

## ABSTRACT

Title of Dissertation: COMMUNITY CHANGE, SCHOOL DISORDER, SCHOOL SOCIAL BONDS, AND YOUTH GANG INVOLVEMENT

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Kirk and Laub (2010) observed that community effects on crime should be studied as dynamic processes as communities change. The present research examined schools' role in regulating youth behavior and how community change affects school climate (School Disorder and School Social Bonds; SSB) using social disorganization and social bonds theories. G. Gottfredson, Gottfredson, Czeh, Cantor, Crosse, and Hantman (2000) collected data from a large, national probability sample of schools to examine youth gang problems and school-based intervention and prevention programs. I examined a subsample ( $N = 269$ ) of these schools. Variables were collected from school rosters and self-report questionnaires. School variables were modeled as latent variables derived from the variance in student responses that is attributed to the school to which the student belonged. Community variables were constructed from the 1990 and 2000 Census data. Multilevel latent variable structural modeling allowed for the examination of individual and community effects on self-reported gang participation. I argued that school

characteristics were related to its community's characteristics, and that school variables contributed to student-reported gang involvement. School characteristics were also hypothesized to mediate the relation between community change and a student's likelihood of gang involvement. Some hypotheses were supported by this research. Findings lend support for the extension of social bonds theory to the school-level. Significant student predictors of the probability of gang involvement included Personal Victimization, Social Bonds, Fear, minority status, and age. At the group-level, SSB and School Disorder explained significant variance in gang involvement in the hypothesized directions, net of all other variables already in the model. A partial mediation of the relationship between School Disorder and the likelihood of gang involvement by the student variables was found. The community change variables were somewhat independent of the school characteristics measured. School-based gang prevention efforts may benefit from a climate characterized by prosocial bonds and low social disorganization, especially for schools in communities that have high levels of concentrated disadvantage and communities projected to experience demographic change. Practical applications of these findings in schools include smaller student-to-teacher ratios and implementing rules that are fair and clear.

COMMUNITY CHANGE, SCHOOL DISORDER, SCHOOL SOCIAL BONDS, AND  
YOUTH GANG INVOLVEMENT

by

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## List of Abbreviations and Acronyms

CABs = Crimes and analogous behaviors

CD = Concentrated Disadvantage

ESB = Effective School Battery

FCR = Fair and Clear Rules (student-level latent variable)

HLVSM = Hierarchical latent variable structural modeling

NCVS = National Crime Victimization Survey

RH = Racial Heterogeneity

RMSEA = Root mean square error of approximation

SFCR = School Fair and Clear Rules (school-level latent variable)

SRMR = Standardized root mean squared residual

SSB = School Social Bonds

WAY = What About You?

WLSMV = Weighted least squares means and variances

YC = Youth Composition

## **Community Change, School Disorder, School Social Bonds, and Youth Gang Involvement**

Over one fifth of the students surveyed in the 2007 National Crime Victimization Survey reported gang presence in their schools (NCVS; Robers, Zhang, & Truman, 2010). Using a nationally representative sample of schools to describe youth gangs and school-based gang prevention and intervention programs, G. Gottfredson and Gottfredson (2001) found that 7.1% of male and 3.6% of female secondary school students reported participating in gangs within the last 12 months. Of those who self-reported gang involvement, 35% were female. Girls are proportionately underrepresented in gang membership, although gang participation is still a problem among girls.

The presence of youth gangs in communities and schools poses special problems because of the high rates of delinquent behavior exhibited by gang-involved youths (G. Gottfredson & Gottfredson, 2001; Thornberry, 1998). For instance, the odds that a secondary school student reports carrying a hidden weapon are 10.5 times for gang boys than for non-gang boys and the odds that a gang-involved boy reports hitting or threatening to hit a teacher or other adult at school are almost 13 times the odds for a non-gang boy (G. Gottfredson & Gottfredson, 2001).

Still, the public's concern about school violence has declined: The percentage of 12 to 18 year-old students who reported fear of school violence decreased by seven percentage points from 12% in 1995 to 5% in 2007 (Robers et al., 2010). Although the public is less fearful of school violence, we continue to care about the related issue of school quality. More violent schools have a more difficult time recruiting good teachers and retaining high-achieving students (Boyd, Lankford, Loeb, Ronfeldt, & Wyckoff,

2010; G. Gottfredson, Gottfredson, Gottfredson, & Jones, 2003). In turn, families that have the means to move away from failing schools may do so, leaving behind a community with fewer resources. The cumulating effect would be a decreasing level of social organization and concentrated disadvantage at these schools and their surrounding communities. Communities characterized by social disorganization have been found to have higher crime rates and residents who feel less safe in their communities (Katz, Webb, & Armstrong, 2003; Shaw & McKay, 1942).

Students who feel unsafe in school are more likely to join gangs (G. Gottfredson & Yiu, 2011), perhaps spurred by a misguided notion that they would be protected. Youth gang members, by definition, engage in delinquent behaviors. In particular, violence and other forms of delinquent behavior such as criminal activity are elevated during the time youths are affiliated with a gang (Esbensen & Huizinga, 1993; Gordon et al., 2004; Melde & Esbensen, 2011; Thornberry, Krohn, Lizotte, & Chard-Wierschem, 1993). Furthermore, prior criminal behavior is the best predictor of criminal offenses (Hirschi, 2004), so preventing gang membership may help reduce crime rates. Thus, despite decreasing rates of school violence and students who reported personal fears of school violence across the U.S., youth gangs continue to exist and pose a problem to the communities in which they persist.

Severed social bonds can decrease the community's ability to regulate its youths, resulting in diminished restraints against engaging in deviant behaviors. Such effects may be even greater for communities which have more growth in their adolescent population. These considerations motivated the present study. Schools are important social institutions where adolescents experience social control. Schools have the potential to

prevent youth gang involvement by providing their students with prosocial bonds in an orderly environment. The present research investigates the role of schools in managing youth behavior. Findings may provide information for school administrators in how to target their efforts in preventing students from delinquency. This study is on schools' social control and organization on students' self-reported gang participation, and how school characteristics are affected by changes in the school's community.

### **Defining Gangs**

Several definitions of gangs have been proposed by gang researchers. The National Criminal Justice Reference Service (2010) defined gangs as “a group of three or more individuals who engage in criminal activity and identify themselves with a common name or sign.” Klein and Maxson (2006) proposed that “a street gang is any durable, street-oriented youth group whose involvement in illegal activity is part of its group identity” (p. 4). Along the same lines, survey respondents on the National Youth Gang Survey (NYGS; Wilson, 2000) were asked to respond to questions on gang-related issues using the definition that youth gangs are “a group of youths or young adults in your jurisdiction whose involvement in illegal activities over months or years marks them in their own view and in the view of the community and police as different from most other youthful groups. Do not include motorcycle gangs, hate or ideology groups, prison gangs, or other exclusively adult gangs” (p. 42). Wilson reported that results from the 1998 NYGS showed that 50% of the law enforcement agencies in their sample primarily used the criterion of *youths who committed crimes together* to identify a gang. The second most common criterion for a youth gang was that it *had a name*—19% of the law enforcement agencies chose this characteristic as the most important criterion.

Taken together, the various descriptions of youth gangs converge on the notion that they are composed of youths who commit crimes together and who are identified by its members *and* non-members as an entity based on personalized demarcations. Gottfredson and Gottfredson's (2001) defined a gang as "a somewhat organized group, sometimes having turf concerns, symbols, special dress or colors. A gang has a special interest in violence for status-providing purposes and is recognized as a gang by its members and by others" (p. 4). In the present study, students were asked to report if they "belonged to a gang that has a name and engages in fighting, stealing, or selling drugs" in the past 12 months.

Most research and law enforcers use self-claimed gang membership as the criterion to determine the individual's gang status (Esbensen, Winfree, He, & Taylor, 2001). Esbensen et al. studied the criterion-related validity of self-reported gang membership as a measure of actual gang membership. Using five increasingly restrictive definitions of gang status, Esbensen et al. found that the demographic compositions of age, sex, and ethnicity were similar among the five definitions of gang membership in a national sample of youth who claimed to be a gang member. In general, self-reported gang involvement is a robust measure of actual gang involvement (Esbensen et al., 2001).

### **Predictors of Gang Involvement and Delinquency**

Behaviors result from interactions between individuals and their environments. For example, youths who possess all the personal characteristics associated with gang involvement will not join a gang if gangs do not exist in their community. Past research has consistently supported the interpretation that both individual traits and structural elements in communities lead to differential rates of crime and delinquency.

## Individual Characteristics

Certain individual characteristics contribute to youth propensity for gang membership. For example, Gordon et al. (2004) investigated whether boys with a tendency toward delinquency were more likely to participate in gangs. Using a longitudinal design that followed two samples ( $N = 858$ ) of male public school students in Pittsburgh, Pennsylvania who were in the first ( $n = 503$ ) or fourth ( $n = 355$ ) grade during wave one of the study, Gordon et al. found that boys who joined gangs were already engaging in more delinquent behaviors than their peers before their gang involvement<sup>1</sup>.

A person's age is a strong predictor of delinquency as well. According to the arrest data in 2009 provided by the U.S. Department of Justice, Bureau of Justice Statistics, arrest counts for all offenses in the population increased as the age group increased and peaked at the 21-24 years age group. Thereafter, the arrest count steadily decreased. In all, individuals between the ages of 14 and 24 accounted for about 47% of arrests for all offenses. M. Gottfredson and Hirschi (1990) showed that this relation between age and crime holds for separate gender and race subgroups. Furthermore, at all ages, those who have been arrested tend to engage in more deviant behavior throughout all points in life compared to their peers. In other words, although the age gradient is similar across groups, the elevation of the age curve differs when the groups are categorized according to individual arrest history.

African American and Hispanic youths are more likely to be involved in gangs than are Whites and Asians (Esbensen et al., 2009; G. Gottfredson & Gottfredson, 2001).

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<sup>1</sup> Differences in coefficients obtained from a random effects negative binomial regression model between boys *before joining a gang* and those who *never joins a gang* for self-reported counts of acts of (a) aggression, (b) violent delinquency, and (c) property delinquency ranged from .4 to .6.

This effect of race/ethnic self-identification on individual gang participation remained even after accounting for school and community characteristics in G. Gottfredson and Yiu's (2011) study. The odds of gang participation for Hispanic and Black students were more than twice the odds of gang participation for White students when student (gender, age, perceived fairness of school rules, perceived clarity of school rules, commitment to education, belief in rules, personal victimization, and sense of safety) and school/community characteristics (concentrated disadvantage, family instability, immigration and crowding, percent of students in gang, fairness of school rules, clarity of school rules, students' commitment to education, students' belief in rules, student victimization, and student safety) were held constant.

**Social bonds.** According to Hirschi (1969), restraint against delinquency rather than the generation of delinquency is what requires explanation. Hirschi argued that social bonds restrain people from delinquent behavior. He suggested that whether or not a youth abides by prosocial norms depends on the adolescent's level of attachment to prosocial others, commitment to conventional goals, involvement in prosocial activities, and beliefs about deviant acts. Thus, consistent with findings that youths who do not believe in conventional rules were more likely to self-report gang membership (Esbensen, Peterson, Taylor, & Freng, 2009; Fagan, 1989; G. Gottfredson & Gottfredson, 2001; Hirschi, 1969; Loeber et al., 2003; Thornberry, Krohn, Lizotte, Smith, & Tobin, 2003), youths who are not socially bound to prosocial others are less likely to display prosocial behaviors. In other words, they are free to engage in delinquent behaviors. It is well established that youths with low commitment to education and little belief in conventions

are likely to report gang participation (Esbensen et al., 2009; Fagan, 1989; G. Gottfredson & D. Gottfredson, 2001; Loeber et al., 2003; Thornberry et al., 2003).

Later, M. Gottfredson and Hirschi (1990) included self-control as part of a general theory of crime. They began by examining the nature of crimes and then conceptualized the individuals who would likely engage in them. Instead of theorizing about *crime* specifically, which is bound by the definition that it is an illegal activity, M. Gottfredson and Hirschi included crimes *and* analogous behaviors (CABs; i.e., actions that share the same predictors as crimes, such as truancy, cheating on tests, and car accidents). Specifically, they conceptualized CABs as behaviors that offer easy, simple, and immediately available rewards. Such behaviors require little skill or planning, and bring discomfort to the victims. Generally, CABs bring immediate gratification coupled with maladaptive long-term outcomes that actually outweigh the present rewards. M. Gottfredson and Hirschi theorized that people with lower self-control tend to engage in CABs because they tend not to consider the entire scope of potential costs of a behavior—“crimes practically define failure of self-control” (Hirschi, 2004, p. 540). Those with low self-control have little interest in long-term career pursuits and may not value cognitive or academic skills (M. Gottfredson & Hirschi, 1990). As a result, these individuals would have exhibited low commitment to education.

M. Gottfredson and Hirschi argued that one’s level of self-control is affected primarily by childrearing practices. The theory explains low self-control as a result of ineffective or incomplete socialization through childrearing. In order for an individual to develop self-control, the adults who care for and are personally invested in this child must be able to (a) monitor the child’s behaviors, (b) recognize any deviant behaviors

that the child may display, and (c) punish such behaviors to decrease their frequency. Thus, in the absence of such restraints against delinquency, these individuals do not develop an appreciation of conventional rules.

M. Gottfredson and Hirschi's (1990) general theory of crime contrasts with other theories that claim individuals are biologically predisposed to criminality, have orderly criminal careers, or act rationally; and with theories that view crime as a social construction. Instead of being an effect of training, socialization, or learned behavior, low self-control simply surfaces in the absence of nurturance and discipline. Their theory that this stable individual trait of self-control causes crime and analogous behaviors has attracted criticism. For example, Grasmick, Tittle, Bursik, and Arneklev (1993) suggested that the theory is a mere tautology (i.e., predicting crime from crime itself). Yet, support for this parsimonious general theory exists (e.g., Evans, Cullen, Burton, Dunaway, & Benson, 1997; Pratt & Cullen, 2000). Pratt and Cullen's meta-analysis found robust support for social control variables in explaining CABs. They indicated that the effect sizes of self-control are among the strongest reported in the literature.

Consolidating the social bonds and self-control theories, Hirschi (2004) reframed self-control as "the set of inhibitions one carries with one wherever one happens to go" (p. 543). Consistent with social bonds theory, individuals are regulated by others' opinions. People's actions are guided by how they perceive they will be judged by important others. Thus, a person's social bonds, such as attachment to prosocial others, commitment to conventions, and beliefs about deviance, affect the person's odds of engaging in CABs.

**Fear.** At the individual level, youths who self-reported a lower sense of safety in school were more likely to report being involved in a gang (G. Gottfredson & Yiu, 2011).

McDermott (1980) suggested that a sense of safety is an environmental need that must be met in order for learning to occur, and that fear of victimization in schools would affect students' ability to concentrate and to learn. According to this line of reasoning, fearful students might be less committed to education and feel less attached to the school. In theoretical terms, at the individual level, a low sense of safety may be associated with decreased social bonding (commitment and attachment to school), thereby reducing the student's sources of restraints against delinquency.

In contrast, Melde, Taylor, and Esbensen (2009) suggested that gang membership may actually be associated with lower levels of fear. In their two-year study, Melde et al. obtained a sample of 1,450 students who could be categorized into one of the following groups: (a) gang-involved at year-1 and year-2, (b) gang-involved at year-1 but not at year-2, (c) not gang-involved at year-1 but gang-involved at year-2, and (d) not gang-involved at year-1 or year-2. They reported that students who were gang-involved at both time points reported the highest frequency of victimization experiences; however, this group also reported the largest decrease in the level of fear from year-1 to year-2 out of the four groups. Melde et al. suggested that gangs may serve a protective function for its members emotionally because the source of fear becomes known (e.g., rival gangs, gang-related violent rituals) and therefore controllable, as opposed to fearing the unknown.

Decker and Curry (2000) investigated key reasons that adolescents aged 12 to 15 years from St. Louis, Missouri decided to join gangs. The researchers interviewed 533 adolescents individually at their schools, 18% of whom self-identified as gang-involved. Of these 96 gang-involved youths, the most frequent reason for joining a gang was a sense of community, as indicated by wanting to protect their neighborhood. Decker and

Curry found that instrumental reasons for gang membership existed as well. One such reason was seeking protection against physical violence. This perspective, however, frames these juveniles as rationally choosing to be in a gang. Examining real-world statistics, delinquents are not rational (M. Gottfredson & Hirschi, 1990). Instead, they commit deviant acts to gain immediate rewards without exerting much effort (discounting distal rewards). The theory of a calculating delinquent is not supported.

**Victimization** experience has been found to correlate with gang membership (Melde, Taylor, & Esbensen, 2009; Peterson, Taylor, & Esbensen, 2004). T. Taylor, Peterson, Esbensen, and Freng (2007) described self-report results for eighth grade students from 42 schools in 11 U.S. cities. The survey included three items to assess whether the youths have experienced violent victimization in the past 12 months, from simple assault to more serious victimization including aggravated assault and robbery. In their sample, 522 students reported they were currently involved in a gang and 5,226 did not report current gang membership. Forty-eight percent of the entire sample reported experiencing any kind of the three victimization events, and 15% reported experiencing assault or robbery victimization. A higher percentage of gang members were victimized in the past 12 months than were non-gang members (70% versus 46%), and gang members also experienced more *incidents* of victimization. Comparisons of victimization experiences of gang versus non-gang youths were also reported by G. Gottfredson and Gottfredson (2001). In their study, compared to non-gang boys, gang-involved boys were more than twice as likely to have been physically attacked (33% versus 16%), almost four times as likely to have been robbed of items worth more than \$1 (23% versus 6%), and more than five times as likely to have been threatened with a knife or gun (28%

versus 5%). As for gang-involved girls, they were five times more likely to have been forced to hand over items worth less than \$1, almost six times as likely to have been robbed by force, weapons, or threats (17% versus 3%), almost three times as likely to have been threatened with a beating (31% versus 13%), and nine times as likely to have been threatened with a knife or gun (18% versus 2%), compared to non-gang girls.

Holding constant demographics, self-control, family processes, and self-reported delinquency, T. Taylor et al. (2007) observed a 26% lower odds of general violent victimization for gang members compared to non-members, but a 50% higher odds of having experienced a serious violent victimization event for gang members compared to non-gang members. Referencing Decker's (1996) study, T. Taylor et al. hypothesized that gang involvement provided a collective protection for gang members against less serious violent victimization because of a common threat of violence from rival gangs, but that when violence does occur, it is likely to be more serious.

### **Community Characteristics**

**Social organization.** Shaw and McKay's (1942) theory of social organization alerted scientists to how community structural variables (low socioeconomic status, ethnic heterogeneity, and residential mobility) disrupt community social organization, which in turn affects crime rates. In support of this theory, Shaw and McKay found that communities characterized by high poverty and residential instability tended to have higher crime rates. These communities have also been found to have a higher prevalence of physical disorder such as graffiti that deface public facilities, dilapidated and abandoned buildings, and vandalism (R. Taylor, 1999).

Residents of more disorderly neighborhoods have been found to be more fearful of victimization than residents who lived in less disorderly neighborhoods (Ross & Jang, 2000). This is important because fear is associated with youth gang participation (G. Gottfredson & Yiu, 2011). Katz, Webb, and Armstrong (2003) found that the positive association of physical disorder and fearfulness was greater for fear of gangs specifically than for fear of crimes in general in a sample of 800 households in a Southern city, half of which were located in an area with high gang activity. Ross and Jang theorized that physical disorder increased fear via its negative effect on local social bonds. Thus, ecological characteristics may have indirect effects on gang membership in addition to direct effects.

**Informal social control** involves the amount of supervision afforded to youths at the community level. Social control occurs via the discipline, supervision, and attachment to society (Sampson & Laub, 1994) that adults pass on to younger generations, forming social norms. According to this view, without effective parenting and supervision (e.g., monitoring children's behaviors and punishing misbehaviors fairly and lovingly), children and adolescents will not develop prosocial norms and attitudes. Going a step further, Sampson and Groves (1989) argued that proper management of youths is important because delinquency is a group phenomenon that derives from unsupervised peer groups. Using Kasarda and Janowitz's (1974) systemic model framework, Sampson and Groves proposed that formal and informal social bonds in the community would increase a community's collective efficacy in controlling its youths, thereby decreasing crime and delinquency. Thus, Sampson and Groves married Shaw and McKay's social organization theory and Kasarda and Janowitz's systemic model to suggest that

intervening variables of social disorganization (i.e., informal social control) mediate the effects of community structural variables on crime and delinquency. Sampson and Groves argued that the structural characteristics of a community (e.g., concentrated disadvantage, residential mobility, racial/ethnic heterogeneity, family disruption, and urbanization) affected the ability of the community to exert control as a collective over its youths. For instance, communities characterized by low SES have fewer resources to establish and maintain formal and voluntary organizations, heterogeneous communities may stimulate mistrust and fear among neighbors, and communities with many single-parent-headed families have more unsupervised youths. All of these effects would cumulate in low levels of the community's informal social control over its youths, thereby weakening the inhibiting factors that restrain youths against delinquency.

In support of their theory, Sampson and Groves (1989) found that the community characteristics included in Shaw and McKay's concept of Concentrated Disadvantage were associated with indicators of Social Disorganization (local friendship networks, unsupervised youths, and organizational participation) in the communities. As expected, controlling for the other predictors, communities with higher socioeconomic status were less likely to have unsupervised youths (standardized  $\beta = -.34$ ), and those characterized by family disruption (standardized  $\beta = .22$ ) and ethnic heterogeneity and urbanization (standardized  $\beta = .15$ ) were more likely to have unsupervised youth groups. Communities with higher residential stability were associated with denser friendship networks (standardized  $\beta = .42$ ) but urbanization predicted sparser local friendship networks (standardized  $\beta = -.27$ ). Organizational participation was better predicted by community SES (standardized  $\beta = .17$ ) than by family disruption, ethnic heterogeneity/urbanization,

and residential mobility. This association is not surprising since more affluent communities may have more resources than less affluent communities to establish and participate in organized activities. What's more, Sampson and Groves showed that Social Disorganization mediated more than half of the effects of Concentrated Disadvantage on total victimization rates. Subsequently, Sampson, Raudenbush, and Earls (1997) found evidence that informal social control combined with social cohesion and trust within a neighborhood mediated the association between community structural variables (residential stability and disadvantage) and violence rates in the community.

Sun, Triplett, and Gainey (2004) set out to extend Sampson and Groves' (1986) social-disorganization-as-mediation theory and added the hypothesis that the social control indicators affected crime and delinquency rates via the presence of unsupervised youths. Sun et al. interviewed individuals 19 years and older from 36 neighborhoods in seven cities in the United States and aggregated responses to examine neighborhood-level structural models. The researchers found that residential mobility (standardized direct effect = .40,  $p < .10$ ) and family disruption (standardized direct effect = .79,  $p < .10$ ) but not socioeconomic status or racial heterogeneity in the neighborhood increased the extent to which respondents perceived unsupervised youths to be a problem in the neighborhood. Local social ties also had a significant negative standardized direct effect (-.44,  $p < .10$ ) on unsupervised youths. Organizational participation, on the other hand, had no significant associations with the other variables in the model. Furthermore, perceptions of unsupervised youths as a problem at the neighborhood level were associated with an increased assault rate (standardized direct effect = .39) but not the robbery rate in those neighborhoods. Ultimately, Sun et al.'s research showed that neighborhood-level

unsupervised youths mediated the relationship between residential mobility and assault rates, as well as the relationship between local social ties and assault rates. It is difficult to have confidence in the construct validity of Sun et al.'s measures of social disorganization. Their *local social ties* construct consisted of only one item (percentage of respondents reporting that their neighbors would do things together and help each other), *unsupervised youths* was measured using two items, and *organizational participation* assessed the percentage of respondents who were able to attend meetings about drug and crime problems.

**Legal cynicism** was described by Sampson and Bartusch (1998) as people's lack of belief in the legitimacy of the law and social norms—and they suggested that communities differ in their levels of legal cynicism. Sampson and Bartusch contended that legal cynicism is a construct separate from *tolerance* for deviance. Thus, *individuals* from communities characterized by legal cynicism are not necessarily more tolerant of deviance than their counterparts who live in less legally cynical communities. Rather, these individuals simply come to view deviance as a way of life regardless of their moral attitudes toward such behavior. Furthermore, Sampson and Bartusch challenged the belief that individual minority persons and individuals of lower SES had higher tolerance of violence. They instead argued that people's general attitudes toward norms and deviance are similar regardless of race or social class, but that the structural characteristics of the community in which people reside influence their reactions to crime and delinquency, as well as their attitudes toward the effectiveness of the police. More specifically, people in socially disorganized communities experience communication difficulties due to the lack of trust and heterogeneity characteristic of these communities. This failure of neighbors

to communicate effectively then impedes the pursuit for common, prosocial norms. Thus, people in these communities come to expect violence in daily living.

Sampson and Bartusch's (1998) multilevel research using interviews of 8,782 adults in 343 neighborhoods in Chicago showed support for their hypotheses. At the individual level, African Americans and Latinos were found to be less tolerant of deviance and physical violence in youths than Whites. Although at the individual level, African Americans reported higher legal cynicism (e.g., "Laws were made to be broken," "It's okay to do anything you want as long as you don't hurt anyone," p. 786) than Whites, when the community characteristic of concentrated disadvantage (poverty, welfare, female-headed families with children, percentage under 18 years old, percentage Black) was added to the multilevel model to predict legal cynicism, this individual-level difference between African Americans and Whites was reduced to non-significance, whereas the concentrated disadvantage community factor contributed to respondents' feelings of legal cynicism, net of all other individual- and community-level predictors.

Taking a different approach, Kirk and Matsuda (2011) focused on the legal aspects of legal cynicism and measured it using three items that gauged respondents' perceptions of the police's effectiveness in preventing crime and maintaining order, in addition to the belief that "laws are made to be broken" (p. 454). Kirk and Matsuda used a random sample of 1,071 individuals between 15 and 18 years old from a dataset that consists of a stratified, random sample of  $N = 80$  from the 343 neighborhoods in Chicago to model the community effects of legal cynicism and collective efficacy on the probability of arrest after a crime, accounting for individual and family characteristics as well as other neighborhood effects. Kirk and Matsuda's research lent support to the

hypothesized relationship between level of legal cynicism in the community and its arrest rates using Poisson regression. In particular, using community legal cynicism to predict frequency of arrests at the individual level and holding other individual, family, and neighborhood characteristics constant, individuals who lived in communities with higher levels of legal cynicism were more frequently arrested, on average, than people who lived in communities with lower legal cynicism. On the other hand, holding the same covariates constant, an interaction effect existed such that for those who self-reported having committed a crime, the frequency of them being arrested was lower if the respondent lived in communities characterized by higher levels of legal cynicism than those offenders who resided in other communities. Thus, in communities characterized by higher levels of legal cynicism, citizens reported committing more crimes and having more arrests, but they are more likely to escape arrests for a particular offense that they have committed when compared to offenders in communities with lower levels of legal cynicism. This observation that offenders more frequently escape law enforcement may be why residents of these communities feel legal cynicism—that social control as enforced by the police is ineffective in deterring crime. It may be that in highly legally cynical communities, rates of deviance would largely depend on social control exerted by the family or other community institutions, such as the school.

### **School Characteristics**

**School social bonds (SSB)** is the previously described social bonds construct extended to the school level; it is the aspect of school climate that regulates student behavior through providing an environment that values prosocial pursuits (or not). Thus, SSB is indicative of a school's ability to restrain its students against delinquency.

**Fair and clear rules.** The perceived fairness and clarity of school rules at the school level is reflective of the school's discipline effectiveness. If schools do not work to protect students via rules or regulations, this failure is like communities' legal systems not working. The school's discipline management may also be conceptualized as the amount of supervision and monitoring afforded to students. From the informal social control perspective, a school that enforces fair and clear rules would be better able to restrain its students against delinquency by facilitating the communication of expected norms and values. Prior ecological research (G. Gottfredson, Gottfredson, Payne, & Gottfredson, 2005) lent evidence that a *Discipline Management* factor (a composite of fairness and clarity of rules based on student reports) was strongly inversely related to schools' overall student delinquency and moderately inversely related to student victimization. The same study found that a *Psycho-Social Climate* factor (a composite of organizational focus, morale, planning, and administrative leadership based on teacher reports) was *not* related to student delinquency or victimization.

**School organization and school disorder.** Using a national sample of students and teachers, Payne, Gottfredson, and Gottfredson (2003) investigated the relationship between school social organization and school disorder. Payne et al. characterized schools as a community if their students and teachers reported common goals and norms, as well as supportive relationships among teachers, administrators, and students. They found that more communally organized schools experienced less student-reported delinquency and teacher-reported victimization. In the same study, Payne et al. also observed higher levels of prosocial bonding for students in schools that were more communally organized. Thus, compared to students in less communally organized

schools, these students were more committed to their education, more attached to their school, and more likely to believe in the legitimacy of norms and conventions.

Furthermore, Payne et al. showed empirically that student bonding mediated the relationship between the school's social organization and school disorder as indicated by the level of student delinquency. In other words, school organization is important in the prosocial bonding experience of its students which ultimately restrains students against delinquent behavior.

**Peers.** Classmates from the same school tend to compose the peer social networks of school-aged youths (Haynie, 2001). The role of peers in delinquent outcomes remains debated. Scholars from the socialization perspective (e.g., Akers, 1998) view peers as important social agents who provide the environment for youths to learn delinquent norms which encourage engagement in delinquency. Theorists who take the selection perspective (e.g., Hirschi, 1969) view delinquent youths as self-selecting into peer groups that are also delinquent, such that predicting delinquency from delinquent peer association is methodologically flawed because delinquency precedes association with delinquent peers. Taking both of these perspectives, interactional and developmental theorists (e.g., Thornberry et al., 1993) argued that delinquent peer associations and delinquency are bi-directionally related, such that young adolescents who are involved in delinquent activities find themselves in the company of other delinquent youths. Such delinquent company further reinforces antisocial norms and delinquent behavior, resulting in the youths' continued engagement in delinquency. Thornberry et al. added that a longitudinal research design is essential in studying the reciprocal relationship between youth delinquency and negative peer association. Still other researchers have

conceptualized peers as a source of opportunity that facilitates delinquency. Haynie and Osgood (2005), for example, argued that the amount of time spent with peers is directly related to the youth's likelihood to engage in delinquency.

A methodological issue exists in the measurement of peer delinquency. M. Gottfredson and Hirschi (1990) argued that self-reported measures of friends' delinquency are largely reflections of the respondent's own delinquency. Put another way, the explanatory and outcome variables measure the same construct. Haynie and Osgood (2005) constructed a peer delinquency measure using Add Health data. A sample of adolescents in grades seven through twelve was extracted for their study. Respondents nominated others who they considered as their friends. Haynie and Osgood identified a student's peer network by including all those nominated as friends, as well as others who nominated the student as a friend. Peer delinquency was then measured using friends' self-reported frequency of involvement in minor deviant acts (get drunk, smoke cigarettes, skip school, involvement in serious physical fights) and delinquency (graffiti, damage property, shoplift, steal, burglarize, steal a car, sell drugs, engage in a serious physical fight, seriously injure another, use/threaten to use a weapon, participate in a group fight, pull a knife or gun on someone, shoot or stab someone). Using this procedure, Haynie and Osgood found that the strength of the relationship between associating with delinquent peers and personal delinquency was no more powerful than that between social bonds and personal delinquent outcomes.

Unlike general theories of crime and analogous behaviors, my theory is specific to the delinquent behavior of gang involvement. Gang involvement, by definition, *is*

association with delinquent peers. For this reason, my theory does not include peer association in predicting gang involvement.

### **The Interdependence of Schools and Their Communities**

#### **Multiple Sources of Social Control**

School and community characteristics may be interdependent (Laub & Lauritsen, 1998) in perpetuating an undesirable cycle of school and community disadvantage. Kirk (2009) examined how school suspension and community arrest rates were influenced by the level of informal social control exerted by multiple contexts simultaneously. In his multilevel study, Kirk analyzed self-reports from a sample of 7,407 6<sup>th</sup> and 8<sup>th</sup> grade students plus 1,792 teachers from 68 schools in Chicago. Kirk used items that gauged family-, school-, and neighborhood-based social controls in a series of logistic regression analyses to predict whether or not an individual student was arrested or suspended by the school. Kirk's study supported a multicontextual approach to understanding the etiology of youth behavior. In particular, not only did Kirk find that levels of school- and neighborhood-based social control were negatively associated with suspension, but an interaction was found between the two sources of social control. Specifically, school-based social control had a larger effect on the odds of a student being suspended when it is in a neighborhood characterized by low social control versus a community with higher levels of neighborhood-based social control. Furthermore, an aspect of school bonding, student-teacher trust, was found to contribute additional variance to a student's odds of being arrested after neighborhood-based social control was accounted for. Thus, these school- and neighborhood-based social controls seem to work in concert to predict student delinquent outcomes.

G. Gottfredson and Yiu (2011) employed a multilevel modeling framework to assess the extent to which school and community characteristics influenced gang participation net of a variety of individual and other school and community risk factors. This research involved a large probability sample of secondary schools surveyed in 1998 and the 1990 U.S. Census data (most of which pertain to population and household status in 1989). As hypothesized, communities characterized by *concentrated disadvantage* (proportion of the population with a bachelor's degree [reversed], proportion of family in poverty, proportion of the population with less than four years of high school, proportion of the population with income below \$100K in 1989 or 1999, proportion of the population unemployed) and *family instability* (proportion of divorced persons, ratio of single-headed to married households with children, and low ratio of owned to rented homes) increased the odds of youths participating in gangs. When school characteristics were added to the model, the direct effect of community concentrated disadvantage disappeared and the perceived school-wide student commitment to education, school safety, and fairness of school rules predicted lower gang participation rates. These results implied that these school indicators of social control may mediate the effect of community structural characteristics on gang participation. The community's level of family instability was not mediated in the model that now included the school characteristics. That this community characteristic was not mediated, according to the model, was expected because there were no family measures included in the multi-level model. Community *immigration and crowding* (proportion of people who were foreign-born, did not speak English well, and six or more people per housing unit) and the school-aggregated percentage of students who reported experiencing school-related

victimization did not contribute significantly to students' self-reported gang involvement net of the other covariates.

When student-reported gang involvement was regressed on individual characteristics, net of school and community characteristics, G. Gottfredson and Yiu (2011) found that individual variables such as race, sense of safety, personal victimization, belief in rules, commitment to education, and perceived fairness of school rules predicted gang involvement. As expected, the findings implied that individual variables derived from Hirschi's (1969) social bonds theory (i.e., commitment to education and belief in rules) restrain against gang involvement. After adding these student characteristics to the model, community family instability and school-level perceived fairness of rules no longer made significant direct contributions to gang participation.

### **Social Organization in Schools and Communities**

G. Gottfredson, Gottfredson, Gottfredson, and Jones (2003) found that schools associated with communities characterized by higher levels of Concentrated Disadvantage also had a more difficult time staffing quality teachers. These schools also tended to be more disorderly. According to Sampson and Raudenbush (1999), social disorder occurs in the presence of behaviors considered as threatening (e.g., verbal harassment, noisy or unsupervised youth, etc.). In G. Gottfredson's (2012) account, disorderly schools in disadvantaged communities are trapped in a vicious cycle in which poor school climate, difficulty recruiting or retaining teachers, low student achievement, and poor public perception of schools interact with undesirable community structural characteristics. This cycle results in the continued concentration of environmental

disadvantage that magnifies or makes available the opportunities for local youths to have negative outcomes.

Using the informal social control perspective, disorderly schools may reflect the community's lack of control over its youths. As Gibbs, Simpson, and Corsaro (2008) argued, "schools reflect the community in which they are located to some degree, in demographic composition, resources and social organization" (p. 11). By the same token, the ability of teachers to exert informal social control over their students may reflect the ability of authority figures to exercise informal social control over youths outside of the school setting. Accordingly, school disorder, such as low levels of classroom order, may predict youth gang involvement, and may act as a mediator between community structural characteristics and gang membership.

The research cited above utilized social control and social disorganization theories in explaining crimes and analogous behaviors. Taken together, the literature supports an integrated, multi-level perspective in the study of delinquency, but little gang research is organized around these theories, or addresses the interdependence of schools and communities.

The next section considers *change* in community characteristics that can lead to increased likelihood of youth gang participation.

### **Community Demographic Change**

Kirk and Laub (2010) observed that community effects should be studied as dynamic influences on crime rates since community demography changes. Yet relatively little research has examined crime as a result of *changing* community factors. An even less researched area is how changes in the community affect gang involvement

specifically. A scientific understanding of why serious problems with gangs emerge in some communities and not in other communities that appear similar in some ways is required to formulate approaches to the prevention and control of crime.

In the early 20<sup>th</sup> century, Shaw and McKay (Shaw et al., 1929; Shaw & McKay, 1942) began to formulate a cultural transmission hypothesis wherein communities come to develop and transmit on a unique *character* that affects local norms and attitudes over time. In other words, in Shaw and McKay's formulation, a community's character is fairly stable and ultimately becomes a part of the social transmission. Thus, high crime social areas are expected to stay that way over time despite demographic changes. One of the major transformations that communities undergo involves change in its demography. Bursik and Webb (1982) investigated the extent to which demographic changes in communities were associated with changes in the communities' delinquency rates. Their study challenged Shaw and McKay's cultural transmission hypothesis. Bursik and Webb noted that critical historical events had not yet taken place at the time of Shaw and McKay's research, but when they *did* occur later, they may have affected crime and delinquency rates, requiring an update in the cultural transmission theory. To illustrate, Bursik and Webb referenced the dramatic racial compositional changes in Chicago during the late 1950s. From the late 1910s through 1950, Chicago's neighborhoods were segregated into White and Black communities. The intolerance of Black people in existing White neighborhoods gave rise to the "Black belt," a few areas in Chicago where Black people concentrated. With the 1948 Supreme Court decisions that rejected the notion of race-restrictive covenants in housing, however, Black people migrated to previously White neighborhoods in great numbers. In reaction, White residents who were

fearful or hostile toward Black residents began to out-migrate from these neighborhoods. Within a relatively brief period of time, the neighborhood has undergone dramatic changes in its ecology. Bursik and Webb computed residual change scores<sup>2</sup> over ten-year intervals for a block of ecological indicator variables (population size, proportion of foreign-born Whites, proportion non-White, and average household density level) to examine the relationship between these changes and delinquency rates as measured by referrals of males between 10 and 17 years old to the Chicago juvenile court during Census years from 1940 to 1970. They found support for Shaw and McKay's theory in the data from the earliest ten-year period only (1940-1950), a time that witnessed less instability in community demography than later decades. In later years, however, communities that experienced changes in their population makeup were more likely to have also experienced changes in delinquency rates.

Such major community change results from processes of in-migration and out-migrations due to historical reasons and gentrification (G. Gottfredson, 2012; Kirk & Laub, 2010; R. Taylor & Covington, 1988). G. Gottfredson described a situation in which Baltimore City experienced major shifts in racial compositions as Black Americans moved to the northern United States for new job opportunities after World War I. Later, schooling policies on segregation prompted middle-class and White Americans to move away from the city and into the surrounding suburbs, which left behind a city with increasing levels of concentrated disadvantage. R. Taylor and Covington (1993) proposed that community changes, especially rapid ones, act as destabilizing forces in a community,

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<sup>2</sup>Residual change score is the difference between the time-2 score for a community variable and the time-2 score predicted from the corresponding time-1 score for the community. It is therefore independent of the level of the community variable at time-1. In other words, it represents *change* from time-1 to time-2 and not the level of that demographic characteristic *at* time-1 or at time-2.

which would in turn increase people's fear of crime. Thus, rapid community change indirectly increases crime, because such change increases the level of social disorganization in the community. R. Taylor and Covington computed neighborhood change scores for various community characteristics in 66 neighborhoods in Baltimore City by regressing 1980 Census variables on the corresponding indicators from ten years earlier and using the residuals. Their principal components analysis of the residuals supported three factors they labeled as community changes in *minority/youth composition*, *economic status*, and *stability*. In addition to the residents' gender, these residual change factors were included as exogenous predictors in testing the mediation model that neighborhood racial composition, neighborhood physical disorder, and perceptions of unsupervised youth groups as a neighborhood problem intervene between ecological changes and residents' fear of crime. R. Taylor and Covington found that only changes in the minority and youth populations in the community showed a consistent, positive effect on fear of crimes in the analyses for two random halves of the sample, and that this was an indirect effect mediated by the neighborhood's racial composition. Although it is one of the few studies that examined the effect of ecological change on crime variables, R. Taylor and Covington's analyses failed to account for the clustering effects of individuals within neighborhoods, a design effect that can inflate standard errors. In other words, the statistical significance of findings might have been exaggerated. Furthermore, R. Taylor and Covington's factor of minority and youth composition makes it impossible to disentangle the separate effects of changes in race or youth composition in the population on fear.

### **Social Ecology and Gang Participation**

The foregoing review cites mostly work that focused on correlates of local crime rates. Taken as a whole, the effects of individual, school, and community characteristics contribute to youth problem behavior, although the specific mechanisms with respect to gang involvement are little studied. Some community variables such as the percentage of the population who is African American, presence of vacant lots, and population density have been found to correlate with higher chances of gang problems in a community (e.g., Kirk & Matsuda, 2011; Tita, Cohen, & Engberg, 2005), but we do not yet have a complete analytical account of the characteristics of communities that do and do not have gang problems.

#### **Present Study: An Integrated Theoretical Perspective**

The literature suggests value in examining both group-level (sociological) phenomena and individual-level (psychological) processes when studying adolescent gang participation. From the sociological perspective, community-based demographic characteristics such as racial ratios and social class have been found to be associated with crime rates. Extending this line of research, criminologists Sampson and Groves demonstrated that these community structural characteristics appear to lead to social disorganization in the form of decreased informal social control exerted over adolescents, which mediates community structural effects on victimization rates. In contrast, from a psychological perspective, theorists have introduced impulsiveness and family processes such as parenting practices as causes of crimes and analogous behaviors. Hirschi and M. Gottfredson (and subsequently, Laub and Sampson) have proposed integrations of some aspects of the sociological theories involving social control and social organization with

aspects of the psychological theories involving individual differences in personality and parenting practices.

Integrating sociological and psychological concepts, I use social organization and social bonds theories in explaining youth gang involvement. Different from theorists in the differential association and social learning tradition (e.g., Akers, 1998), social bonds theorists like M. Gottfredson and Hirschi view one's tendency to engage in delinquent behaviors as a relatively stable trait established early in life. This age-invariant effect at the individual-level has been supported in research (M. Gottfredson & Hirschi, 1990). Less is known about social bonds and delinquent outcomes at the group-level. Communities and schools are made up of individuals who come and go—communities' and schools' compositions change. It makes sense that group-level social bonds variables could change in accordance with changes in group demography. Social organization theory can be used to describe this phenomenon.

As suggested by Kirk and Laub (2010) and as evidenced by several studies (e.g., Bursik & Webb, 1982; R. Taylor & Covington, 1993), community change, especially rapid change, may affect crime rates and should be examined in gang research. Important demographic changes in the communities may include changes in its socioeconomic status, youth composition, and racial heterogeneity—features that are largely visible in neighborhoods. Such community changes may introduce instability into a community that weakens social networks among residents. Severed social bonds can decrease the community's ability to regulate its youths, resulting in diminished restraints against engaging in deviant behaviors. Such effects may be even greater for communities which

have more growth in their adolescent population. These considerations motivated the present study.

In the present research, I hypothesize and test sociological and psychological mechanisms by which a disorganized community loses control of its youths at the group (school and community) and individual levels. Figure 1<sup>3</sup> is a graphical representation of my theory, explicated below.

**Student demography.** Individual characteristics predict gang participation. These variables include the student's age, gender, and race.

**Psychological influences.** As social bonds theory suggests, at the root of deviant behaviors is a lack of social restraints against delinquent behavior; with sufficient levels of prosocial ties, youths will be restrained from engaging in delinquency. When youths are not attached to prosocial others, uncommitted to societal conventions, and do not believe in rules, they are freer to be involved in deviant acts. Thus, *social bonds* might be operationalized at the individual-level by the youths' belief in conventional rules, their commitment to conformity (e.g., commitment to education), and their attachment to conventional others or institutions (e.g., attachment to school). I hypothesize that low levels of individual social bonds results in increased likelihood of gang involvement.

M. Gottfredson and Hirschi (1990) also argued that effective parenting is crucial in the development of ties to social conventions. Watchful parents must recognize and punish deviant behaviors in their children in order to restrain them from being delinquent.

Parallel to the concept of legal cynicism, it is reasonable to suggest that ineffective discipline is associated with people's perceptions that they can get away with

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<sup>3</sup> Fair and Clear Rules at the individual and group level was later found to share large variance with the Social Bonds construct and excluded from analyses, as explicated later in the "results" section. Figure 1 (and other figures) omitted its representation to facilitate the interpretation of results.

misbehavior, resulting in little belief in rules. Schools are the primary social institution for many youths, thus their experience in the school setting may directly affect their development of social bonds, which then acts on the youth's odds of gang involvement. Without effective discipline in the school setting, youths may become less restrained from delinquency because they are not socialized to develop a sense of belief in rules. Effective discipline in school may be measured by students' perceived fairness and clarity of the school rules<sup>4</sup>.

G. Gottfredson and Yiu (2011) showed that individual students' sense of safety and victimization experience at school contribute to gang involvement. More fearful youth are more likely to be gang-involved. Although it has been argued that juveniles are not rationally acting individuals because they act on impulse (M. Gottfredson & Hirschi, 1990), when interviewed, youths claimed that they joined a gang for protection against physical violence (Decker & Curry, 2000). I hypothesize that more frequently victimized youths would be more fearful, increasing their likelihood of joining a gang for protection. Thus, I hypothesize that fear acts as a mediator between victimization and gang participation.

**Sociological influences.** I argue that *school social bonds* and *school disorder* are the primary driving forces at the school and community level that affect youth gang membership. This concept is an extrapolation of previous research that supported the

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<sup>4</sup> This formulation adds a perceptual/attitudinal variable (perceived school discipline effectiveness) as a contributor of restraint for the individual. Considerable literature exists on people's perceptions of certainty and celerity of punishment (where the research has been concerned with such things as perceptions of the likelihood of detection or of punishment). Generally, this is part of the deterrence theory that stems from the ideas of Beccaria (1764/1963) and is the basis for research by Nagin and Pogarsky (2001) and Paternoster (1989).

mediation of informal family social control between family structural variables and youth delinquency (Sampson & Laub, 1994). Just as family social bonds variables like parent-child attachment, maternal supervision, and erratic discipline which affect the family's ability to restrain its children against delinquency are related to the family's structural variables (e.g., single-parent household, married couple with children), community structural variables affect social institutions' ability to manage their youths. My argument is supported by Sampson and Groves' (1989) research that extended Shaw and McKay's (1942) model which showed mediation of the relationship between community structural variables and crime and delinquency by social disorganization. Working from the perspective that community characteristics are highly associated with school demography, I expect that the community's structural characteristics and rapid changes in these characteristics would affect the school's social organization as well as the school's ability to provide the social bonds that restrain its students from delinquent behaviors such as gang involvement.

*School disorder.* Since schools and their communities are interdependent, rapid change in community demography is expected to increase school social disorder, ultimately affecting its students' likelihood of joining a gang. Social disorder in the community describes an environment in which residents perceive an erosion of social control mechanisms which raises levels of fear among the residents (Bennett & Flavin, 1994). One indicator of such disorder, then, is fear. Research has shown that students who attend less safe schools are more likely to self-report gang participation than their counterparts (G. Gottfredson & Yiu, 2011). A lack of school safety is a manifestation of the school's disorderliness. Bennett and Flavin suggested that unattended disorder in the

environment lead people to perceive ineffective social control and that others do not care about the community. This perception causes people to become fearful. Social disorder in the schools might lead to gang participation because it increases fear at the individual level. In sum, school disorder is an environmental aspect of schools that is threatening to its inhabitants due to visible disorganization and/or a lack of safety.

***School social bonds (SSB).*** Extending Hirschi's (1969) social bonds theory to the group level, I propose that SSB is measured by the school's overall student belief in conventional rules, school-level student commitment to education, and overall student attachment to school. In short, I am proposing a group-level counterpart of Hirschi's social bonds theory. I expect that schools would be more able to restrain students from delinquency if their students held a common commitment to education, were attached to their school, and believed in rules. Put another way, SSB is an inhibitory influence stemming from schools that restrains youths from engaging in delinquency.

***School fair and clear rules.*** Also according to bonds theory (M. Gottfredson & Hirschi, 1990; Hirschi, 2004), effective adult monitoring helps to restrain youths' tendency toward delinquency by communicating prosocial norms and enforcing conventions. In the school setting, effective discipline would decrease the likelihood that students will participate in gangs because it implies effective adult monitoring, which contributes to increased levels of SSB. A school's overall student-perceived fairness and clarity of school rules is a measure of the school's discipline management.

***Community change.*** The present study examines how change in community demography affects the odds of individual gang participation via school characteristics. Change, especially rapid change, in community demographic composition may contribute

to an increase in school social disorder and a decrease in school social bonds. A second focus of this study is to examine the social bonds construct at the group level.

Although certain community factors predicted gang involvement in G. Gottfredson and Yiu's (2011) research, the community data came from the 1990 Census, representing the status of the community approximately eight years prior to the 1998 school surveys that were the source of information about gang participation. Would the same results hold if the 2000 Census data were used instead? Furthermore, the G. Gottfredson and Yiu study lacked a measure of change. Detailed data from the 2000 Census are now available. I characterized the demography of the communities served by the schools in 2000 (shortly *after* survey data were collected) and constructed measures of the community's structural changes (e.g., socioeconomic, age group, and racial group context changes) occurring over the period before the survey data were collected. Accordingly, census characteristics ten years apart were measured to capture these changes.

**Multilevel analysis.** I also extend prior research by constructing a multilevel latent variable model of gang participation to represent school and individual characteristics as latent variables in the context of my structural models. Using a multilevel framework, students' individual characteristics were expected to explain some variance in the probability of gang involvement. Then, an examination of the community and school characteristics in which the student resides—including change in those characteristics—was expected to explain additional variance in gang participation due to the environment.

**Hypotheses.** I aim to understand how community change affects gang participation. Consistent with prior research, I hypothesize that individual traits will account for significant variance in self-reported gang participation. I also hypothesize that community and school characteristics will account for variance in self-reported gang participation, but that the effects of school on the probability of gang involvement will be attenuated after accounting for student-level effects (i.e., the school effects will be mediated by the individual-level process). My specific hypotheses are as follows (also presented visually in Figure 1):

1. Students with higher levels of fear and victimization will have higher likelihoods of gang membership, after accounting for student sex, age, race/ethnicity, and social bonds.
2. Student fear will mediate the relationship between victimization and gang participation, after accounting for student sex, age, race/ethnicity, and social bonds.
3. Rapid change in community demography (concentrated disadvantage, youth composition, and racial heterogeneity) will increase School Disorder, after accounting for the effects of these community characteristics at time 1.
4. Rapid change in community demography (concentrated disadvantage, youth composition, and racial heterogeneity) will decrease School Social Bonds, after accounting for the effects of these community characteristics at time 1.
5. A student in a school with high School Disorder (disorderly classrooms, low teacher safety, high student fear) will more likely be in a gang, net of other school and community characteristics. This relationship is expected to be

attenuated after accounting for the effect of students' fear on gang involvement.

6. A student in a school with low School Social Bonds (belief in conventional rules, commitment to education, and attachment to school among student body) will more likely be in a gang, net of other school and community characteristics. This relationship is expected to be attenuated after accounting for the effect of student-level social bonds on gang involvement.

## **Method**

### **Sample**

G. Gottfredson et al. (2000) collected data from a large, national probability sample of schools to examine youth gang problems and school-based intervention and prevention programs. The sample included elementary, middle, and high schools from rural, suburban, and urban locations. The schools included public, private, or Catholic institutions. In the original study, a sample of 1279 schools was designed to describe schools in the United States. G. Gottfredson et al. sought to obtain completed student questionnaires from a probability sample of 50 students and teacher questionnaires from all of the teachers in participating secondary schools. Of 847 secondary schools asked to participate in surveys of students, 37% did so – greater cooperation was obtained from middle schools than from high schools, and rural schools cooperated more often than urban schools. In participating schools the mean student response rate was 76%. Of 847 secondary schools asked to participate in teacher surveys, 48% did so. In participating schools the mean teacher response rate was 78%.

The current study uses the sample of public secondary schools from this dataset—excluding private and Catholic schools to minimize variance between schools due to differences in school operations as a function of auspices. Private and Catholic schools experience very little violence or delinquency compared to public schools, requiring separate analyses (D. Gottfredson & Dipietro, 2011). Plus, only nine Catholic schools and 22 private schools were sampled in the G. Gottfredson et al. (2002) dataset. Less than 3% of non-public school students reported gang involvement ( $n = 28$  out of 769 in private schools and 5 out of 468 in Catholic schools). The current study sample includes  $N = 269$  public schools after excluding cases with missing data. Sampling weights were ignored and the sample may not be representative of a well-defined population. Table 1 displays the sampled students' demographic characteristics.

A veridicality index was computed based on the consistency of students' responses to the self-report. Only those students whose scores on a veridicality index implied that their responses were consistent were included in the analyses (see G. Gottfredson & Gottfredson, 2001, pp. 37-38, for an explanation of the veridicality index).

## **Measures**

**Individual characteristics.** Student-level variables were obtained from student self-report and school rosters. The following measures were selected for analysis.

***Gang involvement*** is measured with a single student-report variable (“In last year, have you belonged to a gang that has a name and engages in fighting, stealing, or selling drugs?” coded 1 for yes and 0 for no).

***Age*** is measured in years, ranging from age 9 or younger through age 18 or older.

**Race/Ethnicity** is an indicator for the student being in one of the racial groups positively associated with gang involvement as recorded in the school rosters (coded 1 for African American, Hispanic, Native American, or other; and 0 for Asian or White).

**Sex** was obtained from school rosters and coded 0 for female, 1 for male.

**Social Bonds** measures the student's restraints from delinquency. It is a latent variable measured by three composite scores. First, *commitment to education* is a 14-item scale score adapted from What About You?–Form DC (WAY–Form DC; G. Gottfredson & Gottfredson, 1999), which has been shown to be a robust predictor of delinquent behavior, drug use, and school performance. In the present study alpha internal consistency reliability coefficient is .80. Items include, “The grades I get in school are important to me” and “I won’t let anything get in the way of my school work.” Next, *belief in conventional rules* is a composite of 17 items adapted from the WAY–Form DC which has also been shown to be a robust predictor of delinquent behavior and drug use. In the present study alpha internal consistency reliability coefficient is .89. Items include, “I want to do the right thing whenever I can” and “It is all right to get around the law if you can” (reverse scored). The third composite score comes from the *attachment to school* 13-item scale adapted from the WAY-Form DC. Alpha internal consistency coefficient is .64 in this sample. Items include, “I like school,” “I like the principal,” and “I feel like I belong in this school.”

**Fear** assesses the student's feelings of fearfulness in school. It is a latent variable measured by nine items from a school safety scale adapted from the WAY–Form DC (G. Gottfredson & Gottfredson, 1999) and the Effective School Battery (ESB – devised to study schools and delinquency as well as school safety; G. Gottfredson, 1999). Students

indicated whether they usually stayed away from any of seven places in their school (each posed as a separate item) because someone might hurt or bother them there. These places included the shortest way to school or the bus, any entrances into the school, any hallways or stairs in the school, parts of the school cafeteria, any school restrooms, other places inside the school building, and other places on the school grounds. These items were scored such that a one indicated higher fear. In the present study alpha internal consistency reliability coefficient for the scale is .86. Using the item-to-construct balance approach (Little, Cunningham, Shahar, & Widaman, 2002), the nine items were assigned to three separate parcels of three items each as manifest measures of the Fear factor.

*Victimization* is measured by seven items from the WAY–Form DC (G. Gottfredson & Gottfredson, 1999) student questionnaire that describe the number of different types of victimization experienced by the student at school during the current school year. The individual-level alpha is .60. Using the item-to-construct balance approach (Little et al., 2002), the seven items were assigned to three parcels as manifest measures of the Victimization factor.

*Fair and Clear Rules* is a latent variable measured by three parcels derived from a seven-item scale adapted from the ESB (G. Gottfredson, 1999). The seven-item scale measures student perceptions of the fairness of school rules, authority figures, and rule enforcement, as well as the clarity of these rules. It includes items such as “The punishment for breaking school rules is the same no matter who you are” and “Everyone knows the school rules.” In this sample, coefficient alpha is .73.

**School and community characteristics** are expected to affect student gang participation. Community-level variables were constructed from the 1990 and 2000

census data for the zip code in which the school was located. In earlier research (G. Gottfredson et al., 2002), details of the attendance area for schools in this sample were laboriously geocoded using census maps, and data for block groups aggregated to the school level. Correlations between area characteristics based on zip code areas and block-group geocoded areas were very high, and the two methods produced correlations with school characteristics that rarely differed at all to two places beyond the decimal. Since the laborious procedure of geocoding the data provided no observable benefits over the readily available zip code data, zip code areas were used in the present research. School variables came from student and teacher reports.

Community variables were modeled as exogenous measured predictors. Three factor-based scores describe the baseline level of risky structural community characteristics that contribute to increased probability of gang involvement. In addition, three variables capture the amount of change the community underwent (relative to other communities in the sample). These variables are described below.

*Concentrated disadvantage* measures the community's level of impoverished and non-formally-educated population. It is a factor-based score derived from the sum of the z-standardized scores of the following variables: the proportion of the population above 24 years old with a bachelor's degree (reversed), the proportion of families in poverty, the proportion of the population above 24 years old with less than four years of high school, the ratio of households with income less than or equal to the median income level to those above the median income level, and the proportion of the population above 15 years old unemployed. This factor-based score was then standardized with a sample mean

of zero and standard deviation of one for use in the analyses to facilitate interpretation of the results.

The factor-based score was calculated for each of the two time points, and *concentrated disadvantage at time-1* was included as a predictor to estimate the baseline probability of gang participation attributable to the community's level of concentrated disadvantage. Next, the residual change score was calculated. The residual change score is the difference between the predicted and actual time-2 factor score based on a regression of the time-2 factor scores on the time-1 scores using the entire sample. This method captures variance in the dependent variables that is explained by rapid changes in this community structural characteristic after accounting for the variance due simply to baseline levels of concentrated disadvantage across the communities.

As Bursik and Webb (1982) argued, residual change scores are appropriate in measuring community change because while they take into account the initial community structure conditions by including time 1 scores in the regression procedure, "the distribution of the change scores [also] reflects the portion of the variance of the indicator at time 2 that is unrelated to the level of the indicator at [time 1, and so they] are statistically independent of the [time 1] levels of the variable" (p. 31). In other words, residual change scores indicate unexpected community change based on the time 1 observations across all the communities sampled (Bursik & Webb, 1982).

***Racial heterogeneity*** is an index of how heterogeneous the community's people were in terms of racial composition by subtracting the sum of the squared proportions of each racial group in the community from one. The racial heterogeneity index was calculated for each of the two time points. *Racial heterogeneity at time-1* was included to

estimate the baseline probability of gang participation attributable to the effect of racial heterogeneity. The residual change score for racial heterogeneity was calculated as an indicator of rapid change in this community structural characteristic.

**Youth composition** was calculated as the percentage of the population between 14 through 24 years of age in 1990 and again in 2000. *Youth composition at time-1* was included to estimate the baseline probability of gang participation attributable to the effect of youth composition. The residual change score for youth composition was calculated as an indicator of rapid change in this community structural characteristic.

School predictors were modeled as exogenous variables.

**School Social Bonds (SSB)** is a latent variable that characterizes the extent to which the school as a whole adheres to prosocial beliefs and norms. It is measured by the school-level components of student reports. In clustered samples, the data collected at the individual level may be conceptualized as having at least three sources of variance: variance due to (a) the individual respondent, (b) the cluster to which the individual belongs, and (c) random error. The proportion of variance in individuals' scores that is due to his or her cluster should be the same across these same-cluster subjects. This group-level variance component of the score is modeled in the between model. The three indicators of SSB are the school-level variance components in the observed scores of the student responses to *belief in conventional rules* ( $\rho = .13, \lambda = .88$ ), *commitment to education* ( $\rho = .03, \lambda = .61$ ), and *attachment to school* ( $\rho = .04, \lambda = .66$ ).

**School Disorder** is a latent variable that characterizes the extent to which the school environment is threatening. It is measured by three school variables. The school's

ability to generate a sense of safety is reflected in the between-components<sup>5</sup> of the perceptions among its students and teachers, as well as in the level of orderliness within its classrooms. First is the school-level components in the observed scores of student responses to 9 items about feeling fearful at school (described in the individual characteristics section previously;  $\rho = .06, \lambda = .74$ ). The second score is the school mean *teacher reported sense of safety* using 8 items adapted from the ESB (in this sample,  $\alpha = .94, \rho = .13, \lambda = .79$ ). The scale includes items about the safety of classrooms and other places in the school. The third indicator is the school mean teacher reported level of *classroom order* using 14 items adapted from the ESB ( $\alpha = .92, \rho = .16, \lambda = .83$ ). Its items assess whether or not students pay attention in class, that students do not damage or destroy property, and that little disruptive classroom behavior occurs. These scales were scored such that higher values indicate higher levels of School Disorder.

*School Fair and Clear Rules* ( $\rho = .08, \lambda = .79$ ) is a latent variable measured by the school-level components of the three parcel scores derived from the previously described 7-item Fair and Clear Rules student scale adapted from the ESB (G. Gottfredson, 1999).

### **Data Analysis**

Since the current study uses data obtained from clustered sampling procedures, a common source of variance in individuals' scores from the same school is attributable to the cluster/school from which they derive. This contextual effect would theoretically affect all students in the same school equally. At the same time, individual students' scores differ because of their idiosyncratic experiences. Thus, student scores can be

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<sup>5</sup> The between-components in the observed scores explain the variance among school scores due to between-school variation. The within-components in the observed scores explain the variance among individual student scores due to each person's unique variation.

conceptualized as resulting from student characteristics *and* school characteristics, plus random error. These two sources of variance are independent. As Preacher, Zyphur, and Zhang (2010) explained, students of the same school are assumed to receive the same “dosage” of the treatment exerted by the school. Although the presence or absence of a certain school characteristic plays a role in student outcome, this effect is constant for all students of the same school, making it a between-group effect.

Mplus Base Program with Multilevel Add-on software (Muthén & Muthén, 2012) was used to analyze the model in a hierarchical latent variable structural modeling (HLVSM) framework with two levels. HLVSM was used because it allowed for the estimation of variance due to errors in observed measures so that appropriate corrections in the structural coefficients were calculated when assessing the relations among the latent variables. Put another way, HLVSM allows for the estimation of the relationships with *unobserved factors* which are *not* directly measured. Measurement models (Figure 2 & Figure 3) were specified for both the individual and the school/community latent variables. Confirmatory factor analyses were conducted prior to assessing the structural model to examine the measurement portions of the models. Mplus automatically imputes missing data in its analyses with a multiple imputation method using Bayesian estimation.

Using the *ANALYSIS TYPE=TWOLEVEL* function, Mplus decomposes the observed variables into within- and between-level components which can then be modeled in their respective levels. This procedure allows for proper estimation of the parameters because as explained above, “if a variable has both Between and Within variance components, the Between component is necessarily uncorrelated with the Within component of the variable and the Within components of all other variables in the

model,” and vice versa (Preacher, Zyphur, & Zhang, 2010, p. 210). It also accommodates multilevel models with random level-1 intercepts (i.e., intercept-as-outcome) to be predicted by level-2 variables. The weighted least squares means and variances (WLSMV) estimator was used. The WLSMV estimator uses “a diagonal weight matrix with standard errors and mean- and variance-adjusted chi-square test statistic that use a full weight matrix” (Muthén & Muthén, 2012, p. 603). Regression coefficients obtained from weighted least squares estimators such as WLSMV are probit regression coefficients.

At the *within* level (or level-1), students’ individual characteristics are represented; the *between* level (or level-2) includes school and community predictors. The dependent variable is the student-level probability of self-reported gang involvement. The theoretical model is displayed in Figure 1.

**Confirmatory factor analyses** allowed an assessment of the degree of correlations among the latent variables and an examination of the statistical significance of the path coefficients in the measurement model. At the student-level (see Figure 2), the latent factor Social Bonds is indicated by the scale scores of *belief in conventional rules*, *commitment to education*, and *attachment to school*. The Fair and Clear Rules, Fear, and Victimization factors are each measured by three parcels composed of items from their respective scales. One of the loading parameters of each factor was fixed to one.

At the school and community level, three factors were hypothesized from the teacher (*teacher safety* and *classroom order*) and student (*belief in conventional rules*, *commitment to education*, *attachment to school*, *fair and clear rules*, and *student fear*) questionnaires (see Figure 3). The first factor was hypothesized to be School Social Bonds, which included the between components of the student-reported *belief in*

*conventional rules, commitment to education, and attachment to school* composites.

School Disorder was the second hypothesized factor consisting of the between components of the reverse-scored *classroom order* and *teacher safety* scales, as well as the between components of the three parcels of *student fear* items. Finally, the School Fair and Clear Rules factor was measured by the between-level latent components of the three parcels of *fair and clear rules* items. One of the loading parameters of each factor was fixed to one.

**Model specification.** First, an empirical procedure was undertaken to identify only paths with significant contributions. The models were first analyzed in a stepwise fashion in which predictors were added in succession to predict the probability of gang involvement. Predictors that did not make significant contributions were excluded from future steps such that the final model (i.e., the empirically-derived model) included only significant predictors. Regression models for the latent predictors were identified and these endogenous predictors plus the measured covariates were then entered into the within portion of the model. Next, significant, direct effects<sup>6</sup> of the individual characteristics (i.e., without the school predictors) on the probability of gang involvement were estimated. I also tested for the mediation paths hypothesized. This procedure was repeated for the between portion of the model (without the individual-level variables). Finally, significant paths at both levels were entered in the model simultaneously to examine if the level-1 variables attenuate the apparent effects of school-level variables. In short, the model was first analyzed for empirically significant paths at level-1 (student level), and then the level-2 model without level-1 effects was empirically derived. Lastly,

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<sup>6</sup> The term “effect” is used for convenience to avoid stilted language. It is not meant to imply that the model is correctly specified, justifying causal interpretations.

both level-1 and level-2 models were combined to determine the empirically-derived model. Next, the regression coefficients for the fully-recursive model were estimated. Finally, the equations were specified according to the hypothesized model.

The equation at the student level is:

$$\Pr(y_{ij}^* > 0 | X_{hij}, \eta_{gij}) = \Phi(v_{0j} + \sum_{h=1}^3 \beta_{hj} X_{hij} + \sum_{g=1}^4 \lambda_{gj} \eta_{gij} + e_{ij}) , \quad (1)$$

where  $y_{ij}^*$  is the latent probability that student  $i$  in school  $j$  is involved in a gang given the covariates. The likelihood that gang involvement is observed (e.g.,  $y_{ij} = 1$ ) is the cumulative area under the normal distribution corresponding to the  $z$ -score  $y_{ij}^*$ .  $\Phi$  is the cumulative normal probability function.  $v_{0j}$  is a random intercept representing the covariate-adjusted proportion of White or Asian female students at school  $j$  who are gang involved,  $\beta_{hj}$  are the coefficients for the  $X_{hij}$  (the measured student-level predictors—sex, age, and race/ethnicity), and  $\lambda_{gj}$  are the coefficients for the  $\eta_{gij}$  (the latent student-level predictors—Fair and Clear Rules, Social Bonds, Victimization, and Fear).

Next, the intercept of the student-level model was treated as a continuous latent outcome variable and regressed on school and community characteristics. In other words, the group mean varied according to school and community characteristics. The school and community level (i.e., without including the student predictors) equation follows.

$$v_{0j} = \alpha_{00} + \sum_{q=1}^6 \gamma_q W_{qj} + \sum_{p=1}^3 L_p h_{pj} + u_j , \quad (2)$$

where  $\alpha_{00}$  is the grand percentage of students who reported gang membership (i.e., across all schools  $j$ ), the  $\gamma_q$  are the coefficients of the  $W_{qj}$  (i.e., the measured community predictors—community change and community risk at time 1), and the  $L_p$  are the

coefficients of the  $h_{pj}$  (i.e., the latent school predictors—School Fair and Clear Rules, School Social Bonds, and School Disorder). Residual school-specific variance is indicated by the  $u_j$  error term.

Finally, the model was re-specified by modeling the within and between models simultaneously. Thus, equation 1 may be re-written to represent student  $ij$ 's predicted probability of gang involvement as a combination of the individual- and school/community-level deviations from the grand mean:

$$\Pr(y_{ij}^* > 0 | X_{hij}, \eta_{hij}) = \Phi(\alpha_{00} + \sum_{q=1}^6 \gamma_q W_{qj} + \sum_{p=1}^3 L_p h_{pj} + \sum_{h=1}^3 \beta_{hj} X_{hij} + \sum_{g=1}^4 \lambda_{gj} \eta_{gij} + e_{ij} + u_j) . \quad (3)$$

Model fit was examined using multiple fit indices to obtain converging evidence of acceptable model fit. First, the standardized root mean squared residual (SRMR) evaluates the overall discrepancy between the observed and model-implied covariances, and improves as more parameters are included in the model. Second, the root mean square error of approximation (RMSEA) fit index adjusts for model complexity and improves as more parameters with useful contributions are included in the model. Third, the comparative fit index (CFI) evaluates a model's fit relative to the null model (i.e., no relationships among variables). Of course, the more parameters, the better the fit. The criteria that SRMR is less than or equal to .09, the RMSEA is less than or equal to .06, and the CFI is greater than or equal to .95 (Hu & Bentler, 1999) were used.

## Results

Results from the confirmatory factor analyses for the within and between models are displayed in Figure 2 and Figure 3, respectively.

At the student-level, all latent variables were significantly correlated with one another at  $p = .05$ . The highest correlation was between Fair and Clear Rules (FCR) and

Social Bonds ( $r = .75$ ). Personal Victimization was negatively correlated with FCR and Social Bonds ( $r = -.36$  and  $-.34$ , respectively), but positively correlated with Fear ( $r = .32$ ). Fear was also negatively correlated with FCR and Social Bonds, though the correlations were weak ( $r = -.08$  and  $-.06$ , respectively).

For school characteristics, schools with higher School Fair and Clear Rules (SFCR) tended to have higher levels of School Social Bonds ( $r = .84$ ). Schools lower on SFCR had higher School Disorder ( $r = -.32$ ). School Social Bonds and School Disorder were not significantly correlated at  $p = .05$ .

### **Zero-order Relationships between Gang Involvement and Predictors**

Table 2 displays the zero-order coefficients for the regression of the probability of gang involvement on each predictor variable separately. The regression coefficient is an estimate of the bivariate relationship between each predictor and the probability of gang involvement.

All of the student-level variables explained significant variance in the probability of gang involvement at  $p \leq .05$ . Of the latent variables, Social Bonds had the highest correlation with gang involvement (standardized regression coefficient =  $-.573$ ,  $SE = .014$ ), followed by Fair and Clear Rules which decreased the probability of gang involvement (standardized coefficient =  $-.437$ ,  $SE = .014$ ), Personal Victimization (standardized coefficient =  $.381$ ,  $SE = .012$ ), and Fear (standardized coefficient =  $.175$ ,  $SE = .013$ ). In other words, going one standard deviation above the mean in Social Bonds or in Fair and Clear Rules decreased the probability of gang involvement from 6% to 2%. Next, moving one standard deviation above the mean on Personal Victimization increased the probability of gang involvement to 11%. Moving one standard deviation

above the mean score on Fear increased the probability of gang involvement to 8%. In terms of the student demographic variables, minority status ( $Y$ -standardized coefficient = .458,  $SE = .029$ ) had the highest zero-order correlation with the probability of gang involvement, followed by being male ( $Y$ -standardized regression coefficient = .300,  $SE = .072$ ), and finally, age (standardized regression coefficient = .057,  $SE = .017$ ). The probability of gang involvement for a student who is not White or Asian was estimated to be about 10% (compared to 4% for the White or Asian students). Male students' probability of gang involvement was about 8% (compared to 4% for girls). Going one year above the mean age in the sample, the probability of gang involvement is about 6%. As expected, minority status, being male, age, Personal Victimization, and Fear were positively correlated with gang involvement; whereas Social Bonds and Fair and Clear Rules were negatively correlated with gang involvement.

At the school and community level, School Social Bonds and School Fair and Clear Rules were strongly and negatively correlated with the probability of gang involvement (standardized regression coefficients = -.751 and -.599;  $SE = .076$  and .069, respectively). Moving one standard deviation above the mean on either SSB or SFCR decreased the probability of gang involvement from 6% to 1%. School Disorder was positively related to the probability of gang involvement such that a one standard deviation increase in School Disorder increased the probability of gang involvement to 13% from 6% (standardized coefficient = .486,  $SE = .075$ ). Concentrated Disadvantage and Racial Heterogeneity in the community were weak correlates of gang involvement (standardized coefficients = .327 and .229; both  $SE = .081$ , respectively). Moving from the average community to a community that is one standard deviation higher on CD

increased the probability of gang involvement from 6% to 10%; moving to one that is one standard deviation higher on RH increased gang involvement probability to 9%. Youth composition at baseline and the three community change variables were not correlated significantly to gang involvement.

Based on (a) the high correlations between Fair and Clear Rules and Social Bonds at both levels of the model, (b) subsequent analyses that suggested multicollinearity problems with the inclusion of both latent variables, (c) empirical support that Social Bonds contributed more variance in the probability of gang involvement than did Fair and Clear Rules, and (d) theoretical interest, I decided to exclude Fair and Clear Rules from this research.<sup>7</sup>

### **Student-Level (Within) Model**

Before building the student-level model in the two-level modeling of gang involvement, each student-level predictor variable was regressed on relevant covariates in separate analyses to obtain the equations for these endogenous variables to be used in subsequent steps. This process allows potential multicollinearity among the covariates to be examined, and to include only statistically significant covariates in the final model for parsimony. The progression and results are displayed in Table 3. All variables that were temporally earlier in the causal chain were included as covariates for the variables later in the chain. For all of the student variables, each covariate entered in the regression model explained significant, additional variance in the dependent variable. The far-right column in Table 3 shows the final models for the endogenous variables using this empirical procedure.

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<sup>7</sup> Analyses were also run with the Fair and Clear Rules latent variable, with little differences in the interpretation of the results. Refer to the appendix for these tables.

The probability of gang involvement was then regressed on the measured demographic covariates and endogenous latent variables in a stepwise procedure to predict the probability of gang involvement, as shown in Table 4. In steps one through three, the probability of gang involvement was regressed on student gender, minority status, and age. The demographic variables' contributions remained significant in each step. Being male, being an ethnic minority member, and being older were each found to predict a higher probability of gang involvement beyond the contributions of the other demographic variables.

In step four, Personal Victimization was added to the model and found to have additional, significant positive contribution to the probability of gang involvement. Also, the effect of being male on the probability of gang involvement reduced to non-significance with the addition of Personal Victimization in the model.

Social Bonds was next added to the model (step five) and found to be a significant, negative predictor of gang involvement after accounting for the variables already in the model. When Social Bonds was added to the model, the relationship between student age and gang involvement reversed directionality. Specifically, older students were predicted to be less likely gang-involved after taking into account Social Bonds (and other variables already in the model).

In step six, Fear was also included in the model. After accounting for the contributions of the previous variables, Fear was found to be a significant, positive predictor of gang involvement. The regression of the probability of gang involvement on Fear did not mediate the relationship between Personal Victimization and the Gang

Involvement as hypothesized. In other words, this latter relationship remained significant at  $p < .05$ .

Since the introduction of Personal Victimization, being male remained a non-significant predictor of gang involvement in subsequent steps, so it was excluded from later analyses using this empirical procedure (note that “Male” was included as a predictor in the fully-recursive and theoretical models). The final empirical model for predicting gang involvement at the student-level included minority status, age, Personal Victimization, Social Bonds, and Fear.

### **Community and School-Level (Between) Model**

The steps taken to build the within model were followed to build the school- and community-level model, or the between model. First, each group-level predictor variable was regressed on covariates in separate analyses to obtain these endogenous variables' equations to be used in subsequent steps. The progression and results are displayed in Table 5.

No covariate contributed significant variance in School Social Bonds (SSB) after accounting for other variables already in the model; SSB was specified as an exogenous predictor variable in subsequent steps.

For School Disorder, baseline community concentrated disadvantage, baseline community racial heterogeneity, change in community concentrated disadvantage, and change in community racial heterogeneity were all found to be positive correlates.

Next, the probability of gang involvement was regressed on community and school predictors in a stepwise procedure (see Table 6). In steps one through three, the baseline community risk variables were entered. Baseline community disadvantage was

found to be the only variable that predicted variance in gang involvement. The community change variables were added in steps four through six. None of the community change variables were found to be significant predictors of gang involvement. In step seven, School Social Bonds (SSB) was added to the model and it was found to be a significant, negative predictor of gang involvement, net of the other variables already in the model. In step eight, School Disorder was added and found to be a significant, positive predictor for gang involvement after accounting for the previous variables. The inclusion of School Disorder mediated the relationship between baseline community concentrated disadvantage and gang involvement. Concentrated disadvantage was excluded from the final empirical between model in subsequent analyses. The fit indices for the between model did not suggest good fit. This is not surprising since the fit indices were not developed for assessing multi-level models which have no predictors at the within level.

### **Combined Model**

The final within and between models described in the preceding paragraphs were combined in the final empirical model. Results are displayed in Table 7. When the within and between equations were simultaneously modeled (i.e., the combined two-level model), all regression coefficients remained significant at  $p = .05$ . Of note, virtually no change (with one exception) was observed in the coefficients when the models were combined. The combined model has acceptable fit (RMSEA = .02; SRMR = .02 and .20 for the within and between models, respectively; CFI = .98).

Student characteristics that were significant in predicting the probability of gang involvement, net of the other student and community/school covariates in the model,

included Personal Victimization, Social Bonds, Fear, minority status, and age. The effect sizes of the regression coefficients of the student predictors in the combined model were similar to those in the within-level model. Being of non-White, non-Asian racial membership continued to predict a higher probability of gang involvement, whereas increased age continued to predict a slightly lower probability of gang involvement, net of the other variables in the model. Of the continuous variables, the covariate-adjusted Social Bonds effect on the probability of gang involvement was the largest, followed by Personal Victimization, and finally, Fear. In other words, a female, non-minority student who scored at the mean of the other variables has a 9% probability of being gang-involved if her Social Bonds were one standard deviation below the mean, compared to 3% if she scored at the mean on the Social Bonds factor. For the same student, now controlling for Social Bonds, her probability of gang involvement is 5% compared to 3% if she scored one standard deviation above the mean Victimization score versus if she scored at the mean. These relationships were in the hypothesized directions.

At the group-level, School Social Bonds and School Disorder continued to explain significant variance in gang involvement, net of all of the other variables already in the combined model. Whereas the effect estimate for the SSB coefficient remained similar in size, there appeared to be a partial mediation of the relationship between School Disorder and the likelihood of gang involvement after the inclusion of the student variables. The regression coefficient for School Disorder in the combined model, while still statistically significant at  $p \leq .05$  in explaining the probability of gang involvement, was found to be significantly lower than its size in the between model. A female, non-minority student who scored at the mean of the other variables has a 14% probability of

being gang-involved if she attended a school that scored one standard deviation below the mean on SSB, compared to 3% if she attended a school that had the mean score on SSB. Controlling for SSB, the same student who attends a school that scores a standard deviation above the mean on School Disorder has a 6% probability of gang involvement, compared to 3% if she were to attend a school that scores at the mean on School Disorder. Nonetheless, these school effects on gang-involvement were in the hypothesized direction.

### **Model Comparisons**

The results of the fully recursive, theoretical, and empirical regression models of the probability of gang involvement are displayed in Table 8. The fully-recursive model includes all paths from variables temporally earlier in the path diagram to variables later in the causal order. The theoretical model includes only hypothesized paths. The fit indices suggest that the empirical model has the best fit relative to the other two models, followed by the fully-recursive model, and finally, the theoretical model. In general, the three models' fit are similar in that all indicate acceptable fit.

### **Discussion**

The current research suggests that gang prevention efforts may consider policies that involve schools as institutions of social control. Certain community demographic changes were found to affect school characteristics, which in turn affected student gang involvement. The U.S. is undergoing rapid demographic transformation due to immigration and subpopulation differences in fertility rates—as well as to internal migration. The effect of changing community demography on schools and youth gang participation has not received sufficient attention. Better schools are associated with

better communities. By creating safe and controlled school environments, the communities in which the schools reside may benefit as well.

Extending the social bonds theory, I hypothesized a school-level construct that restrains students from gang-involvement. Using social disorganization theory, I hypothesized that rapid community demography change negatively affects School Social Bonds (schools' ability to restrain its students against delinquency) and increases School Disorder (a threatening school environment), thereby increasing youth gang participation. Partial support for these hypotheses was found. I also hypothesized that these school effects on gang involvement would be attenuated after accounting for individual student characteristics. These hypotheses were not supported by the findings.

### **Student Characteristics and Gang Participation**

The results support my first hypothesis that students with higher levels of fear and victimization have higher likelihoods of joining gangs, after accounting for student sex, age, ethnicity, and social bonds.

My second hypothesis that student fear would act as a mediator for the relationship between victimization and gang participation, after accounting for student sex, age, ethnicity, and social bonds, was not supported by the data. The lack of support is not surprising considering the mixed evidence regarding the role of fear and gang participation in the literature. On the one hand, fear may lead to joining a gang; on the other hand, if a student who joins a gang experiences more victimization, then fear may result from gang participation (and increased victimization). The relationship between being male and gang involvement, however, was found to be completely mediated by Personal Victimization.

Fearful students and victimized students are both more likely to be gang-involved than their counterparts, and victimized students are more fearful than non-victimized students. The potential mediation of the relationship between gender and gang-involvement by victimization suggests that a female student who has experienced the same level of victimization as her male counterpart is as likely to join a gang as the male peer. These findings suggest that school environments that have lower rates of student victimization are less likely to have student gang involvement. In a typical school day, adult supervision of students may be at a minimum during class transition times relative to the rest of the school day. At these times when many students occupy a limited amount of space, physical boundaries may be invaded and social conflicts may trigger events that result in student victimization. Increased monitoring of students during such times allows staff and faculty to intervene between students when necessary to reduce victimization. Reducing victimization events may be a stepping stone toward the broader goal of reducing youth gang involvement by promoting a school context that restrains students from delinquency. Plus, from a program evaluation perspective, victimization as a variable can be used in the process of goal-setting in gang-prevention programs because it can be easily recorded as counts.

Victimization was also found to be significantly correlated with Social Bonds. Students characterized by high levels of social bonding were less likely to be gang-involved. School officials may structure school curriculum in such a way that promotes social bonds in students. For example, in a randomized study (D. Gottfredson & Gottfredson, 1992), students who participated in Project STATUS (Student Training Through Urban Strategies) reported lower delinquency, greater academic success, lower

alienation, and higher attachment to school. Project STATUS is a program for high-risk secondary school students that uses a combined English and social studies class with a coordinated law-related education curriculum. Two-hour lessons spanned the school year and were divided into five units on the different institutions in American society focusing on the functions of their rules and codes of conduct. This intervention emphasized student participation and cooperative learning through structured peer contacts that focused on prosocial activities (D. Gottfredson & Gottfredson, 1992).

Alternatively, as suggested by the high correlation between social bonding and student perceived school rules as fair and clear, a strong anti-violence message coupled with fair and clear disciplinary actions for behavioral infractions may help reduce student victimization. Although it is difficult to establish whether gang involvement occurs before victimization or vice versa, these steps to reduce victimization and increase social bonds are worth taking to examine their effectiveness in restraining students from joining a gang.

### **Community Structure and Gang Participation**

Community structural characteristics of Concentrated Disadvantage, Racial Heterogeneity, and Youth Composition seemed not to be direct causes of gang involvement. Whereas CD and RH may be at least indirectly related to the probability that a student becomes involved in a gang, YC in the community had no apparent effect, either direct or indirect, on gang involvement. That is, gang involvement seemed not be a result of just having a group of individuals who belong to the age group most likely to be in youth gangs. Steffensmeier and Harer's (1999) study of U.S. crime trends found fluctuations in general crime indices after adjusting for changes in the population's age

composition, and proposed that other variables (e.g., reporting method, community changes) may affect crime rates. Indeed, CD and RH in the community were shown here to be related to the school's social disorder, which in turn influenced its students' likelihood of gang involvement.

### **Community Change and Schools**

My third hypothesis was that rapid change in community demography (concentrated disadvantage, youth composition, and racial heterogeneity) would be associated with increased levels of School Disorder, after accounting for the effects of these community characteristics at baseline. This hypothesis was only partially supported. Changes in the community's levels of concentrated disadvantage and racial heterogeneity, but not in its youth composition, were related to the school's level of disorder.

I also hypothesized that rapid changes in community demography would be associated with lower levels of School Social Bonds (SSB), after accounting for the effects of these community characteristics at time 1. This hypothesis was not supported: None of the community change variables (concentrated disadvantage, youth composition, racial heterogeneity) was significantly related to the level of SSB after accounting for baseline community measures. Although many aspects of a school and its community are interdependent, it appears that SSB is not related to the level of concentrated disadvantage, youth composition, or racial heterogeneity in its community. One explanation for this finding may be that this study did not capture important community structural characteristics that influence SSB. Another reason for the lack of correlations is that SSB and community characteristics may be less related than expected. Kirk (2009) found that positive school social effects may compensate for community risk factors in

delinquent outcomes. Regardless of the risk factors present in a community, its youth can still make prosocial ties in schools (or at home, for that matter). Teacher training should emphasize the importance of positive student-teacher relationships and how to show care for their students to foster social bonds. Upon reflection, this lack of relationship between community structural characteristics and SSB is not surprising according to social bonds theory. Hirschi (2004) described social bonds as a set of inhibitions against CABs, and these inhibitions are regulated by important others' approval of CABs. M. Gottfredson and Hirschi (1990) argued that children develop social bonds from a young age via rearing practices. They did not suggest that community structure had a direct effect on one's social bonds.

SSB was not found to be correlated with School Disorder, but it did have a positive and strong relationship with School Fair and Clear Rules. Schools which communicate rules that are both fair and clear appear also to be better able to restrain its students from gang involvement.

### **Person, Environment, and Gang Involvement**

My remaining hypotheses concern the relationships among students, their schools and communities, and gang participation. Specifically, I hypothesized that School Disorder would increase gang involvement, whereas School Social Bonds would decrease gang involvement, after accounting for other school and community characteristics. I also expected that these relationships would attenuate after considering student characteristics.

The first parts of these hypotheses were supported by the results. Accounting for the other school and community variables in the model, School Disorder was found to

predict a higher probability of gang involvement whereas School Social Bonds was a negative predictor of gang involvement. These findings provide support for social disorganization theory and social bonds theory, respectively. According to social disorganization theory, disadvantaged communities are ill-equipped to foster common values among residents, thus preventing the communities to be socially organized and they lose control of its youths. Youths in these communities are less restrained to commit crimes and other delinquent acts. The current findings suggest that social disorganization in the school also has a negative relationship with youth delinquency. SSB had the largest relationship with student gang involvement than the other variables in the models that remained strong even after the inclusion of its individual-level counterpart. This finding supports the extension of the social bonds theory to the group level. Namely, SSB is a distinct contextual effect on gang involvement (as opposed to a compositional effect).

The latter parts of the hypotheses that the relationship between School Disorder and gang involvement as well as that between SSB and gang involvement would be attenuated after taking student characteristics into consideration, however, were not fully supported. The relationship between SSB and gang involvement remained strong and similar in magnitude when the between model was combined with the within model. Although it remained statistically significant, the relationship between School Disorder and gang involvement was partially mediated by the inclusion of the student characteristics. These results provide support both for line of research on the intervening variables of social disorganization between community structural characteristics and delinquent outcomes. For example, community structure (change) affects social organization (School Disorder), which affects delinquency (gang involvement).

Another finding based on these analyses suggested mediation of the relationship between concentrated disadvantage in the community and gang involvement by School Disorder. Concentrated disadvantage in the community at baseline was found to be a significant predictor for both gang involvement and School Disorder. In modeling the probability of gang involvement, concentrated disadvantage continued to contribute significant variance after accounting for School Social Bonds. When School Disorder was additionally taken into consideration, however, concentrated disadvantage in the community at baseline was no longer a significant predictor of gang involvement. Concentrated disadvantage in the community may have an indirect effect on gang involvement by contributing to a threatening school environment that increases students' likelihood to join a gang.

### **Implications**

Received opinion among gang researchers at present is that the risk factors for gang participation are the same as risk factors for serious delinquency (M. Gottfredson & Hirschi, 1990), although gang participants generally show more of these risk factors or show them in more extreme degree (Esbensen et al., 2009; Gordon et al., 2004). Research by G. Gottfredson and Gottfredson (2001) and G. Gottfredson (2006) suggests that fear in schools and in communities are risk factors for gang participation. The present research searched for additional risk factors arising from community ethnic group and socioeconomic composition of social areas—and changes in those characteristics. I found that the protective effect of School Social Bonds against youth gang involvement and the risk factor of School Disorder for gang involvement are significant even after individual student characteristics have been taken into consideration.

Despite the importance of gang problems for crime, victimization, and school safety, we have little specific knowledge of how to intervene or where and when gang problems are likely to emerge. At present, empirical research on program effectiveness and what is actually implemented in the schools to prevent student involvement in gangs do not match. Although evidence in the literature suggests that recreation, enrichment, or leisure activities have little effect in gang prevention, schools continue to promote such programs. Specifically, this type of school-based prevention activity makes up 8% of all gang prevention programs in the schools, or about a count of over 62,500 of these programs (G. Gottfredson & Gottfredson, 2001). Similarly, little evidence supports the use of counseling intervention in alleviating gang and problem behaviors, but this category of gang intervention activity makes up more than 20% of all gang intervention programs in U.S. public schools, which translates into more than 127,800 of these programs (G. Gottfredson & Gottfredson, 2001).

A recent evaluation of the Gang Resistance Education and Training (G.R.E.A.T.) program (Esbensen, Peterson, Taylor, & Osgood, 2012) found that the students who participated in the G.R.E.A.T. intervention had lower odds of gang membership than those who were in the comparison group. G.R.E.A.T. is a 13-lesson school-based program that is taught by uniformed officers trained in classroom management and incorporates information from educators and prevention specialists (Esbensen et al., 2012). G.R.E.A.T. aims to reduce gang membership, delinquency and violent offending, and improve attitudes toward law enforcement by emphasizing skill development through cooperative learning strategies and problem-solving exercises. Except for this recently published study, however, several empirical studies have shown little to no effects of

school-based gang prevention and intervention programs (G. Gottfredson & Gottfredson, 1997). The current research contributes knowledge that may be helpful in identifying schools where problems are likely to emerge and intervention ideas.

Schools may be in a position to prevent youth gang involvement. School Social Bonds, a construct that has a strong relationship with gang involvement, was not significantly related to the community characteristics measured. Thus, policymakers may consider emphasizing gang-prevention efforts within school buildings rather than in the community at-large. Community concentrated disadvantage was found to predict youth gang participation via the school's level of disorder. A primary target for gang prevention efforts should be in schools that reside in less affluent communities. Furthermore, a high correlation between school environments that communicate fair and clear rules and schools' ability to restrain students against delinquency may have implications for anti-gang programming in schools. School officials interested in countering a climate conducive to gang-involvement may foster an environment where rules are both fair and clear to promote School Social Bonds. Instead of zero-tolerance policies that promote unfair dispositions for certain disciplinary infractions, it may be more effective to have punishments that are swift and certain in response to the offense. Although we cannot control parenting practices, school principals *can* control what they do. Especially in communities with high levels of concentrated disadvantage, school administrators can create safe and fair climates to promote quality learning environments where education is valued to provide an environment that is different from one associated with youth gang problems.

Currently, policymakers are inclined toward coercive methods as the basis of their battle against youth gangs. Laws and ordinances that “make it easier to harass and punish presumed members of juvenile gangs” (Geis, 2002, p. 259) have made their ways into police practices nationally. I argued that psychological processes of fear and social bonding and sociological processes of school social bonding and school disorder are primary forces that regulate youth engagement in delinquency. My research suggests that we should focus on creating just, safe, and orderly school environments in our efforts to combat youth gangs. Cook, Gottfredson, and Na (2010) reviewed research on school crime control and prevention. They found support for classes that have lower student-to-teacher ratio, that are taught by a small number of different teachers, and that experience fewer class changes as organizational approaches that may help to increase students’ connectedness to others, thereby restraining them from delinquency. In addition, Cook et al. indicated that schools experienced less disorder when school rules were clear, fair, and consistent. Less disorder was also observed in schools where students helped establish procedures to address behavioral issues (Cook et al., 2010). Cook et al. reported that interventions that communicated norms and behavioral expectations for students showed promise in reducing student problem behaviors. Strategies that draw their strengths from providing a sense of safety and sources of prosocial connectedness within schools are preventative and early intervention strategies that can benefit our society without infringing upon youths’ emerging need for independence.

### **Limitations**

A primary limitation in this research is that the sampled students included only those who attended school on the day the surveys were given, thereby excluding by

design truants, absentees, and dropouts. This limitation can be a major threat to the validity of the conclusions made about the variables that lead to youth gang involvement because those students who belong to a gang may be among those who are most likely to be absent from school. Thus, according to theory, those students who would self-report lower levels of social bonds and/or higher victimization would not have been sampled, skewing these scale scores more positively than if they were included in the sample. This might result in an underestimate of the relationships between the predictors and the outcome of gang involvement. On the other hand, my hypotheses may only apply to those who are in school.

Another limitation is the selection of public schools and the exclusion of private and Catholic schools. Thus, generalizability of the results to non-public schools is unknown. According to the Bureau of Justice Statistics, however, the prevalence of gang members in private schools is much lower than in public schools for all years reported between 2001 and 2009. In the present data the prevalence of gang members in private and Catholic schools was very low at less than three percent. In other words, the need to generalize results to these settings may be low.

The cross-sectional method of collecting data on gang participation and school-based variables reduces the ability of the study to establish causality between these variables due to ambiguous temporal ordering. This limitation, however, does not apply to the community structural variables.

Finally, to the extent that the model is not correctly specified (i.e., fails to include all of the variables that should be included), the findings are to that degree less valid. According to social bonds theory (M. Gottfredson & Hirschi, 1990), predictors of CABs

at the individual level include parenting practices (parental monitoring of the child's behaviors, parental recognition of deviant behaviors displayed by the child, punishment of deviance to decrease its frequency) and self-control measures such as impulsiveness. These variables were not available in this dataset.

### **Virtues**

My research adds to the existing literature by extending the social bonds theory to the group level. Using M. Gottfredson and Hirschi's (1990) framework, I evaluated if the context of social bonds as restraints against delinquency may be extended to aggregates. The school is a natural group-level unit in which to test this theory because most youths attend schools. Plus, school-relevant findings are practical since policymakers can more likely affect school administration as opposed to parenting practices, which were theorized as precursors of social bonds in children. My research provides support that schools can provide a climate characterized by prosocial bonds and ties to manage youth delinquency.

My research also extends the literature by examining the role of community demographic change in youth gang problems. This kind of research is timely as our society experiences changes in our communities from internal migration and immigration, as well as from changes in age group compositions.

### **Future Directions**

Future research on this topic of community change, school climate, and delinquency may consider a longitudinal design that would increase the defensibility of causal interpretations. Future studies may also consider including measures of parental discipline and self-control at the individual level. A sizable number of youth gangs

consist of individuals of Asian descent. The separation of Asian ethnic subgroups may shed light on important intra-racial differences in gang participation. At the group level, the inclusion of family composition in the community as a potential predictor of youth delinquency may also be worth exploring.

The sample of Catholic and private schools in this dataset was small, with only 33 students who reported gang membership in these schools. Although the percentage of gang-involved students was lower in non-public schools than in public schools, future research may investigate the characteristics of youths in those settings who *did* self-report gang membership. Since gang involvement is such a rare observation in these schools, it might be of interest to understand what these students are like. Future research is needed to investigate if students in these schools are more extreme cases whose probability of gang membership may still be accurately predicted in a model based on social organization and bonds theory.

Table 1  
*Student Characteristics*

Demographic			
characteristic		<i>N</i>	%
Sex	Male	7042	47.9
	Female	7397	50.3
	Missing	265	1.8
Race	White	9902	67.3
	Black	1954	13.3
	Asian	430	2.9
	American Indian	284	1.9
	Other	1798	12.2
	Missing	336	2.3
Hispanic	Yes	2024	13.8
	No	12282	83.5
	Missing	398	2.7
Age	≤ 9	44	.3
	10	37	.3
	11	606	4.1
	12	2306	15.7
	13	3254	22.1
	14	2760	18.8
	15	1793	12.2
	16	1465	10.0
	17	1315	8.9
	≥ 18	850	5.8
	Missing	274	1.9
Total		14704	100.0

Table 2

*Standardized Zero-order Regression of the Probability of Gang Involvement on Individual- and Group-level Predictors*

Predictor	Intercept	<i>B (SE)</i>
Student-level		
<b>Male<sub>ij</sub></b>	<b>1.736 (.030)</b>	<b>.300 (.072)</b>
<b>Minority<sub>ij</sub></b>	<b>1.729 (.027)</b>	<b>.458 (.029)</b>
<b>Age<sub>ij</sub></b>	<b>1.586 (.027)</b>	<b>.057 (.017)</b>
<b>Social Bonds<sub>ij</sub></b>	<b>1.595 (.027)</b>	<b>-.573 (.014)</b>
<b>Fear<sub>ij</sub></b>	<b>1.595 (.027)</b>	<b>.175 (.013)</b>
<b>Personal Victimization<sub>ij</sub></b>	<b>1.595 (.027)</b>	<b>.381 (.012)</b>
Community- & School-level		
<b>Concentrated Disadvantage at Time 1</b>	<b>1.598 (.027)</b>	<b>.327 (.081)</b>
<b>Racial Heterogeneity</b>	<b>1.593 (.028)</b>	<b>.229 (.081)</b>
Youth Composition	1.598 (.028)	.075 (.102)
Concentrated Disadvantage Change	1.590 (.028)	.065 (.071)
Racial Heterogeneity Change	1.590 (.028)	.053 (.068)
Youth Composition Change	1.589 (.028)	-.012 (.090)
<b>School Social Bonds</b>	<b>1.595 (.027)</b>	<b>-.751 (.076)</b>
<b>School Disorder</b>	<b>1.595 (.027)</b>	<b>.486 (.075)</b>

*Note.* Estimated using the Mplus WLSMV estimator. Age was grand mean-centered. Community covariates were *z*-standardized scores. Continuous predictors' coefficients were standardized on both *X* and *Y*. Binary predictors' coefficients were standardized on *Y* only. Each row represents a probit regression of the probability of gang involvement on the specified predictor. **Boldface** values indicate statistical significance at  $p \leq .05$ .

Table 3

*Regression of Endogenous Within Variables on Measured Covariates*

	Step 1	Step 2	Step 3	Step 4
Endogenous Variable	<i>B (SE)</i>	<i>B (SE)</i>	<i>B (SE)</i>	<i>B (SE)</i>
<b>Personal Victimization</b>				
$\beta_1$ for Male <sub>ij</sub>	.470 (.020)	.467 (.021)	.470 (.020)	
$\beta_2$ for Minority <sub>ij</sub>		.071 (.024)	.075 (.024)	
$\beta_3$ for Age <sub>ij</sub>			-.148 (.013)	
<b>Social Bonds</b>				
$\beta_1$ for Male <sub>ij</sub>	-.312 (.017)	-.311 (.017)	-.290 (.017)	-.291 (.017)
$\beta_2$ for Minority <sub>ij</sub>		-.179 (.020)	-.170 (.019)	-.170 (.019)
$\beta_3$ for Age <sub>ij</sub>			-.235 (.010)	-.231 (.010)
$\beta_4$ for Victimization <sub>ij</sub>				-.279 (.011)
<b>Fear</b>				
$\beta_1$ for Male <sub>ij</sub>	.060 (.017)	.059 (.017)	.065 (.017)	.065 (.017)
$\beta_2$ for Minority <sub>ij</sub>		.284 (.019)	.297 (.019)	.297 (.019)
$\beta_3$ for Age <sub>ij</sub>			-.129 (.012)	-.129 (.012)
$\beta_4$ for Victimization <sub>ij</sub>				.292 (.009)

*Note.* Estimated using the Mplus WLSMV estimator. Age is grand mean centered.

Coefficients of continuous predictors were standardized on both *X* and *Y*.

Coefficients of binary predictors were standardized on *Y* only.

Table 4

*Standardized Regression Coefficients for Successive Models to Predict Probability of Gang Involvement: Within Model*

	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Final
Predictor	<i>B (SE)</i>	<i>B (SE)</i>	<i>B (SE)</i>				
Student-level							
$\beta_0$ for Reference <sub><i>j</i></sub>	1.917 (.032)	1.873 (.029)	1.871 (.029)	1.871 (.029)	1.871 (.029)	1.871 (.029)	1.873 (.029)
$\beta_1$ for Male <sub><i>ij</i></sub>	<b>.304 (.029)</b>	<b>.297 (.028)</b>	<b>.297 (.028)</b>	.015 (.031)	.038 (.028)	.052 (.028)	-
$\beta_2$ for Minority <sub><i>ij</i></sub>		<b>.462 (.030)</b>	<b>.461 (.030)</b>	<b>.419 (.028)</b>	<b>.355 (.027)</b>	<b>.340 (.027)</b>	<b>.340 (.027)</b>
$\beta_3$ for Age <sub><i>ij</i></sub>			<b>.044 (.019)</b>	<b>.141 (.018)</b>	<b>-.085 (.011)</b>	<b>-.049 (.017)</b>	<b>-.050 (.018)</b>
$\beta_4$ for Personal Victimization <sub><i>ij</i></sub>				<b>.557 (.014)</b>	<b>.225 (.015)</b>	<b>.186 (.015)</b>	<b>.212 (.019)</b>
$\beta_5$ for Social Bonds <sub><i>ij</i></sub> <sup>a</sup>					<b>-.533 (.016)</b>	<b>-.538 (.016)</b>	<b>-.550 (.016)</b>
$\beta_6$ for Fear <sub><i>ij</i></sub> <sup>b</sup>						<b>.057 (.013)</b>	<b>.046 (.014)</b>
Fit indices							
RMSEA	.084	.052	.052	.038	.027	.027	.027
CFI	.851	.943	.943	.971	.985	.985	.985
SRMR (within)	.118	.118	.118	.070	.029	.027	.028
SRMR (between)	.399	.399	.399	.399	.399	.399	.399

*Note.* Estimated using the Mplus WLSMV estimator. Age was grand mean centered. Continuous predictors' coefficients were standardized on both *X* and *Y* variables. Binary predictors' coefficients were standardized on the *Y* variable only. **Boldface** values indicate statistical significance at  $p \leq .05$ .

Table 5

*Regression of Endogenous Between Variables on Measured Covariates*

Endogenous Variable	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7	Final
	<i>B (SE)</i>	<i>B (SE)</i>	<i>B (SE)</i>	<i>B (SE)</i>	<i>B (SE)</i>	<i>B (SE)</i>	<i>B (SE)</i>	<i>B (SE)</i>
<b>School Social Bonds</b>								
$\nu_{0,1}$ for Concentrated Disadvantage	<b>-.141 (.071)</b>	<b>-.148 (.074)</b>	-.126 (.076)	-.113 (.077)	-.124 (.078)	-.137 (.080)		-
$\nu_{0,2}$ for Youth Composition		.039 (.078)	.052 (.079)	.035 (.080)	.037 (.082)	.036 (.082)		-
$\nu_{0,3}$ for Racial Heterogeneity			-.089 (.075)	-.141 (.083)	-.148 (.085)	-.146 (.085)		-
$\nu_{0,4}$ for CD Change				.121 (.088)	.120 (.089)	.122 (.088)		-
$\nu_{0,5}$ for YC Change					.075 (.077)	.083 (.078)		-
$\nu_{0,6}$ for RH Change						-.055 (.075)		-
<b>School Disorder</b>								
$\nu_{0,1}$ for Concentrated Disadvantage	<b>.391 (.063)</b>	<b>.357 (.067)</b>	<b>.269 (.065)</b>	<b>.294 (.064)</b>	<b>.305 (.066)</b>	<b>.335 (.070)</b>	<b>.338 (.069)</b>	<b>.336 (.062)</b>
$\nu_{0,2}$ for Youth Composition		<b>.152 (.064)</b>	.085 (.062)	.052 (.062)	.049 (.064)	.052 (.066)	.052 (.065)	-
$\nu_{0,3}$ for Racial Heterogeneity			<b>.428 (.055)</b>	<b>.341 (.060)</b>	<b>.353 (.065)</b>	<b>.351 (.068)</b>	<b>.352 (.068)</b>	<b>.341 (.061)</b>
$\nu_{0,4}$ for CD Change				<b>.213 (.049)</b>	<b>.217 (.050)</b>	<b>.211 (.053)</b>	<b>.210 (.053)</b>	<b>.213 (.049)</b>
$\nu_{0,5}$ for YC Change					-.102 (.065)	-.132 (.068)	-.133 (.068)	-
$\nu_{0,6}$ for RH Change						<b>.164 (.068)</b>	<b>.163 (.067)</b>	<b>.128 (.062)</b>

*Note.* Estimated using the Mplus WLSMV estimator. Estimates are standardized values. Covariates are *z*-standardized. **Boldface** values indicate statistical significance at  $p \leq .05$ .

Table 6

*Standardized Regression Coefficients in Successive Models to Predict Probability of Gang Involvement: Between Model*

	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7	Step 8	Step 9
Predictor	<i>B (SE)</i>	<i>B (SE)</i>	<i>B (SE)</i>						
Community/School-level									
$\gamma_{0,0}$ Reference	1.602 (.027)	1.602 (.028)	1.602 (.028)	1.602 (.028)	1.603 (.028)	1.603 (.028)	1.603 (.028)	1.603 (.028)	1.602 (.027)
$\gamma_{0,1}$ Concentrated Disadvantage	<b>.320 (.097)</b>	<b>.322 (.103)</b>	<b>.313 (.103)</b>	<b>.313 (.102)</b>	<b>.335 (.103)</b>	<b>.336 (.104)</b>	<b>.336 (.104)</b>	.186 (.111)	-
$\gamma_{0,2}$ Youth Composition		-.011 (.123)	-.011 (.120)	-.011 (.120)	-.013 (.121)	-.013 (.121)	-.013 (.121)	-.013 (.121)	-
$\gamma_{0,3}$ Racial Heterogeneity			.163 (.093)	.163 (.093)	.179 (.094)	.179 (.095)	.179 (.095)	.023 (.098)	-
$\gamma_{0,4}$ CD Change				-.009 (.088)	-.013 (.088)	-.013 (.089)	-.013 (.089)	-.107 (.088)	-
$\gamma_{0,5}$ YC Change					-.121 (.098)	-.122 (.099)	-.122 (.099)	-.122 (.099)	-
$\gamma_{0,6}$ RH Change						.147 (.082)	.147 (.082)	.073 (.081)	-
$\gamma_{0,7}$ School Social Bonds							<b>-.685 (.075)</b>	<b>-.685 (.075)</b>	<b>-.704 (.075)</b>
$\gamma_{0,8}$ School Disorder								<b>.446 (.105)</b>	<b>.519 (.078)</b>
Fit indices									
RMSEA	.172	.173	.173	.173	.176	.176	.177	.180	.176
CFI	.000	.000	.000	.000	.000	.000	.000	.000	.000
SRMR (within)	.262	.262	.262	.262	.262	.262	.262	.262	.262
SRMR (between)	.259	.279	.279	.279	.296	.296	.270	.257	.225

*Note.* Estimated using the Mplus WLSMV estimator. Community covariates were *z*-standardized. Continuous predictors' coefficients were standardized on both *X* and *Y*. **Boldface** values indicate statistical significance at  $p \leq .05$ .

Table 7

*Standardized Coefficients from the Regression of Probability of Gang Involvement on Individual- and Group-level Predictors*

	Within	Between	Combined
Covariate	<i>B (SE)</i>	<i>B (SE)</i>	<i>B (SE)</i>
<b>Student-level</b>			
$\beta_0$ for reference	1.873 (.029)		1.879 (.031)
$\beta_1$ for Male <sub>ij</sub>	-		-
$\beta_2$ for Minority <sub>ij</sub>	<b>.340 (.027)</b>		<b>.347 (.028)</b>
$\beta_3$ for Age <sub>ij</sub>	<b>-.050 (.018)</b>		<b>-.045 (.017)</b>
$\beta_4$ for Personal Victimization <sub>ij</sub>	<b>.212 (.019)</b>		<b>.195 (.014)</b>
$\beta_5$ for Social Bonds <sub>ij</sub>	<b>-.550 (.016)</b>		<b>-.540 (.016)</b>
$\beta_7$ for Fear <sub>ij</sub>	<b>.046 (.014)</b>		<b>.053 (.013)</b>
<b>Community- &amp; School-level</b>			
$\gamma_{0,0}$		1.602 (.027)	
$\gamma_{0,1}$ for Concentrated Disadvantage		-	-
$\gamma_{0,2}$ for Youth Composition		-	-
$\gamma_{0,3}$ for Racial Heterogeneity		-	-
$\gamma_{0,4}$ for CD Change		-	-
$\gamma_{0,5}$ for YC Change		-	-
$\gamma_{0,6}$ for RH Change		-	-
$\gamma_{0,7}$ for School Social Bonds		<b>-.704 (.075)</b>	<b>-.779 (.082)</b>
$\gamma_{0,8}$ for School Disorder		<b>.519 (.078)</b>	<b>.330 (.101)</b>
<b>Fit indices</b>			
RMSEA	.027	.176	.022
CFI	.985	.000	.981
SRMR (within)	.028	.262	.028
SRMR (between)	.399	.225	.206

*Note.* Estimated using the Mplus WLSMV estimator. Age is grand mean centered. Community covariates are *z*-standardized. Continuous predictors' coefficients were standardized on both *X* and *Y* variables. Binary predictors' coefficients were standardized on the *Y* variable only.

**Boldface** values indicate statistical significance at  $p \leq .05$ .

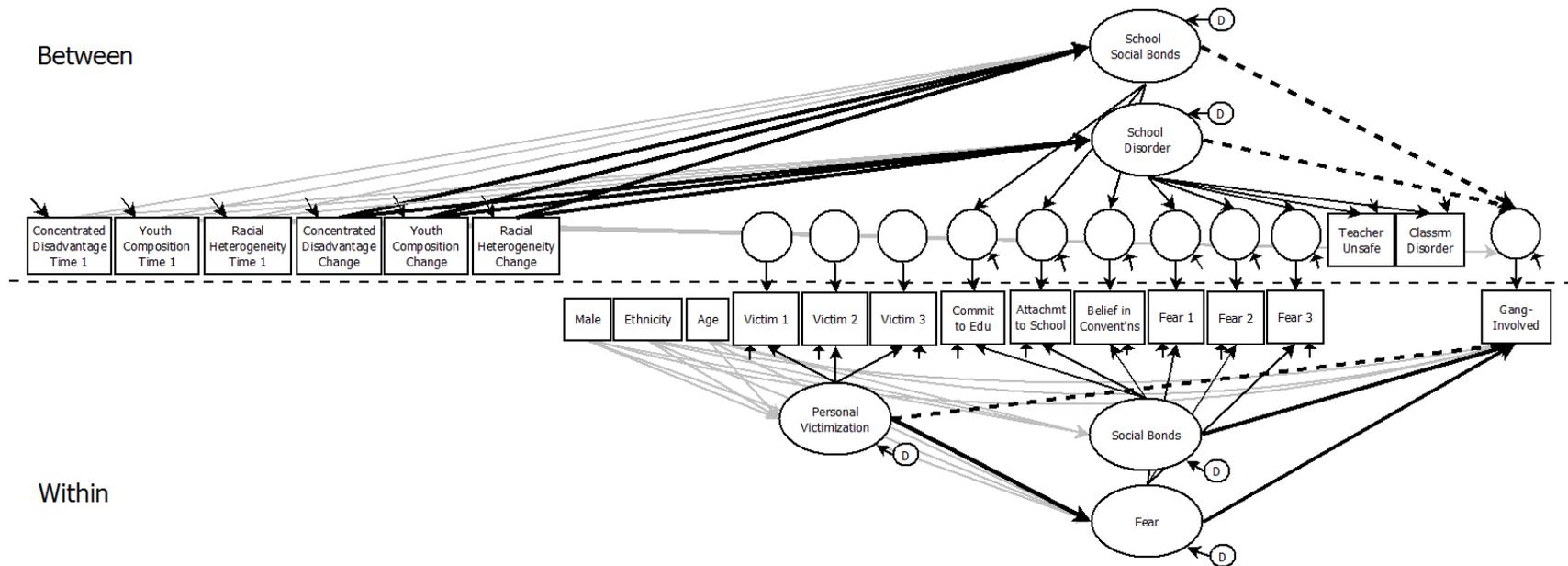
Table 8

*Model Comparisons: Standardized Estimated Effects on the Probability of Gang**Involvement*

	Fully-Recursive	Theoretical	Empirical
Covariate	<i>B (SE)</i>	<i>B (SE)</i>	<i>B (SE)</i>
<b>Student-level</b>			
$\beta_0$ for reference	1.874 (.030)	1.874 (.030)	1.879 (.031)
$\beta_1$ for Male <sub>ij</sub>	.052 (.029)	<b>.111 (.028)</b>	-
$\beta_2$ for Minority <sub>ij</sub>	<b>.347 (.028)</b>	<b>.313 (.029)</b>	<b>.347 (.028)</b>
$\beta_3$ for Age <sub>ij</sub>	<b>-.045 (.017)</b>	<b>-.067 (.017)</b>	<b>-.045 (.017)</b>
$\beta_4$ for Personal Victimization <sub>ij</sub>	<b>.185 (.015)</b>	-	<b>.195 (.014)</b>
$\beta_5$ for Social Bonds <sub>ij</sub>	<b>-.538 (.015)</b>	<b>-.600 (.014)</b>	<b>-.540 (.016)</b>
$\beta_6$ for Fear <sub>ij</sub>	<b>.056 (.013)</b>	<b>.216 (.013)</b>	<b>.053 (.013)</b>
<b>Community- &amp; School-level</b>			
$\gamma_{0,0}$			
$\gamma_{0,1}$ for Concentrated Disadvantage	.080 (.118)	<b>.290 (.116)</b>	-
$\gamma_{0,2}$ for Youth Composition	-.032 (.140)	-.066 (.131)	-
$\gamma_{0,3}$ for Racial Heterogeneity	<b>-.200 (.101)</b>	-.125 (.111)	-
$\gamma_{0,4}$ for CD Change	-.060 (.098)	-	-
$\gamma_{0,5}$ for YC Change	.016 (.109)	-	-
$\gamma_{0,6}$ for RH Change	-.025 (.076)	-	-
$\gamma_{0,7}$ for School Social Bonds	<b>-.771 (.085)</b>	-	<b>-.779 (.082)</b>
$\gamma_{0,8}$ for School Disorder	<b>.351 (.125)</b>	-	<b>.330 (.101)</b>
<b>Fit indices</b>			
RMSEA	.021	.040	.022
CFI	.987	.952	.981
SRMR (within)	.028	.070	.028
SRMR (between)	.231	.274	.206

*Note.* Estimated using the Mplus WLSMV estimator. Age is grand mean centered. Community covariates are *z*-standardized. Continuous predictors' coefficients were standardized on both *X* and *Y* variables. Binary predictors' coefficients were standardized on the *Y* variable only.

Figure 1



*Figure 1.* Theorized measurement and structural models for the application of statistical controls of individual and school/community characteristics on youth gang involvement. Paths of theoretical interest are black (and those not of interest are lighter; in gray). Dashed lines were hypothesized to be non-significant. Boxes represent measured variables; circles represent latent variables. Variables at the group level are above the horizontal dashed line and part of the between model. Variables at the individual level are below the horizontal dashed line and part of the within model.

Figure 2

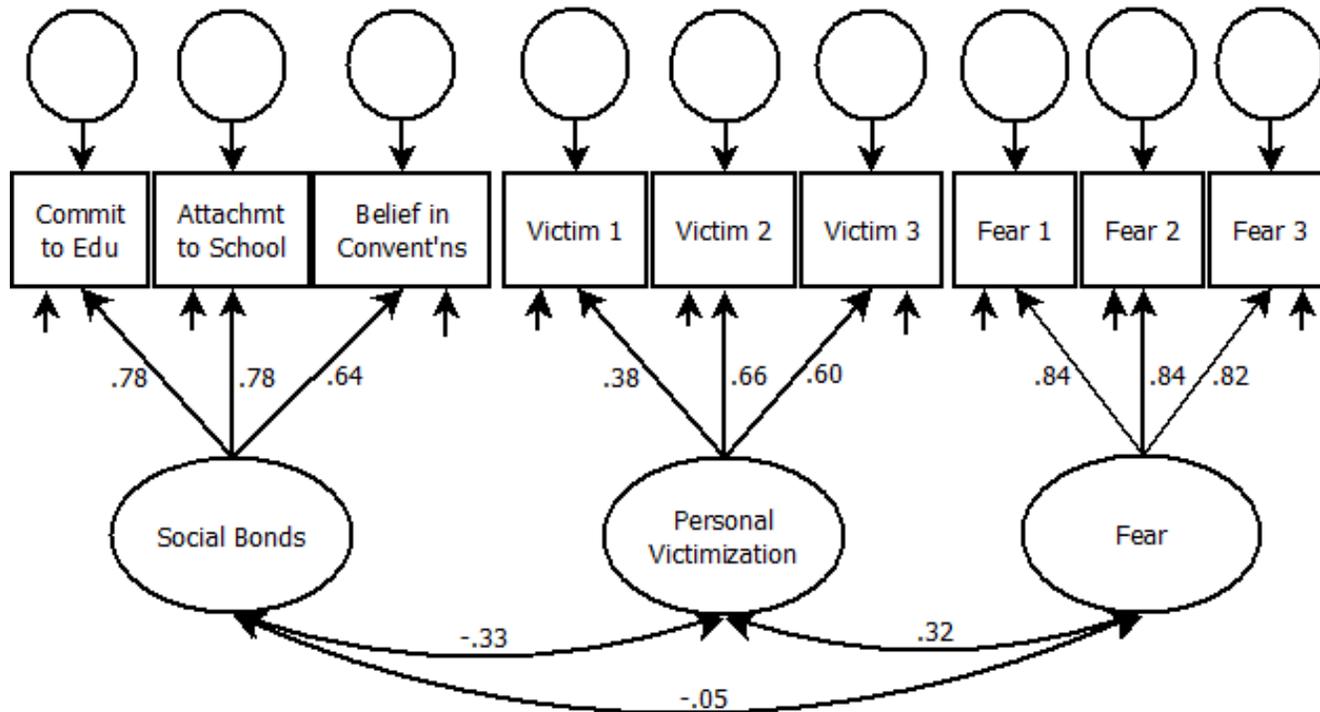


Figure 2. Model for the within- (student-) level confirmatory factor analysis.

Estimates are standardized and significant at  $p < .05$ .

Figure 3

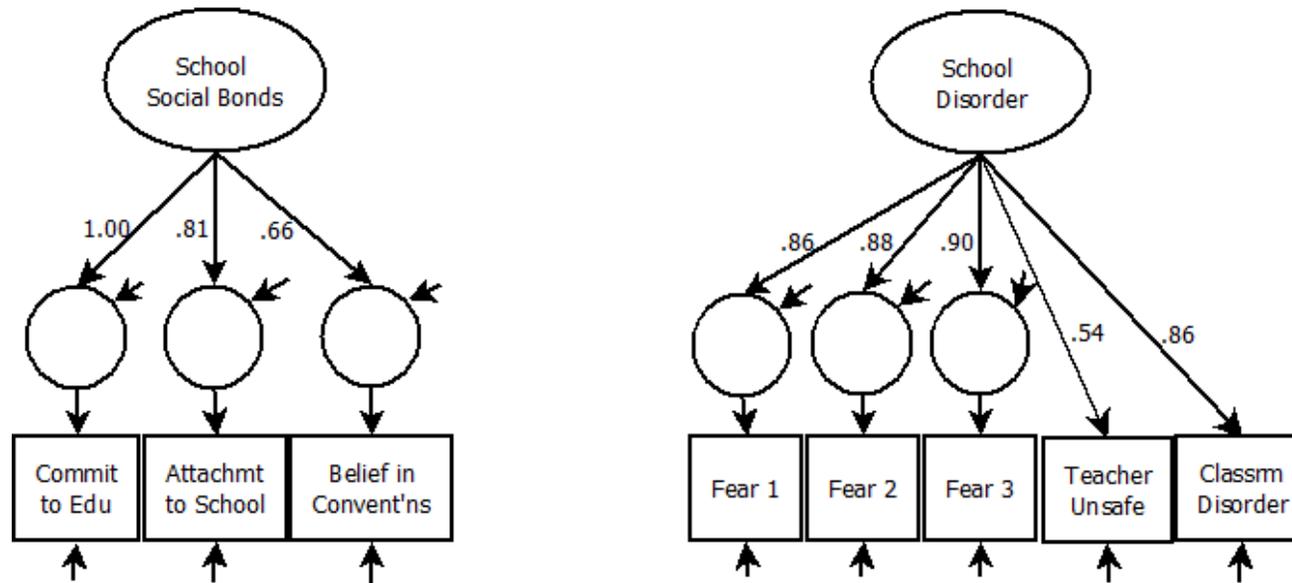


Figure 3. Model for the between- (school/community-) level confirmatory factor analysis.

Estimates are standardized and significant at  $p < .05$ .

Figure 4

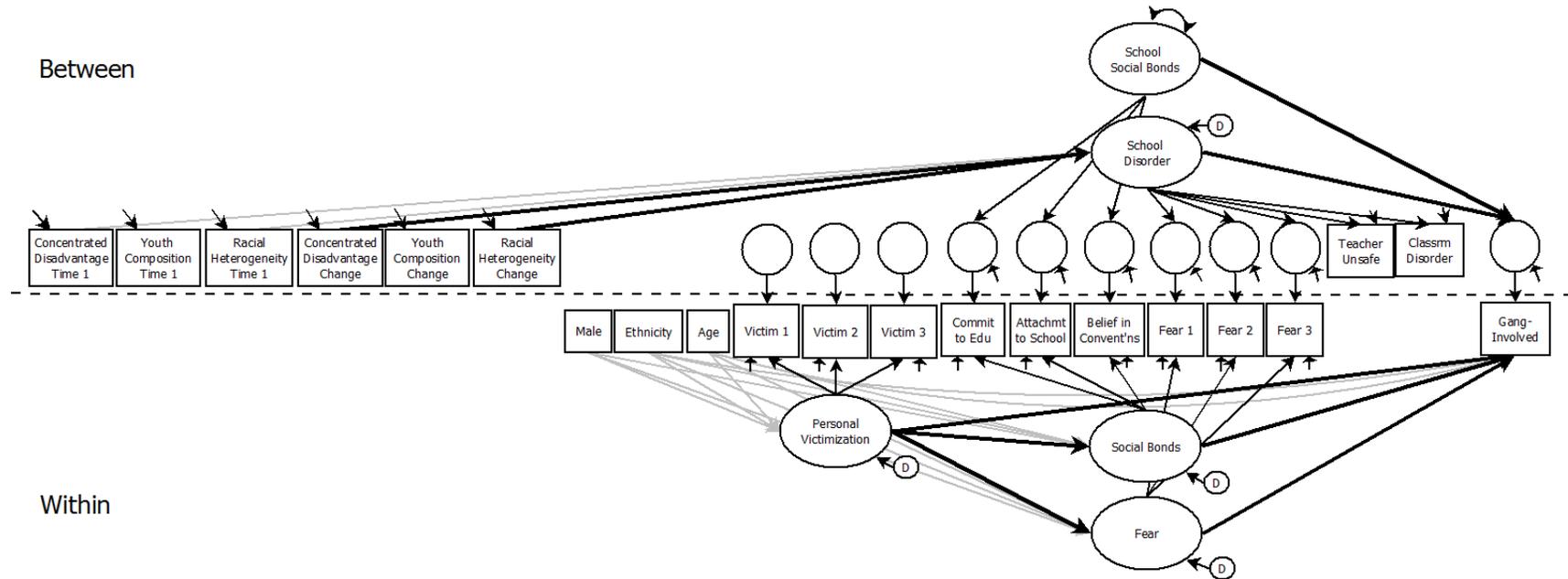


Figure 4. Results of the combined model based on an empirical procedure.

Solid lines indicate significance at  $p < .05$ .

Figure 5

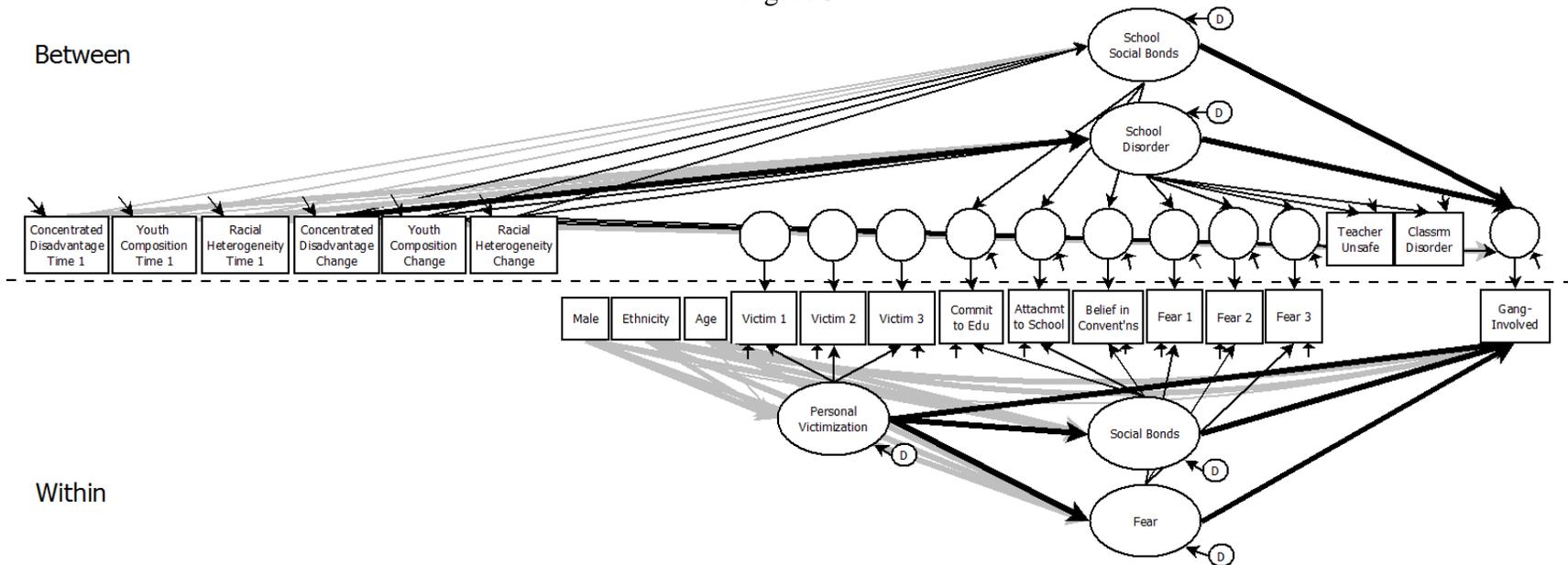


Figure 5. Results of the combined model based on the fully-recursive model.

Bolded lines indicate significance at  $p < .05$ .

Figure 6

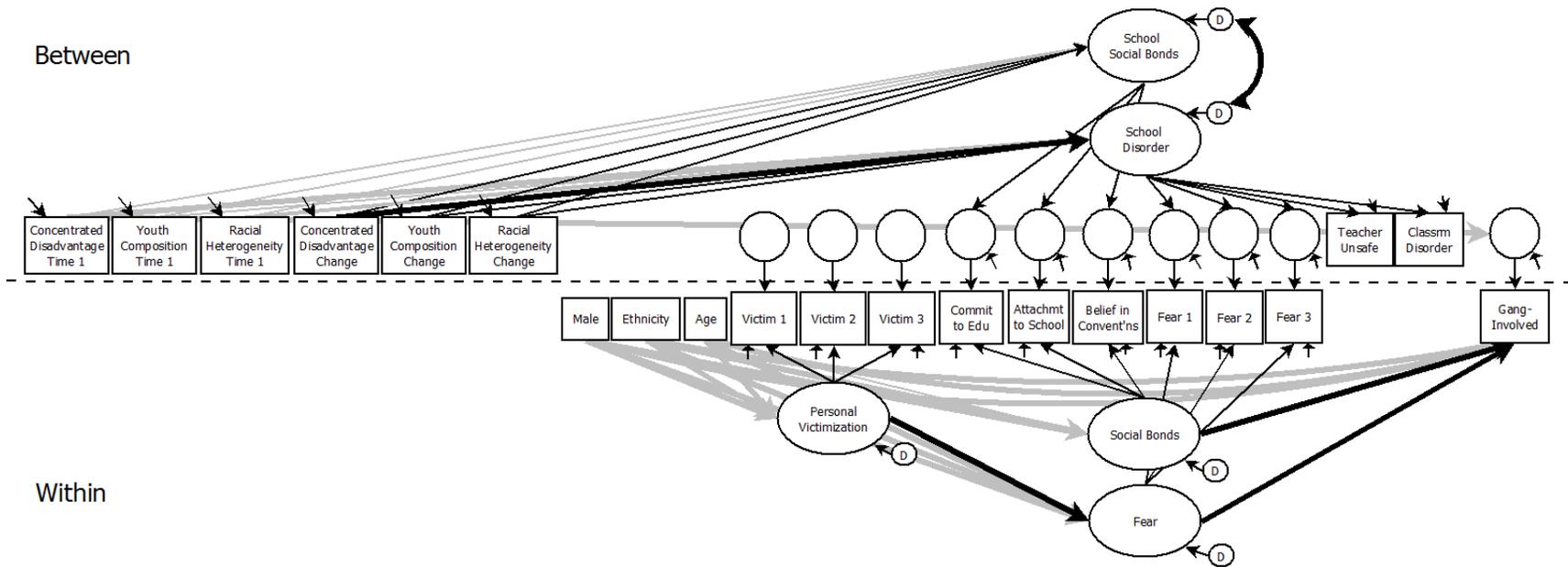


Figure 6. Results of the combined model based on the theoretical model.

Bolded lines indicate significance at  $p < .05$ .

## Appendix A

Table 9

*Alternative Model Comparisons – Includes Fair and Clear Rules: Standardized*

*Estimated Effects on the Probability of Gang Involvement in a Two-Level Model*

Covariate	Fully-Recursive <i>B (SE)</i>	Theoretical <i>B (SE)</i>	Empirical <i>B (SE)</i>
<b>Student-level</b>			
$\beta_0$ for reference	1.874 (.030)	1.874 (.030)	1.871 (.031)
$\beta_1$ for Male <sub>ij</sub>	-.037 (.030)	<b>.114 (.029)</b>	-
$\beta_2$ for Minority <sub>ij</sub>	<b>.331 (.028)</b>	<b>.316 (.029)</b>	<b>.327 (.028)</b>
$\beta_3$ for Age <sub>ij</sub>	<b>-.038 (.017)</b>	<b>-.063 (.017)</b>	<b>-.036 (.017)</b>
$\beta_4$ for Rules <sub>ij</sub>	.033 (.030)	-	-
$\beta_5$ for Social Bonds <sub>ij</sub>	<b>-.623 (.031)</b>	<b>-.591 (.013)</b>	<b>-.587 (.013)</b>
$\beta_6$ for Personal Victimization <sub>ij</sub>	<b>.341 (.014)</b>	-	<b>.332 (.013)</b>
$\beta_7$ for Fear <sub>ij</sub>	<b>.049 (.013)</b>	<b>.216 (.013)</b>	<b>.053 (.014)</b>
<b>Community- &amp; School-level</b>			
$\gamma_{0,0}$			
$\gamma_{0,1}$ for Concentrated Disadvantage	.103 (.119)	<b>.293 (.012)</b>	-
$\gamma_{0,2}$ for Youth Composition	-.037 (.137)	-.065 (.616)	-
$\gamma_{0,3}$ for Racial Heterogeneity	<b>-.223 (.102)</b>	-.125 (.110)	-
$\gamma_{0,4}$ for CD Change	-.075 (.096)	-	-
$\gamma_{0,5}$ for YC Change	-.013 (.113)	-	-
$\gamma_{0,6}$ for RH Change	-.018 (.073)	-	-
$\gamma_{0,7}$ for School Rules	-.067 (.163)	-	-
$\gamma_{0,8}$ for School Social Bonds	<b>-.625 (.161)</b>	-	<b>-.787 (.078)</b>
$\gamma_{0,9}$ for School Disorder	<b>.355 (.125)</b>	-	<b>.249 (.104)</b>
<b>Fit indices</b>			
RMSEA	.038	.040	.037
CFI	.936	.928	.934
SRMR (within)	.065	.072	.065
SRMR (between)	.219	.255	.207

*Note.* Estimated using the Mplus WLSMV estimator. Age is grand mean centered. Community covariates are z-standardized. Continuous predictors' coefficients were standardized on both X and Y variables. Binary predictors' coefficients were standardized on the Y variable only. **Boldface** values indicate statistical significance at  $p \leq .05$ .

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