 | Metric Preferred |
| School Misconduct | 49.85 | 6.41 | 0.78 | Metric Preferred |
| Scalar Invariance | | | | |
| Attachment | -- | -- | -- | -- |
| Commitment | 70.57 | 40.07 | 0.00** | Metric Preferred |
| Belief | 52.21 | 45.08 | 0.00** | Metric Preferred |
| School Misconduct | 86.94 | 38.50 | 0.02* | Metric Preferred |

^aConfigural model fits perfectly because the model is freely estimated across groups with three loadings (0df).

Notes: Configural invariance = Same factor structure, loadings and intercepts free to vary across groups; Metric invariance = Loadings held equal across groups; Scalar invariance = Loadings and intercepts held equal across groups.

p < .05*, *p* < .01**, *p* < .001***

Cross-lagged Panel Models

Multiple two-wave cross-lagged panel models were completed between key constructs to explore directionality in relationships. Model results for each of the 24 cross-lagged relationships are presented in Table 17. To simplify these exploratory models, all variables were treated as observed. As there are many relationships to consider, results are presented in the following manner: First, I discuss relationships in which support was found for only the proposed direction. Second, I discuss relationships in which reciprocal relationships were found. Third, I discuss relationships in which support was found for the non-proposed direction.

Support for the relationships proposed in the theoretical model was found in four models. Youth with stronger bonds to school at wave one were less likely to drop out at waves three/four ($b = -0.17$, $SE = 0.05$, $p = 0.001$). Youth who engaged in more school misconduct at wave two were more likely to experience school exclusion at waves three/four ($b = 0.19$, $SE = 0.04$, $p = 0.000$). Youth who experienced school exclusion at waves three/four were less likely to be enrolled in postsecondary education at wave five ($b = -0.15$, $SE = 0.065$, $p = 0.020$). Finally, youth who were enrolled in postsecondary education at wave five were less likely to be incarcerated at waves six/seven ($b = -0.11$, $SE = 0.05$, $p = 0.037$).

Reciprocal relationships between key constructs were found in four models. A strong school bond at wave one significantly predicted less school misconduct at time two ($b = -0.06$, $SE = 0.03$, $p = 0.042$), and vice versa ($b = -0.15$, $SE = 0.03$, $p = 0.000$). School bond at wave one also significantly predicted not engaging in delinquency at wave two ($b = -0.16$, $SE = 0.03$, $p = 0.000$) and vice versa ($b = -0.12$, $SE = 0.03$, $p =$

0.000). Delinquent behavior at time two significantly increased the odds of school exclusion at waves three/four ($b = 0.14$, $SE = 0.04$, $p = 0.001$) and vice versa ($b = 0.08$, $SE = 0.03$, $p = 0.007$). Lastly, youth who were employed at wave five were less likely to be incarcerated at waves 6/7 ($b = -0.22$, $SE = 0.04$, $p = 0.000$) and vice versa ($b = -0.10$, $SE = 0.04$, $p = 0.004$).

Turning to effects that were not supported in the proposed direction, but were significantly related in the opposite direction, there were three relationships found. While dropout at waves three/four did not influence employment or romantic relationships at wave five, or offending at waves six/seven, employment ($b = 0.13$, $SE = 0.05$, $p = 0.02$) and romantic relationships ($B = 0.21$, $SE = 0.04$, $p = 0.025$) at waves three/four and offending at waves three/four ($B = 0.08$, $SE = 0.04$, $p = 0.040$) did significantly increase the odds that a youth dropped out at waves five and six/seven, respectively.

Table 17. Cross-Lagged Panel Models between Key Constructs

| | Std. b | SE | <i>p</i> |
|---|---------------|-----------|-----------------|
| Proposed Direction | | | |
| B → DO | -0.17 | 0.05 | 0.00*** |
| DO → B | 0.01 | 0.02 | 0.60 |
| SM → SE | 0.19 | 0.04 | 0.00*** |
| SE → SM | 0.05 | 0.03 | 0.07 |
| SE → PE | -0.15 | 0.07 | 0.02* |
| PE → SE | -0.14 | 0.08 | 0.10 |
| PE → I | -0.11 | 0.05 | 0.04* |
| I → PE | -0.07 | 0.05 | 0.13 |
| Reciprocal Relationship | | | |
| SB → SM | -0.06 | 0.03 | 0.04* |
| SM → SB | -0.15 | 0.03 | 0.00*** |
| SB → D | -0.16 | 0.03 | 0.00*** |
| D → SB | -0.12 | 0.03 | 0.00*** |
| D → SE | 0.14 | 0.04 | 0.00*** |
| SE → D | 0.08 | 0.03 | 0.01** |
| E → I | -0.22 | 0.04 | 0.00*** |
| I → E | -0.10 | 0.04 | 0.00** |
| Alternative Direction | | | |
| DO → E | 0.02 | 0.04 | 0.54 |
| E → DO | 0.13 | 0.05 | 0.02* |
| DO → R | 0.01 | 0.04 | 0.87 |
| R → DO | 0.21 | 0.05 | 0.03* |
| DO → O | 0.05 | 0.03 | 0.15 |
| O → DO | 0.08 | 0.04 | 0.04* |
| Abbreviations: SB = School Bond, SE = School Exclusion, PE = Postsecondary Education, DO = Dropout, D = Delinquency, SM = School Misconduct, E = Employment, R = Romantic Relationship, O = Offending, I = Incarceration. | | | |
| <i>p</i> < .05*, <i>p</i> < .01**, <i>p</i> < .001*** | | | |

Table 17. Cross-Lagged Panel Models between Key Constructs, cont'd

| | Std. b | SE | <i>p</i> |
|-----------------|---------------|-----------|-----------------|
| No Relationship | | | |
| B → SE | -0.07 | 0.04 | 0.08 |
| SE → B | 0.00 | 0.03 | 0.89 |
| SM → DO | -0.07 | 0.07 | 0.27 |
| DO → SM | 0.02 | 0.02 | 0.29 |
| D → DO | 0.18 | 0.10 | 0.08 |
| DO → D | 0.17 | 0.21 | 0.42 |
| SE → E | -0.07 | 0.04 | 0.07 |
| E → SE | -0.02 | 0.06 | 0.69 |
| SE → R | -0.05 | 0.04 | 0.23 |
| R → SE | -0.03 | 0.06 | 0.60 |
| SE → O | 0.07 | 0.04 | 0.06 |
| O → SE | 0.05 | 0.06 | 0.39 |
| SE → I | 0.07 | 0.04 | 0.13 |
| I → SE | -0.04 | 0.06 | 0.56 |
| DO → PE | -0.06 | 0.05 | 0.25 |
| PE → DO | -0.08 | 0.05 | 0.14 |
| DO → I | 0.03 | 0.04 | 0.44 |
| I → DO | 0.06 | 0.04 | 0.14 |
| E → O | -0.02 | 0.04 | 0.52 |
| O → E | -0.01 | 0.04 | 0.77 |
| PE → O | -0.06 | 0.04 | 0.12 |
| O → PE | 0.07 | 0.04 | 0.09 |
| R → O | -0.01 | 0.04 | 0.75 |
| O → R | 0.06 | 0.04 | 0.08 |
| R → I | -0.06 | 0.04 | 0.18 |
| I → R | -0.03 | 0.04 | 0.43 |

Abbreviations: SB = School Bond, SE = School Exclusion, PE = Postsecondary Education, DO = Dropout, D = Delinquency, SM = School Misconduct, E = Employment, R = Romantic Relationship, O = Offending, I = Incarceration.

$p < .05^*$, $p < .01^{**}$, $p < .001^{***}$