ABSTRACT

THE EFFECTS OF NEIGHBORHOOD CHARACTERISTICS ON SCHOOL CRIME AND ACADEMIC ACHIEVEMENT

By

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May 2015

Many studies of the relationship among neighborhood demographics, school crime, and academic performance rely on broad categories of crime, such as a generalized number of crime incidents or suspensions. This study investigates these relationships by using specific crime categories not explored previously. The primary assumption, often made in studies of school-level phenomena, being challenged is that substance possession should be categorized with other types of school crime. This assumption is not supported by studies of adolescents and substance use. The current study found that most categories of school crime are associated with poor academic performance, single-parent homes, and low economic status while substance use and possession are not. Regression models found that family structure is a more important factor than poverty in driving school crime. Strong within-school associations among reports of robbery, battery, and assault with a deadly weapon were also found.

THE EFFECTS OF NEIGHBORHOOD CHARACTERISTICS ON SCHOOL CRIME AND ACADEMIC ACHIEVEMENT

A THESIS

Presented to the Department of Geography

California State University, Long Beach

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts in Geography

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ACKNOWLEDGEMENTS

This thesis is the culmination of efforts of so many talented and enthusiastic people. I would first like to thank my thesis chair, Dr. Christine Rodrigue. Her expertise and patience were indispensable to the completion of this project. Dr. Hyowon Ban and Professor Michael McDaniel served as my readers and provided invaluable feedback that brought this project to a level I could never have achieved on my own. Dr. Suzanne Wechsler also deserves great credit for nurturing this project to a point that enabled me to even get started. My friends and family of course were behind me every step of the way.

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CHAPTER 1

INTRODUCTION

Crime has been a serious problem in American schools for decades. Since the 1960s, it has steadily increased until reaching a high point in the early 1990s. The number of violent deaths nationwide associated with schools in 1992 was 55. However, it dropped to 16 by the year 2000 (Schools are safe 2002). Despite this improvement, violence and disorder remain a serious problem in American schools. This problem is especially severe for schools in poor neighborhoods (Welsh, Greene, and Jenkins 1999; Welsh, Stokes, and Greene 1999; Khoury-Kassabri et al. 2004; Chen 2008), inner cities (Burrow and Apel 2008; Chen 2008), and schools with a large percentage of African American students (Welsh, Greene, and Jenkins 1999; Chen 2008; Payne, Gottfredson, and Gottfredson 2003). However, the problem of crime in schools touches all students including the affluent, those in rural and suburban areas, public and private schools, and youth of all races.

Crime places enormous burdens upon schools. Students struggle to focus on the important task of learning when they fear for their safety or personal degradation. Acts of delinquency create an atmosphere of psychological unease and classroom disruption. Teachers must spend valuable class time on behavioral enforcement instead of course content. Administrators must direct resources of time on disciplinary issues and money on additional security staff.

American academic ranking has also dropped in recent decades relative to other nations (Cassidy 2013). Disruption caused by inappropriate student conduct has been found to contribute to lower academic functioning (Schwartz and Gorman 2003), and may be contributing to America's educational decline. In addition, parents fear that their son or daughter will be victimized while out of their care. All Americans have a deep interest in improving the public school system. True solutions can only be accomplished with an accurate and nuanced understanding of school crime and its causes and consequences. Many studies, which are reviewed in detail below, have contributed valuable insight into the problems of school crime, its association with poor academic performance, and the neighborhood characteristics that contribute to them. This paper attempts to build on that research by studying specific crime categories not dealt with in previous literature.

Goals

The goal of this study is to analyze the relationship between neighborhood demographic factors, crime in schools, and academic performance. A large number of studies have explored the conditions of adolescent drug use and, to a lesser extent, possession of weapons as specific categories of delinquency. Here delinquency is understood as crimes by minors. In particular, this study is concerned with acts of delinquency committed in and near schools. The categories of adolescent crime in this study are expanded to include both weapons and chemical possession as well as assault with a deadly weapon (ADW), battery, property crimes, loiter-trespass, robbery, and sex offenses. The specific crime categories included are often studied more broadly as either youth violence or delinquency. However, these categories of crime differ in their

seriousness, which makes equating them a less precise measure for gaining the greatest possible understanding of the nature of school crime. For example, ADW is a more serious level of attack than battery. Both are more serious than property crimes, many of which are likely adolescents creating graffiti or "tagging." Although most of these categories of delinquency are correlated, they are qualitatively different from each other in important ways. Acts of battery are most often committed between males, whereas sex offenses are generally committed by males upon females. Some gendered patterns of violence may emerge between schools. For example, a given school or set of school characteristics may be likely to promote or discourage battery between males, whereas another school or set of school characteristics may promote or discourage sex offenses. Another example is that battery can erupt spontaneously from friction between students, whereas a robbery implies at least some premeditation. A fight can occur when both parties feel that they were initially wronged while robbery is more clearly defined in terms of victim and perpetrator. Demographic factors may provide clues to further understanding these differences. Additionally, some of these crime categories--specifically ADW, loiter-trespass, and sex offenses--receive virtually no attention in other works that explore school crime and neighborhood demographics.

To achieve these goals, this study will test the statistical relationships among the academic achievement in math and English as measured by a state issued standardized test, school crimes as measured by incidents of ADW, battery, chemical substance abuse (CSA), property crime, loiter-trespass, weapons possession, robbery, sex offenses, total crimes, and total crimes omitting CSA as well as demographic factors within the zip code

of the school including percentage of homeowners, percentage of high school graduates, percentage of bachelor's degree holders, median family income, percentage of families below the poverty line, percentage of households classified as married with children relative to total households, percentage of households classified as female-headed with children relative to total households, and the ratio of households classified as married with children to female-headed households with children. The last three listed variables attempt to resolve which aspect of family structure has the most influence. The ratio of households attempts to discern whether it is the mix of family structures, and not the strait percentage of one or the other family structure, that is most significant in determining school characteristics.

Background and Study Area

This study will examine the Los Angeles Unified School District (LAUSD) as a study area (shown in Figures 1 and 2). LAUSD is the second largest school district in the nation with an enrollment of over 677,000 K-12 students, according to lausd.net as of October 2010. These students attend the 1,092 elementary, middle, and senior high schools as well as a number of specialty schools, such as charter, continuation senior high, and special education. Hispanics comprise a large majority of the LAUSD student population at 73.4 percent, followed by African Americans at 10.2 percent, Caucasians at 9.5 percent, and Asians at 5.9 percent. No other group, including Filipino or Pacific Islander, reaches the 1 percent level. This ethnic diversity is reflective of the large geographical extent covered by LAUSD, which measures 710 square miles. It covers much of the San Fernando Valley in the north to San Pedro in the south, Venice and Pacific Palisades on the west coast to South Gate and Bell in the east. Gaps in the

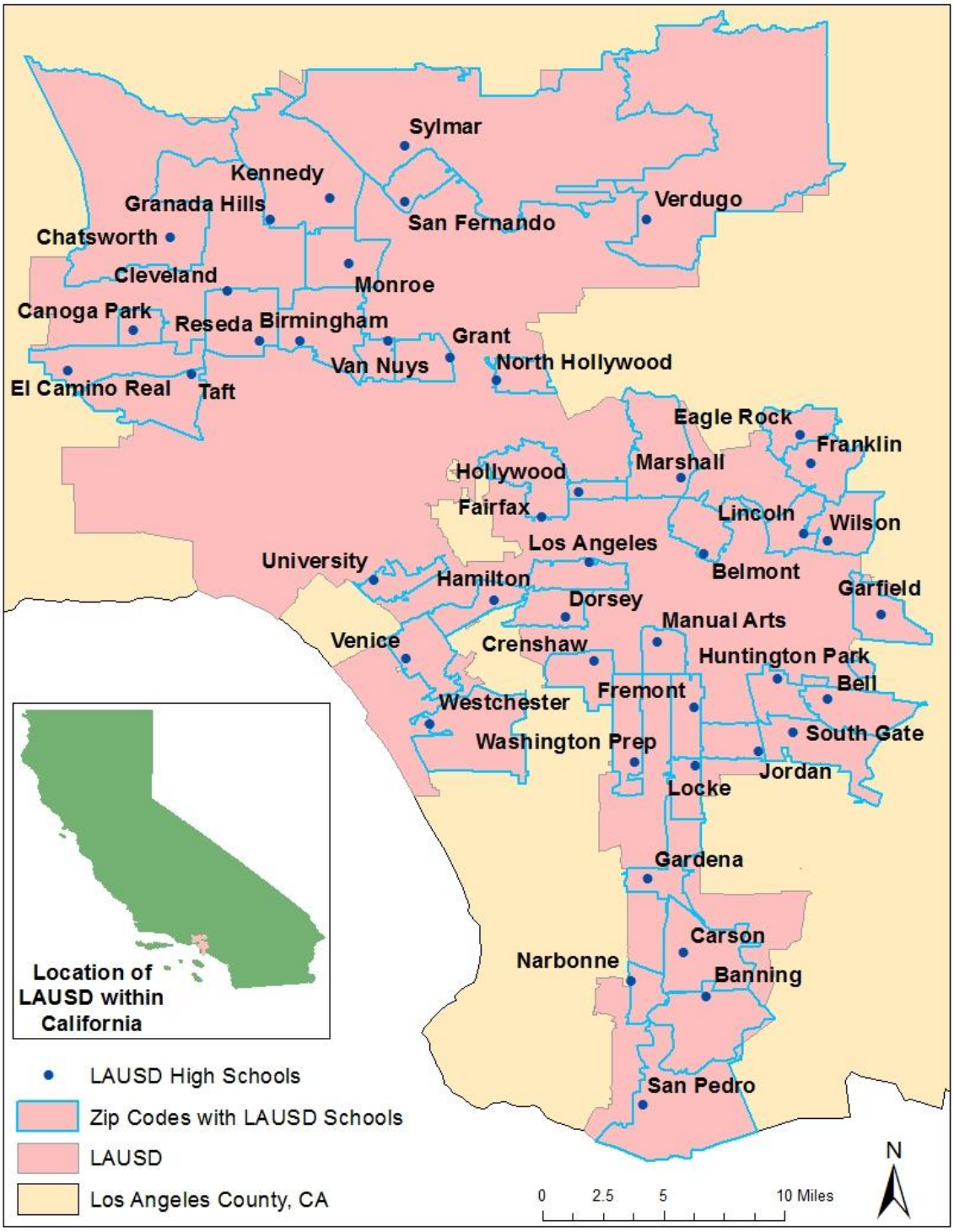

FIGURE 1. LAUSD high schools.

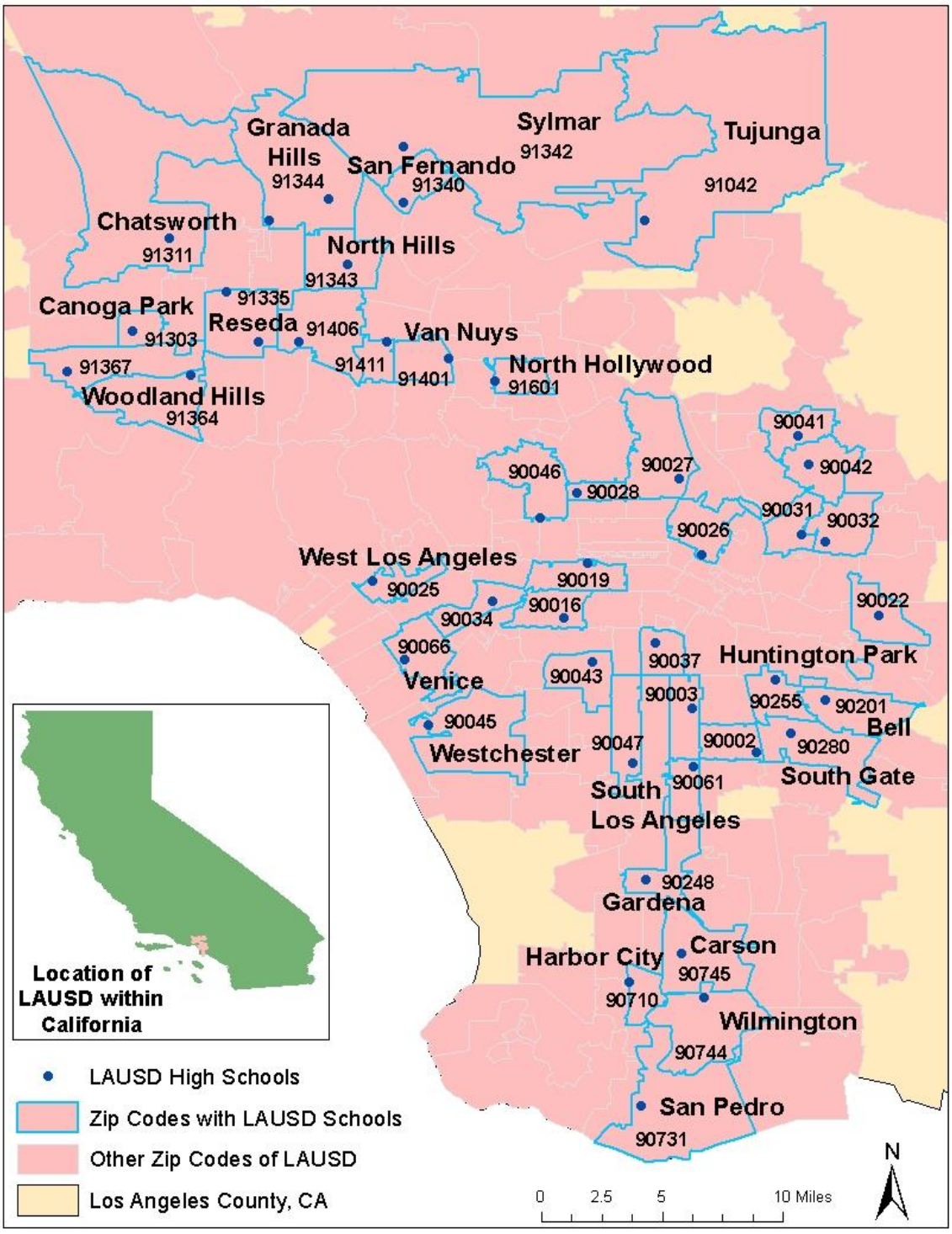

FIGURE 2. Zip codes and cities of LAUSD schools.

LAUSD polygon include Beverly Hills, Santa Monica, and a stretch of primarily coastal areas from Culver City and El Segundo to Rancho Palos Verdes. According to the National Center for Education Statistics, the total LAUSD expenditure for 2009-2010 was $10,244,106,000 and $14,768 per student. This amount covers the cost of the 68,902 staff, including 31,748 teachers.

Serious crime in LAUSD schools has a history that is decades long. In 1998 the problem persisted at such a level that school police sought permission to increase their firepower to 12-gauge shotguns for schools in more dangerous neighborhoods (Helfand 1998). In the 1999-2000 school year, three of the four murders that occurred at or near California schools occurred in LAUSD (Moilanen 2001). Many of the homicides attributed to schools in fact occur while students are en route to and from school, as these three incidents did. A recent incident that did occur on the campus of Gardena High School made national news (Students shot and wounded in L.A. school [3:45 p.m.] 2011). In January of 2011, a gun brought by a 15-year-old student discharged in class. Two students were injured by the single bullet. Fortunately, both survived. Although the shooting was apparently accidental, the fact that a student felt inclined to bring a firearm to school is symptomatic of the breakdown of order that has occurred in many LAUSD schools. A lunch time brawl between African Americans and Hispanics involving 300 students occurred at Locke High School in April of 2003 (Hayasaki 2003). Eight students were injured, though none seriously. Four students were transferred to other schools, eleven were suspended, and three were arrested while three non-students were also arrested for the incident. There were reports of guns, baseball bats, knives, and thrown chairs. Another less serious incident occurred at Dorsey High School in 2010

when the equipment of the baseball team was stolen including uniforms, gloves, bats, and a pitching machine (Barnes 2010). The cash-strapped team was forced to play official games without uniforms. Although this incident involved no physical violence, undoubtedly the members of the team felt justifiably angry and violated.

Clearly such events can only disrupt the learning environment and sense of order and justice on campus. It is incumbent upon researchers to better understand why acts of delinquency are occurring at schools with such high frequency and how they can best be prevented. This study is designed to determine which neighborhood factors are most impacting crime and academic achievement in local schools. This study will also analyze which particular crimes are being impacted by those factors so that policymakers will have the knowledge to best ameliorate or compensate for those effects.

CHAPTER 2

LITERATURE REVIEW

The background literature will be reviewed in this chapter. For the purposes of discussion, it has been divided into the following themes: demographic factors and school victimization; demographic factors and substance use; demographic factors and academic achievement; relationships of weapons possession with academic achievement and school violence; and academic achievement and substance use. The chapter concludes with the hypotheses that will be evaluated later in this thesis.

Demographic Factors and School Victimization

The relationship between neighborhood demographics and school disorder is complicated by the fact that each school affects students differently. Some schools are run more effectively than others. This diminishes the amount of disorder within, even when comparing schools that have similar demographic profiles. Disorder has been found to be minimized by a number of school-based factors including clear and fair policies, positive student/teacher relationships, and smaller class sizes (Khoury-Kassabri et al. 2004). Despite the fact that schools impact the occurrence of delinquency, several trends can also be recognized from the literature regarding the effect of neighborhoods on school disorder.

For instance, the connection between low socioeconomic status and school disorder has been well established (Welsh, Greene, and Jenkins 1999; Welsh, Stokes, and Greene 1999; Khoury-Kassabri et al. 2004; Chen 2008). Clark and Lab (2000) found small relationships between school thefts, but not school assault or robbery, with community levels of high female employment, low male employment, and low family income. Welsh, Stokes, and Greene (1999) added that the connection between local poverty and school disorder was mediated by school attendance instability. Chen (2008) found school attendance instability to be one of the strongest predictors of school crime. Beyers et al. (2003) found the connection to be stable over time for students aged 11, 12, and 13. However, the findings regarding the connection between residential stability and school disorder have been mixed. Burrow and Apel (2008) found a connection between residential instability and assault, but not larceny. Some studies find no connection at all (Welsh, Greene, and Jenkins 1999). Clark and Lab (2000) used a housing measure that included owner occupancy, vacancy rates, or residential mobility and similarly found no connection.

Burrow and Apel (2008) found central city residence to be positively related to both larceny and assault. Other studies have found central city residence to be related to school crime in general (Chen 2008). Chen (2008) argues that this relationship is at least somewhat attributable to the fact that centrally located schools typically have higher enrollment numbers, which is associated with more school disorder.

Williams et al. (2002) found that students from two-parent households were less likely to be suspended. This is likely because students from single-parent households

are reported by their teachers to participate in more aggressive behavior (Beyers et al. 2003). Burrow and Apel (2008) also found that students not from an intact family were much more likely to be victimized by assault but not by larceny.

A connection between community and school crime is surprisingly not found in most studies (Welsh, Greene, and Jenkins 1999; Welsh, Stokes, and Greene 1999; Khouri-Kassabri et al. 2004; Limbos and Casteel 2008). Clark and Lab (2000) found no relationship between school crimes including assault, theft, and robbery and any of the neighborhood arrest categories measured, including drugs, weapons, disorderly conduct, or property arrests. Chen (2008) found a correlation between community and school crime but argued that it lost its predictive power when other associated factors were included in the analysis. In contrast, neighborhoods displaying some measured form of visually observable disorganization have been consistently connected to some form of school misbehavior. Limbos and Casteel (2008) found a connection between school crime and a visual survey of neighborhood dilapidation. Williams et al. (2002) found an association between a student being from a neighborhood characterized by deterioration and that student's rate of suspension. Others found no such connection (Clark and Lab 2000).

The body of literature that divides school crime by category remains in a state requiring further exploration. Those studies that do so often divide school crimes into only two or three categories. One such study is Payne, Gottfredson, and Gottfredson (2003) which divides school crime into teacher victimization, which is defined by crimes or incivility directed toward teachers; student victimization, such as theft or physical

attacks; and delinquency, which it defines as a broad category encompassing both of the aforementioned categories as well as property damage. They found that high concentrations of poverty, African Americans, and residential overcrowding were most related to teacher victimization. Schools located in areas of high poverty and a high percentage of African Americans were also found to be significantly associated with student delinquency but not student victimization. Others have also found more misconduct from minority students (Welsh, Greene, and Jenkins 1999; Chen 2008).

In conclusion, the demographic factors that appear to contribute to adolescent school crimes and will be included in this study are low socioeconomic status, residential mobility, and family structure. Interestingly, there is very little connection found between neighborhood and school crime. Of the few studies that divided delinquency into categories, only Clark and Lab (2000) and Burrow and Apel (2008) have any categories in common. Unfortunately, none of their findings corroborate the other, which makes drawing meaningful conclusions impossible. Clearly this is an area in need of deeper understanding.

Demographic Factors and Substance Use

In comparison to violence and other forms of adolescent misbehavior, substance use shows very different demographic patterns. High rates of community unemployment, specifically for adult males, were found to increase the likelihood of substance use, measured as a composite, including alcohol (Hoffmann 2002). In a survey of drinking in the past 30 days for individuals between the ages of 14 to 20, Song et al. (2009) found higher rates of drinking for those from communities with high rates of

unemployment but, paradoxically, also higher rates of drinking in communities with high median income. Consistent with these findings are the studies showing that high levels of poverty actually predict less substance use (Chuang et al. 2005; Winstanley et al. 2008; Botticello 2009). The association between adolescent substance use and high economic status is particularly pronounced by the twelfth grade, which in part may be due to the fact that many high school seniors socialize with college students (O'Malley et al. 2006). Perhaps this relationship can be partially explained by the finding that high income neighborhoods are associated with parental drinking, which itself is associated with adolescent drinking (Chuang et al. 2005). Another explanation is that only adolescents with access to money can afford to obtain substances (Eitle and Eitle 2004). Other studies did not find any association between income and substance use at the family level (Musick, Seltzer, and Schwartz 2008; Brenner, Bauermeister, and Zimmerman 2011) or found an association only for alcohol but not illicit drugs (Bisset, Markham, and Aveyard 2007).

High levels of community married-couple families and grandparents as primary caregivers both predicted lower odds of past 30-day drinking, while living with a single-parent predicted increased binge drinking (Song et al. 2009). Examining several possible family structure categories including mother only, mother-stepfather, father only, father-stepmother, and other family type, Hoffman (2002) found significantly elevated drug use for adolescents not living with both their mother and father, even when community-level variables were controlled. For Musick, Seltzer, and Schwartz (2008) elevated substance abuse levels were associated with an unmarried mother. Both

parental closeness and parental monitoring are predictors of lower adolescent substance abuse (Chuang et al. 2005). Perhaps this finding can partially illuminate why, despite their best efforts, single-parent homes predict higher substance use since one parent likely has less time to monitor their children than two parents would.

Eitle and Eitle (2004) found more substance use in schools located in areas with patterns of high population density or racial segregation. For binge drinking, researchers have found associations at the individual level with being white and at the community-level for percent white (Song et al. 2009). Musick, Seltzer, and Schwartz (2008) found that white youth were not more likely to engage in substance use than Hispanics, but found significantly higher substance use in white youth when compared to black youth and the "other race" category, which was predominantly Asian. The significantly higher adolescent substance use levels in the white community when compared to the black community, particularly as it pertains to alcohol use, has been replicated elsewhere (Allison et al. 1999; Winstanley et al. 2008; Botticello 2009; Brenner, Bauermeister, and Zimmerman 2011).

This difference can be quite dramatic. For example, African American students have been found five times more likely than European Americans to be non-users at both the eighth and eleventh grade (Ludden and Eccles 2007). O'Malley et al. (2006) found greater use at significance levels in almost all measures by white adolescents when compared to African Americans at eighth, tenth, and twelfth grade for nearly every category of drug use including alcohol, cigarettes, marijuana, inhalants, LSD, ecstasy, cocaine, heroin, and amphetamines. Only measures in marijuana usage, particularly at

the eighth grade measures, were comparable. These same measures comparing whites and Hispanics found greater usage by white youth in many categories, though several measures were similar. The similarity of alcohol use between white and Hispanic youth has been replicated elsewhere (Cleveland and Wiebe 2003). At the school-level, a low percentage of nonwhite students was found to be associated with higher substance incident rates (Eitle and Eitle 2004).

Adolescents from neighborhoods with a high percentage of college educated residents show elevated rates of heavy drinking (Botticello 2009). This may suggest that parents are picking up enduring drinking habits in college and youth are likely to model their behavior upon the adults around them. In contrast, the education level of the adolescent's mother has elsewhere not been found to have a relationship with the adolescent's substance use (Musick, Seltzer, and Schwartz 2008; Brenner, Bauermeister, and Zimmerman 2011).

Many other community factors that are not directly related to demographics have been found to predict either substance use or the absence of use. Neighborhood levels of adult disapproval of smoking, drinking, and marijuana use were found to have a mild negative association with adolescent use of each respective category, while community levels of adult use were associated with elevated levels of adolescent use in each respective category (Musick, Seltzer, and Schwartz 2008). Increased substance use by peers is one of the primary predictors of an individual adolescent's use (Botticello 2009; Brenner, Bauermeister, and Zimmerman 2011). Cleveland and Wiebe (2003) found that the peer effects for tobacco and alcohol were particularly impactful in schools with

overall elevated levels of use. The risk for moderate drinking, as opposed to heavy drinking, has been found to be greater in schools with relatively high perceived safety (Ennett et al. 1997; Botticello 2009). Elevated substance use has been found in schools where the students feel a low sense of school attachment (Ennett et al. 1997; Eitle and Eitle 2004). Less experienced faculty in a school is associated with greater substance use as well (Eitle and Eitle 2004). Likely related to more experienced faculty, schools with authoritative discipline structures tend to have lower levels of substance use among their students (Bisset, Markham, and Aveyard 2007).

The findings in some studies complicate and also appear contradictory to the overall finding of elevated adolescent substance use occurring in areas of higher income. For example, also associated with elevated adolescent substance use are perceptions of neighborhood danger as well as perceptions of neighborhood substance use (Lambert et al. 2004). This finding indicates that there may be a contrast in the positive correlation of substance use and income, a variable which likely indicates a safer neighborhood in reality, versus the positive correlation between substance use and the perception of danger. Winstanley et al. (2008) found similar adolescent substance use in areas with high levels of neighborhood disorganization, based on a survey including perceived crime and social capital. While the finding that high neighborhood disorganization correlated with adolescent substance use seems reasonable, this again appears to contradict the finding that adolescent substance use correlates with higher income. Is it the case that adolescent substance use occurs at elevated levels in both socially disorganized and likely very poor neighborhoods and also occurs in economically upper class neighborhoods, but

occurs at diminished levels in the neighborhoods between? This research creates enough contradictions that further studies will be needed to bring clarity.

Demographic Factors and Academic Achievement

Low socioeconomic status is often associated with low academic achievement. Carpiano, Lloyd, and Hertzman (2009) found that increases in economic status had the sharpest impact on academics at low economic levels, came to a plateau at middle levels, and actually dipped slightly for many academic measures at the highest levels of concentrations of affluence. Similarly, Dupere et al. (2010) found that vocabulary, reading, and math achievement improved with neighborhood socioeconomic advantage up to approximately one standard deviation above the mean. Brooks-Gunn et al. (1993) found that while the presence of low income neighbors had only a trivial impact on IQ, the presence of affluent neighbors had a substantial positive impact. The presence of high income residents has also been found to predict more time spent on homework and higher scores on achievement tests (Ainsworth 2002). Kawaleski-Jones, Dunifon, and Ream (2006) found a relationship between youth in low economic situations and math scores, reading scores, and classroom disruption. Taken together, these findings suggest that low economics explain poor grades and test scores largely as a result of less time spent on homework and more classroom dysfunction.

Brooks-Gunn et al. (1993) found the relationship between the number of high school dropouts to be positive with the fraction of female-headed households and negative with percentage of residents in managerial/professional positions. Dupere et al. (2010) found a strong connection between a child's test scores and his/her mother's

education and vocabulary. Parents' education level is associated with a student's attendance of post-secondary education (Plotnick and Hoffman 1999). A relationship has been found between home academic environment with both school engagement and performance (Powers, Bowen, and Rose 2005). Plotnick and Hoffman (1999) found the neighborhood characteristics of female-headed households, families receiving public assistance, and low-income families all predicted lower rates of post-secondary schooling. However, only female-headed households maintained the relationship when controlling for family background.

Residential mobility is often found to impact academic behavioral factors, but to be an insignificant factor on testing measures. Ainsworth (2002) found residential mobility to affect time spent on homework but not math and reading test scores. When controlling for income and family structure, Kawaleski-Jones, Dunifon, and Ream (2006) similarly found that residential instability was positively associated with classroom disruption, but not related to any academic testing measure. Crowder and South (2003) added further nuance to that understanding by finding residential mobility as measured by "in current residence for three or more years" impacted students' dropout rates only in neighborhoods of high social disorganization. Ainsworth (2002) added that the presence of high-status residents diminishes the impact of residential instability. What can be generalized from these findings is that residential stability is found not to be a factor in academic testing when other factors such as income and family structure are controlled. However, the impact of residential mobility has been found in academic behaviors, such as disruption, time spent on homework, and dropping out of high school.

Also, residential stability seems to be primarily a factor in neighborhoods that have factors associated with low economic status or functioning, such as high social disorganization or the absence of high-status residents.

The impact of neighborhood social disorganization on academic achievement is generally quite substantial. One commonly referenced definition of social organization stresses neighborhood ability, "to realize the common values of residents and maintain effective social controls" (Sampson, Raudenbush, and Earls 1997, page 918). In fact, Bowen, Bowen, and Ware (2002) found it to have the greatest relationship with academic measures of any variables tested, including individual family variables. Williams et al. (2002) found a relationship between neighborhood deterioration and an individual student's GPA and intention to complete high school. Crowder and South (2003) found that the high school dropout rate in areas of high social organization was similar for adolescents from single-parent and two-parent households. In two-parent households the impact of social disorganization rises only slightly while the increase is sharp for single-parent households. They also found that the educational impact of low income to family need ratio was exacerbated by neighborhood disorganization.

In summation, higher socioeconomic status, single-parent households, parental education levels and involvement, and neighborhood social disorganization have all been found to contribute to most of the educational measures attained by youth. Residential mobility is negatively associated with academic behaviors but has no additional impact on testing measures. The inclusion of several of these variables in the current study may add additional nuance to the current understanding.

Relationships of Weapons Possession

According to a national survey, 9.6 percent of students between grades 9-12 had brought a weapon to school in the previous 30 days (Simon, Crosby, and Dahlberg 1999). In a survey of 55 schools, Watkins (2008) found a range in the percentages of students at a given school who have carried weapons to be from less than 1 percent to 15 percent. Adolescent weapons possession at school is highly correlated with an individual committing or being victimized by delinquent behaviors.

Rudatsikira et al. (2007) found that youths were six times more likely to carry a weapon if they had experienced either physical or relational victimization, such as name-calling or rejection, six times more likely if they feared for their safety, three times if they had been threatened with a weapon, and two-and-a-half times more likely if they had property stolen or damaged. Watkins (2008) concluded that students were three times as likely to bring a weapon to school whether they had been a victim or a witness of a weapon crime within the previous year. Bailey, Flewelling, and Rosenbaum (1997) found similar relationships for students bringing weapons to school: approximately five times more likely for illicit drug users; four times for binge drinkers; four times for fighting in the last year; six times for damaging school property; five times for attacking someone; three times for having been robbed at school; three times for having been attacked at school; and five times for an awareness of others bringing weapons to school. Binge drinking, being involved in a fight, and damaging school property were also found to have an independent effect on school weapons carrying. By far the largest independent effect was seen for others at school bringing weapons. The relationship between

substances and school weapons was substantiated by the finding that students that smoke daily were eight times more likely to bring a firearm to school (DuRant et al. 1999).

Molnar et al. (2004) found more concealed firearms among youth from neighborhoods that were poor and physically disordered. Students attending schools where more than 10 percent of the population received subsidized lunches were more likely to carry a weapon to school (Simon, Crosby, and Dahlberg 1999). Bailey, Flewelling, and Rosenbaum (1997) did not find any relationship between school weapons carrying and urban versus suburban comparisons. Living with both parents did significantly diminish a student's likelihood of campus weapons possession. Odds of carrying a weapon to school were increased for students with neither parent having graduated high school (Simon, Crosby, and Dahlberg 1999). In contrast, Watkins (2008) did not find a relationship at the school level of weapons carrying and neighborhood disadvantage, mobility, or violent crime.

Watkins (2008) found school weapons possession associated with suspensions but not GPA. It should be remembered when analyzing these findings that GPA standards often fluctuate substantially between schools and this study involved over 20,000 students in 80 high schools and 80 middle schools. This lack of association between GPA and weapons possession may be in part due to the confounding influence of variable grading standards that occur between schools. More specifically, many struggling schools must inflate grades to compensate for lack of student effort (U.S. News 2011). Using an alternative measure of academic achievement, DuRant et al. (1999) found a negative relationship between academic self-assessment and bringing a firearm to school.

Although students who bring firearms to school are more likely to bring other weapons as well (DuRant et al. 1999), it is possible that the relationship between the relevant variables and firearms vs. blades or clubs are substantially different, at least in degree.

The clear pattern that emerges from the literature is that weapons possession is associated with many negative academic and delinquency behaviors. Unfortunately, students from poor and unsafe neighborhoods also appear to fall prey to the habit of carrying weapons at school, perhaps with understandable reason.

Academic Achievement and School Violence

Studies on the impact of aggression at school on academic performance are often written in terms of bullying as opposed to school crime. Both share the feature of creating an atmosphere of victimization and disruption within the school. Nansel et al. (2001) explains the phenomenon of bullying as:

> A specific type of aggression in which (1) the behavior is intended to harm or disturb, (2) the behavior occurs repeatedly over time, and (3) there is an imbalance of power, with a more powerful person or group attacking a less powerful one. This asymmetry of power may be physical or psychological, and the aggressive behavior may be verbal (e.g., name-calling, threats), physical (e.g., hitting), or psychological (e.g., rumors, shunning/exclusion). (2094)

Bullying seems to reach a high point in K-12 education between the sixth and eighth grade (Nansel et al. 2001). Boys are more likely than girls both to bully and be the victim of bullying (Nansel et al. 2001; Nishina, Juvonen, and Witkow 2005). Boys are more likely to be bullied physically (Juvonen, Nishina, and Graham 2000; Nansel et al. 2001; Boulton, Trueman, and Murray 2008), verbally (Boulton, Trueman, and Murray 2008), through social exclusion (Boulton, Trueman, and Murray 2008), and through property theft or damage (Juvonen, Nishina, and Graham 2000), while girls are more likely to be bullied

through rumors or sexual comments (Nansel et al. 2001). Burrow and Apel (2008) found that middle school students are more likely to be victimized at school while high school students are more likely to be victimized while away from school. Victimization levels for the individual tend to show moderate stability over time (Juvonen, Nishina, and Graham 2000; Hanish and Guerra 2002).

There are essentially four categories of students whose academic achievement is impacted by peer victimization: victims, bullies, witnesses, and students who are both, at different times, victims and bullies. Youths in this fourth category are often referred to as victim/bullies in the literature. Being a bully tends to be associated with externalizing problems, while being the victim of bullying shows associations with both internalizing and externalizing problems (Janosz et al. 2008). Schwartz and Gorman (2003) discuss a similar idea to the internalization/externalization construct, both occurring in the context of victimization: disruptive behaviors, which include aggression, hyperactivity, impulsiveness, and off-task behavior, as well as symptoms of depression, which include intrusive thoughts, poor concentration, low energy, and decreased motivation. These examples of internalizing behaviors clearly diminish an individual student's capacity to learn, while the externalizing behaviors clearly diminish both the individual student's and his/her classmates' capacity to learn.

The path between being victimized at school and diminished academic performance has been found to be mediated by psychological adjustment including feelings of low self-worth, depression, and loneliness (Juvonen, Nishina, and Graham 2000; Nishina, Juvonen, and Witkow 2005). Peer victimization has even been found to be

associated with physical symptoms of illness which can lead to increased school absences (Nishina, Juvonen, and Witkow 2005). In keeping with the idea that victimization can cause externalization problems is the finding that peer victimization and achievement are mediated by conduct problems and hyperactivity/inattention (Beran and Lupart 2009). The idea of effortful control, a psychological construct referring to an ability to attend to relevant information and engage in appropriate behavior across domains, also mediates the relationship between victimization and academic achievement (Iyer et al. 2010).

Similarly, Boulton, Trueman, and Murray (2008) found peer victimization to be significantly correlated with disrupted classroom concentration. In addition, it was found that each of the three subtypes of victimization measured – physical, verbal, and social exclusion – was a unique significant predictor for disrupted concentration when controlling for the other subtypes. It was also found that each of the victimization subtypes was significantly correlated when measured according to self-report, and even more strongly correlated when measured by peer-reports. The three self-reported victimization subtypes did not statistically differ in their effect on classroom concentration, and neither did the subtypes differ when peer-reported. However, self-reported victimization did slightly correlate more with disrupted concentration than did peer-reported victimization. Fear of future victimization was highest for verbal, then physical, and lowest for social exclusion.

Burrow and Apel (2008) also found that underperforming students were more likely to be victimized by both assault and larceny. They found that assault was associated with school disorder which they defined as “the presence of such factors as

gangs, hate-related graffiti, and the availability of drugs or guns in school." They also found that victimization primarily affects low achievers only in rural and suburban schools. This relationship did not hold true in urban schools. This may be one clue as to the somewhat mixed findings of victimization and achievement.

While being victimized at school is generally associated with diminished academic performance in most studies, the association is even more clear and dramatic for bullies. Ma et al. (2009a) found that while victims' academic scores were diminished when matched against comparing students not involved in victimization, the gap between those comparison students and bullies was more than double. They also found that academic performance for bullies trended downward over time. Ma et al. (2009b) replicated the finding that bullies perform more poorly in school than victims. Academic achievement for aggressive students seems to vary with their concurrent level of aggression (Henrich et al. 2004). In a longitudinal study, those who were aggressive in the sixth grade but not in the eighth grade performed better than those who had increased their aggression over the same timeframe. Victim/bullies tend to struggle in their academics even more (Nansel et al. 2001). Fitzpatrick (1999) found that students who said that they could not walk away from a fight were significantly more likely to be victims of violence at school.

The measurement tools used in bullying studies can impact the outcome. Bullying and victimization are generally measured by one or a combination of self-, peer-, and teacher-report. Academic achievement is generally measured by one or a combination of self-report, GPA, or standardized testing. In a meta-analysis of 33

studies, that included 29,552 students, on victimization and achievement Nakamoto and Schwartz (2009) found that studies using GPA showed far greater effects than those using standardized tests. Given an average of less than 1,000 students per study, most of these individual studies were likely not performed across a wide and diverse cross-section of schools. For these primarily within-school studies, GPA showed a much greater effect than standardized testing. This contrasts with the Watkins (2008) study findings that weapons possession, which is highly correlated with either committing or being the victim of bullying and delinquent behavior, is not correlated with GPA. However, the Watkins (2008) study involved over 20,000 students and over 80 high schools and 80 junior high schools. The contrasting findings of these two studies bolsters the author's contention that the fluctuating GPA standards across schools and communities renders it a less appropriate measure of academic performance between schools than standardized testing. GPA is more appropriately understood as a measure of a student's daily adherence to classroom standards and academic performance relative to their within-school peers.

Wienke Totura et al. (2009) designed a study to test potential differences between various measures of bullying and victimization by comparing teacher- and self-reports while evaluating associations with GPA as well as reading and math standardized tests. Within each of teacher-, self-, and concordant reports victim/bullies generally scored the worst in each academic category. Concordant report victim/bullies scored dramatically lower on both reading and math test scores but not GPA. Self-reported victims scored similarly to a comparison group not involved in bullying or victimization in all academic

categories. This is similar to findings elsewhere (Nakamoto and Schwartz 2009). However, victim categories in both teacher-reported and concordant groups showed lower academic achievement in all three academic categories. Bullies scored lower than victims in self- and teacher-reported groups in all three categories. Perhaps the most unexpected finding of the study is that while concordantly rated bullies earned the lowest GPA of any category, they recorded the highest standardized test scores for both reading and math. Concordant bully was a relatively small category (n=17, comparing to n=57 for self-reported bully and n=108 for teacher-reported bully), so it cannot be considered a typical academic pattern for bullies.

This last finding brings to light another interesting contradistinction between standardized tests and GPA. Standardized tests measure knowledge gained up to a given point in time and the ability to retrieve that knowledge. The latter skill calls upon an individual's ability to perform under pressure. GPA is more often a measure of daily effort and cooperation. This is particularly true when considering the modern academic drop in grade standards that has occurred at many schools (Cassidy 2011). Often, K-12 teachers struggle to coax any work at all from a sizable percentage of their students. One may surmise, given the agreement of teacher- and self-reports of bullying, that the concordant bullies are the most open and brazen of bullies. This type of power struggle likely precludes the student from the daily cooperation necessary for a strong GPA, but does not preclude the intelligence and confidence required to perform well on a standardized test. It may even be suggested that this brazen confidence is at the heart of the power struggle.

What has the potential to make violence so impactful upon the academic achievement for a given population of students is that it negatively affects more students than just the victims or the perpetrators. In fact, the correlation of negative academic achievement has been found to be twice as high for witnessing violence at school as for being victimized (Janosz et al. 2008). Those that have witnessed violence tend to conduct themselves more aggressively, which has been validated elsewhere (Schwab-Stone et al. 1995; Flannery, Wester, and Singer 2004). Janosz et al. (2008) also found that second-hand reports of violence from sources considered reliable could impact a student's sense of well-being. Students that reported feelings of insecurity were also associated with low academic performance. Given that there are likely many more witnesses or those that hear about an instance of violence than there are victims of a given incident, this could dramatically multiply the number of students negatively impacted by any single act of violence. While according to this study most often violent incidents occur a few times a year, incidents of verbal abuse are observed by half of students several times a week and 20 percent of students observed their peers threatening others frequently.

Clearly, an atmosphere of violence can seriously impair the academic functioning of a student population. Unfortunately, not enough is known about the differential effects on academic functioning of different specific categories of crime occurring at school.

Academic Achievement and Substance Use

The relationship between substance use in adolescence and academic achievement is not as simple as the generally negative relationship between violence and academic achievement. The results of these studies are mixed and at times contradictory. Involvement with different substances, levels of use, and age of the user all complicate the relationship. Many studies do find that substance use among adolescents negatively impacts academic achievement. Cox et al. (2007) found that frequent smokers were two-and-a-half times and marijuana users twice as likely to have low grades as nonusers when other factors were controlled. They found that binge drinkers were more likely to have low grades, but not at statistically significant levels. Jeynes (2002) did find a significant negative effect on grades for adolescents who had consumed five or more drinks at one sitting, but, like Cox et al. (2007), found a larger effect on grades for daily smokers. Jeynes (2002) did not find a significant effect of marijuana use on grades, likely because the standard used was whether a student had tried it once. Using a 1 to 4 scale of substance use frequency (1 being never and 4 being regularly), Diego, Field, and Sanders (2003) found a significant relationship between low G.P.A. and use of cigarettes, alcohol, marijuana, and cocaine.

However, many studies find no significant effect of substance use on academics, and, in some cases, even a relationship between high academic achievement and substance use. Ludden and Eccles (2007) attempted to better understand different profiles of adolescent substance users. Using K-means clustering to study 733 students, five profiles of substance users emerged: students with high grades but also high risk

factors, such as perception of teacher unfairness or low parental support (n=36); low grades and low risk factors (n=38); students with patterns of school misbehavior (n=30); depressed students (n=37); and students with high grades who are also highly social (n=59). This shows that 47.5 percent of the students categorized as users were students in one of the two high grade categories. Using logistic regression on this same sample group, this study also found that students who were moderate users were more similar in characteristics to non-users than they were to heavy users. They also found that, while good grades did not serve as a predictive factor against becoming a substance user, it did predict against becoming a heavy user. This study demonstrates the complexity of the relationship between substance use in adolescents and academic performance.

Age also plays an important role in the relationship between substance use and achievement. Bryant et al. (2000) found a consistent negative association between cigarette use and grades at each stage when measuring at eighth, tenth, and twelfth grade. Tucker et al. (2008) studied cigarette use over a similar timeframe, measured at ages 13, 16, and 18. They found a significant association at age 13 that was diminished by almost half at 16. It was diminished again by half to non-significance levels by age 18.

The pattern for alcohol consumption is somewhat similar in that the negative association of poor achievement and consumption is clear at earlier ages and less so in late high school. Bryant et al. (2003) found that although students at the age of 14 with high college plans consumed slightly less alcohol than those with low college plans, by the age of 18 they had slightly surpassed their non-college planning counterparts. This occurred on the way to consuming significantly greater quantities by the age of 20.

Crosnoe and Riegle-Crumb (2007) found the negative association to be consistent throughout high school but found that the increase in drinking after high school was almost 20 percent per 0.1 GPA increase during high school. They also found elevated levels of drinking for elite students even when they did not attend college.

Another longitudinal study found a similar timeline of the changing patterns of adolescent substance use and academic achievement as a function of age. This study also attempted to understand which changes in habits tend to precede the other. Owens et al. (2008) found that higher drinking frequency in the ninth grade was negatively associated with tenth grade GPA and ninth grade GPA was negatively associated with tenth grade drinking frequency. This relationship changes somewhat at higher grade levels, however. Although more numerous occasions of drinking in the tenth and eleventh grade were associated with lower GPAs the following school year, higher GPAs in the tenth and the eleventh grades were associated with a greater frequency of drinking in the following school year. They speculate that good grades often lead to a measure of freedom from parents that allows for more drinking opportunities. These studies demonstrate that while alcohol consumption in the early high school years is clearly associated with low academic performance, a more complex relationship exists by the later years.

My study deals with substance possession or use while on campus, which may affect academic performance differently than the more general category of substance use. Eitle and Eitle (2004) found substance related offenses at school were positively associated with dysfunctional school culture as measured by school dropout rate and

percentage of students absent 21 or more days per school year and negatively associated with percent of students who passed the state standardized test. Another study to explore substance use on campus, Jeynes (2002) found that having consumed marijuana or cocaine while at school was more likely to have a negative impact on grades than merely having consumed that substance at some point in their lives. They did not, however, uncover whether having consumed substances on campus had a different relationship with achievement than being a frequent user.

While it is difficult to summarize these findings that are often contradictory, a few patterns emerge. Alcohol consumption, even binge drinking, seems to have the least association with poor grades when compared to cigarettes, marijuana, and cocaine. The association of poor grades and alcohol and cigarette use are consistently negative for the early years of high school, but are less consistent for later high school years and beyond. Finally, substance use at school is negatively associated with academic performance at both the individual and school level.

Conclusions and Hypotheses

Several limitations exist in the literature studying the connection between school delinquency and academic achievement. First, because most victimization at school occurs at the middle and elementary school level, those have been the primary focus of researchers. High schools have been examined to a much lesser degree in this respect. Secondly, the vast majority of studies relating victimization with academic achievement are performed at the level of the individual or the community's effect on the individual. There is a lack of studies dealing with delinquency and achievement as the product of a

common school environment, including the school and its surrounding neighborhood. Third, many studies use survey data, particularly for measures of delinquency. While this is very valuable research, it is also focused on individuals. Other sources of data are needed to obtain a more complete understanding of the phenomenon in question at the community level. Finally, one of the limitations of current literature connecting victimization and achievement is that it uses crime as a broad category of behavior, when it is likely that different crimes show a different relationship with academics. One study that attempts to resolve many of these limitations is Limbos and Casteel (2008). They found an association between crime at the school level, not focused solely on the individual level, and school-wide academic performance. This is one of a handful of studies focusing on high schools. They used school police data and a standardized school measurement and not self-reports. The critical difference between the Limbos and Casteel (2008) study and the current study is that they use crime as a broad category of behavior, while the current study divides school crime by category to find which are the most associated with negative academic outcomes at the school level.

Indicative of the limitations of using broad categories of delinquency, such as suspensions, as a measure of disruption is that the standard of suspension in one school may be very different from that of another. At some schools, teachers and administrators are so overwhelmed by delinquent behavior from students that daily disorder becomes the norm. In such cases only the most serious offenses, such as brawls or gang-style "jumping," are likely to be treated as worthy of suspension. At such a school, cursing at a teacher or even low-level physical contact or intimidation is

likely not to warrant a suspension. At many other schools, such incidents clearly would be deemed worthy of suspension. Other examples of behaviors that become tacitly permissible due to the pressures of the student body's disorderly conduct include persistent disruption, non-physical bullying, or even detection of drug use that is not overtly disruptive. Therefore, a measure of suspensions across schools may be of limited help in providing information about school disruption. Limbos and Casteel (2008) did not find suspension/expulsion rates to be significantly associated with school crime rates.

A second problem with suspensions as a measure of disruption is that it measures as equal infractions those that occur commonly at relatively well functioning schools, such as fighting or smoking cigarettes on campus, with more serious issues, such as ADW or sexual assault. Each of these behaviors would in effect be scored as one suspension to measure disruption, while clearly they are not an equivalent indicator of disorder. For these reasons, a measure of suspensions is not an accurate measure of similar behaviors in between-school comparisons. What is needed is a comparison of equivalent infractions between schools. It is the assumption of this study that the standard of what constitutes a specific crime, such as robbery or battery, is more consistent across schools than what constitutes an offense worthy of suspension. In addition, no study has attempted to deal with the question of what is the measure of school disorder that is most indicative of deterioration in the learning environment.

This study is based on three main hypotheses relating to the relationship between school delinquency and academics. First, of the eight categories of crime included in

this study, significant and negative correlation between that crime and academic performance will be found for all categories except for chemical substance abuse. Second, it follows that since chemical substance abuse produces no meaningful correlation with the academic performance of schools, then a correlation analysis comparing academic performance to the total of school crimes not including chemical substance abuse will have a greater correlation than comparing academic performance to the total of school crime including chemical substance abuse. Third, all measures of non-substance related crime will be highly correlated. Since little literature exists comparing the individual categories of victimization crimes, no hypothesis will be attempted as to which will be most correlated to academic performance or to the other measures of victimization.

This study has four primary hypotheses pertaining to neighborhood demographics and their relationship to local school functioning. First, any significant relationships between the neighborhood characteristic variables in this study and chemical substance abuse will be positive with dimensions indicating high levels of neighborhood affluence, such as high education levels, income, or marriage rates. Second, families below the poverty line and percent of female-headed households will show high levels of positive correlation with school crime and negative correlation with academic achievement. Third, the ratio of married households to female-headed households will display an inverse relationship, showing negative correlations with school crime and positive correlations with academic achievement. This is because this ratio reflects the relative mix of children's family structures within a school. Fourth, while it is difficult to

predict which crime measure will most closely relate to neighborhood demographics due to the dearth of such comparisons in the literature, the intuitive choice would be assault with a deadly weapon, since it is the most serious crime included in this study. The judgment is that the less serious crimes, such as graffiti, will be more evenly distributed while the more serious will be concentrated in socially disorganized neighborhoods. Therefore, this study will tentatively suggest ADW's close association with the demographics variables chosen as an additional hypothesis.

This may seem at odds with the fact that many of the most infamous school shootings, such as Columbine or Sandy Hook, have been committed in middle class neighborhoods by white males. Part of why these incidents came to dominate media coverage for a time is that great carnage appeared to come from out of nowhere in neighborhoods that were otherwise placid. Contrast these media firestorms with the violence occurring between young men in Chicago. This steady flow of tragedy represents a far greater body count, yet has never similarly dominated media coverage. This is likely due to the lack of one dramatic incident or identifiable culprit as well as the sense that the tragedy is contained in poor, minority neighborhoods. Despite the media coverage of school shootings, homicide is a statistically rare occurrence in schools, which is one of the reasons it was not chosen as a variable to include in this study. ADW was chosen partly because it occurs with many times greater frequency than homicide and represents an endemic state in some schools versus homicide which is episodic.

This study has two primary hypotheses pertaining to the multiple regression models. An initial correlation analysis revealed that female-headed household was the

demographic factor most consistently and generally most strongly associated with each of the various crime categories. Based on that observation, it is predicted that female-headed households will be the main variable associated with the more serious school crimes for the multiple regression models as well. Secondly, due to the high association of female-headed households with percent of residents with high school degrees (inverse), percentage of residents with bachelor's degrees (inverse), and poverty (direct) these variables will add little additional explanatory value to neighborhood demographic and school crime models.

CHAPTER 3

METHODOLOGY

Data and Sources

The data obtained included ten different specific categories of crime including ADW, battery, CSA, property crimes, destructive devices, homicide, loiter-trespass, possession of weapons, robbery, and sex offenses. Data are available for these crime categories at the Los Angeles School Police Department (LASPD) website for the school years from 2001-02 through 2006-07. In order to calculate the crime data as a function of student population, enrollment data were obtained from the California Department of Education (CDE) website through its DataQuest service.

The California High School Exit Exam (CAHSEE) was chosen as the measure of academic achievement for several reasons. First, standardized tests, such as the CAHSEE, do not vary in criteria between individual classes or schools as grades do. A second advantage of the CAHSEE score is that it is broken down into subjects, English-Language Arts and Mathematics. Data for the CAHSEE are also available from the CDE website through DataQuest. CAHSEE scores were not available after the school year 2003-04, although the test continues to be in use at the present date. This combined with the availability of the LASPD website information meant that the school years available for study were 2001-02, 2002-03, and 2003-04.

For the study of neighborhood demographics, census data from the year 2000 were chosen since they were closer in time to the school measures than the more recently available 2010 census information. Census Fact Finder was used by zip code in the following categories as presented by the website: percentage of home ownership, percentage of high school graduates in the population 25 years and older, percentage of college graduates in the population 25 years and older, median family income, and percentage of families below the poverty line.

The following variables were calculated using data from Census Fact Finder: percentage of married households with children, percentage of female-headed households with children, and the ratio of married households with children to female-headed households with children. Percentage of married households with children was calculated as a fraction of married households with children over the total number of households in the zip code. Similarly, percentage of female-headed households with children was calculated as a fraction of female-headed households with children over the total number of households in the zip code.

The ratio of married households with children to female-headed households with children is a variable that is not seen often in studies, but may be critical to understanding the dynamics of a neighborhood and school culture. This ratio provides insight into how many children, in a neighborhood or the nearby school, are coming from female-headed households and how many are coming from married households. This is perhaps the most relevant family structure variable because the other two are measured

against total number of households in a zip code, which may be overwhelmingly single people that do not affect the characteristics of children in the local population.

Analyses

Correlation analysis was chosen to better identify co-occurring factors. This is instructive alone, but also informs further hypotheses of multiple regressions that were also included in the analysis. The correlation analysis was performed using the SPSS Standard GradPack 19. The following crime categories were statistically compared: ADW, battery, CSA, property crimes, loiter-trespass, possession of weapons, robbery, and sex offenses. Each of the categories of crime except for destructive devices and homicide were compared individually to the measures of academic performance and neighborhood demographics. The categories of homicide and destructive devices were excluded because their infrequent occurrence would have yielded no meaningful trends. The vast majority of schools incurred no such incidents. However, both categories were included in the calculation of total school crime and total school crime no CSA. Total school crime included all categories of crime, whereas total school crime no CSA included all crime except for CSA. Each category of crime was calculated as incidents per 1000 students each year. That total was averaged for the three school years included in the study. Three-year averages of both English-Language Arts and Mathematics CAHSEE were included in the analysis as the measurements of academic achievement.

Additionally, in order to find models predictive of school conditions, a series of multiple regression analyses were performed. This technique would enable a distinction between which variables added predictive value to the model and which were redundant

due to multicollinearity. The multiple regressions were performed as follows. First, all of the individual school delinquency measures were included as independent variables for both the math and English CAHSEE scores serving as dependent variables. Next, all the neighborhood variables were used as independent variables for each of the math and English CAHSEE scores, the individual delinquency measures, the total school crime measure, and total school crime no CSA all serving as separate dependent variables. All regressions were performed both stepwise and backward to see if the final models converged or diverged. It should be noted that stepwise regression can introduce a level of experimentwise error. Therefore, the results of such analyses may be considered somewhat less definitive than other regression methods. The default inclusion and exclusion settings were used for both methods, p=0.05 and p=0.10, respectively.

Criteria for Inclusion of Schools

Only large high schools were included in the analyses for several reasons. For the analyses performed before the outlier was removed, n=45. For the no outlier and regression analyses n=44, with one outlier removed. Small and large schools systematically differ in their ability to manage delinquency. Small schools often operate as charter schools that are not bound by the same rules as those attended by a majority of LAUSD students. This may mean a different set of policies pertaining to reporting criminal incidents to the LASPD. Finally, many small schools select their students by application, making them different from the larger schools that must accept a wider cross section of students. One large high school, Jefferson High School in Los Angeles, was excluded because it had been reconstituted, making the data unavailable. Initial

correlation analyses revealed one outlier, Kennedy High School in Granada Hills. Given the large number of variables involved, a greater sample size would have been better suited to detecting small effects (Chang 2013). However, the final sample size should be adequate to detect large ones. The correlations are shown both with and without the outlier, but the multiple regressions are performed only without.

Assumptions of Correlation and Regression: Level of Measurement, Normalcy, Linearity, and Homoscedasticity

Most of the data used in this study were ratio data for which it was possible, though generally unlikely, to score a zero. The only exceptions were the CAHSEE tests, which were interval data with a lowest score of 275. While the mean over median ratio for the neighborhood academic variables were generally close to one, the ratio for the delinquency variables tended to be greater than one and, in many cases, markedly so. The mean over median ratio for the Math CAHSEE was 1.000 and for the English CAHSEE was 0.999. Of the neighborhood measures, none of the ratios differed from 1.0 by more than 0.1. For the delinquency measures the ratio for robbery was by far the greatest at 2.271. The crimes without specific victims had ratios close to 1 - CSA (1.122), property (1.037), and weapons (1.088). The crimes with a specific victim and loitering all had larger mean over median ratios – ADW (1.337), battery (1.366), loitering (1.665), and sex offenses (1.380). However, the ratio for total (1.087) and total no CSA (1.110) remained fairly close to one. In general, the associations among the X and Y variables included in this study were linear in shape and quite homoscedastic, as demonstrated by the scatterplots below. A greater mean than median for the individual

school crimes is consistent with a few points, at higher crime levels, having larger variability above the trendline.

Creation of the Maps

This study includes five maps created from Tiger Census Data using ArcGIS 10.1 software. Figure 1 shows all 45 of the large high schools in LAUSD, except for Jefferson High School for which data were not available. The zip codes where these high schools are located are also shown as well as the full extent of LAUSD. In this map the high schools are labeled. A map inset is included to show the location of LAUSD within California. Figure 2 shows the large high schools in LAUSD and all of the zip codes that touch the LAUSD polygon. Labels are included for the zip codes where large LAUSD high schools are located and several of the cities. Figures 11, 13 and 14 were all created using natural breaks method with four levels for each variable included. Each of these displays a choropleth map of the percent single parent in each zip code that contains a large LAUSD high school. Each of these maps also displays a proportional symbol for the high schools to show its level of the respective variable. For Figure 11 the proportional symbols show the level of three year school averages for Math CAHSEE test scores. Since the r-values for the math and English CAHSEE exams were close to 1 ($r = 0.927$, $p = 0.000$), with the effects for math with the crime measures being slightly larger, it seemed reasonable to use the math score only to demonstrate the geographical relationships. The proportional symbols in Figure 13 show the incidents of school crime per 1000 students calculated as a three school year

average from 2001 to 2004. Similarly, the symbols in Figure 14 show the incidents of CSA per 1000 students calculated as a three school year average from 2001 to 2004.

CHAPTER 4

RESULTS

The results section will begin with a discussion of the effect of the outlier school on the data. This will be followed by an explanation of the relationships revealed by the simple regressions in the following order: academic scores and school crime, relationships between school crime categories, academic scores and neighborhood demographics, and school crime and neighborhood demographics. Next will be examinations of the multiple regressions performed in this study. The final section will be an examination of how accurately the hypotheses of this study predicted the statistical outcomes.

Outlier Effect

To the extent that removal of the outlier, Kennedy High School, had an effect, it tended to intensify relationships rather than diminish them (see Tables 1 and 2 for comparison). Of the relationships between academic scores and crime categories the most dramatically impacted were property crimes, weapons possession, sex offenses, and both cumulative crime scores. Similar intensification occurred with the relationships of these same crime categories and demographic categories, which tended to move these associations to significance levels. One exception to the tendency towards effect intensification was the relationship between CSA and the marriage ratio moving from

TABLE 1. Partial Correlation Matrix with Outlier Removed

	English		Math		ADW		Battery		CSA		Property	
	r	p	r	p	r	p	r	p	r	p	r	p
Mar/Fem	0.601**	0.000	0.680**	0.000	-0.468**	0.001	-0.482**	0.001	0.118	0.440	-0.304*	0.042
Fem/HH	-0.743**	0.000	-0.745**	0.000	0.482**	0.001	0.465**	0.001	0.114	0.457	0.372*	0.012
Mar/HH	-0.289	0.054	-0.186	0.222	-0.082	0.594	-0.132	0.388	0.306*	0.041	0.141	0.355
% < Pov	-0.746**	0.000	-0.712**	0,000	0.473**	0.001	0.260	0.084	-0.021	0.890	0.363*	0.014
Med Inc	0.686**	0.000	0.654**	0.000	-0.336*	0.024	-0.150	0.327	-0.049	0.751	-0.298*	0.047
% BA	0.677**	0.000	0.638**	0.000	-0.243	0.108	-0.156	0.308	-0.232	0.125	-0.316*	0.034
% HS	0.692**	0.000	0.611**	0.000	-0.238	0.115	-0.056	0.716	-0.155	0.309	-0.323*	0.030
Owner	0.214	0.157	0.206	0.175	-0.152	0.317	0.004	0.978	0.170	0.264	-0.105	0.491
No CSA	-0.607**	0.000	-0.673**	0.000	0.803**	0.000	0.782**	0.000	0.291	0.052	0.857**	0.000
Total	-0.598**	0.000	-0.639**	0.000	0.778**	0.000	0.784**	0.000	0.461**	0.001	0.836**	0.000
Sex Off	-0.411**	0.005	-0.479**	0.001	0.596**	0.000	0.629**	0.000	0.011	0.941	0.399**	0.007
Robbery	-0.490**	0.001	-0.551**	0.000	0.862**	0.000	0.827**	0.000	0.098	0.522	0.458**	0.002
Weapon	-0.509**	0.000	-0.404**	0.006	0.589**	0.000	0.644**	0.000	0.562**	0.000	0.379*	0.010
Loiter	-0.455**	0.002	-0.502**	0.000	0.573**	0.000	0.635**	0.000	0.205	0.177	0.313*	0.037
Property	-0.493**	0.001	-0.565**	0.000	0.506**	0.000	0.413**	0.005	0.215	0.157		
CSA	-0.183	0.230	-0.079	0.604	0.173	0.256	0.311*	0.038				
Battery	-0.406**	0.006	-0.478**	0.001	0.759**	0.000						
ADW	-0.527**	0.000	-0.553**	0.000								
Math	-0.927**	0.000										

TABLE 1. Continued

No CSA		Total		Sex Off		Robbery		Weapon		Loiter	
r	p	r	p	r	p	r	p	r	p	r	p
-0.483**	0.001	-0.425**	0.004	-0.460**	0.001	-0.478**	0.001	-0.289	0.054	-0.437**	0.003
0.533**	0.000	0.516**	0.000	0.405**	0.006	0.520**	0.000	0.342*	0.021	0.453**	0.002
0.019	0.899	0.077	0.617	-0.136	0.372	-0.124	0.416	0.012	0.939	-0.061	0.689
0.444**	0.002	0.408**	0.005	0.314*	0.036	0.379*	0.010	0.213	0.159	0.386**	0.009
-0.330*	0.027	-0.315*	0.035	-0.267	0.077	-0.179	0.239	-0.213	0.160	-0.309*	0.039
-0.325*	0.029	-0.346*	0.020	-0.203	0.181	-0.163	0.285	-0.244	0.106	-0.263	0.081
-0.290	0.054	-0.298*	0.047	-0.126	0.410	-0.120	0.434	-0.158	0.301	-0.232	0.126
-0.088	0.566	-0.049	0.749	-0.077	0.617	0.012	0.938	0.033	0.831	-0.117	0.443
		0.983**	0.000	0.578**	0.000	0.799**	0.000	0.648**	0.000	0.645**	0.000
				0.538**	0.000	0.760**	0.000	0.708**	0.000	0.638**	0.000
						0.591**	0.000	0.345*	0.020	0.224	0.139
								0.534**	0.000	0.592**	0.000
										0.529**	0.000

** indicates significance levels of 0.01.   * indicates significance levels of 0.05.

TABLE 2. Partial Correlation Matrix with Outlier Included

Property		CSA		Battery		ADW		Math		English		
r	p	r	p	r	p	r	p	r	p	r	p	
-0.040	0.791	0.312*	0.035	-0.347*	0.018	-0.412**	0.004	0.667**	0.000	0.589*	0.000	Mar/Fem
0.205	0.171	-0.043	0.775	0.399**	0.006	0.460**	0.001	-0.745**	0.000	-0.742*	0.000	Fem/HH
0.151	0.318	0.236	0.114	-0.106	0.482	-0.074	0.623	-0.180	0.230	-0.285	0.055	Mar/HH
0.156	0.300	-0.174	0.247	0.183	0.223	0.440**	0.002	-0.709**	0.000	-0.741*	0.000	% < Pov
-0.074	0.626	0.171	0.257	-0.064	0.672	-0.298*	0.044	0.649**	0.000	0.677*	0.000	Med Inc
-0.168	0.264	-0.036	0.812	-0.109	0.471	-0.226	0.131	0.640**	0.000	0.678*	0.000	% BA
-0.141	0.350	0.050	0.740	0.001	0.996	-0.215	0.152	0.612**	0.000	0.690*	0.000	% HS
0.093	0.537	0.323*	0.029	0.088	0.563	-0.117	0.440	0.216	0.149	0.221	0.139	Owner
0.898**	0.000	0.569**	0.000	0.791**	0.000	0.733**	0.000	-0.535**	0.000	-0.485*	0.001	No CSA
0.900**	0.000	0.723**	0.000	0.766**	0.000	0.662**	0.000	-0.448**	0.002	-0.424*	0.003	Total
0.598**	0.000	0.438**	0.002	0.666**	0.000	0.553**	0.000	-0.365*	0.013	-0.314*	0.034	Sex Off
0.341*	0.020	0.033	0.825	0.779**	0.000	0.854**	0.000	-0.552**	0.000	-0.491	0.001	Robbery
0.539**	0.000	0.655**	0.000	0.683**	0.000	0.571**	0.000	-0.333*	0.024	-0.432*	0.003	Weapon
0.410**	0.005	0.343*	0.020	0.665**	0.000	0.576**	0.000	-0.461**	0.001	-0.420*	0.004	Loiter
		0.592**	0.000	0.494**	0.000	0.460**	0.001	-0.403**	0.005	-0.353*	0.016	Property
				0.416**	0.004	0.186	0.217	0.006	0.969	-0.065	0.669	CSA
						0.752**	0.000	-0.436**	0.002	-0.370*	0.011	Battery
								-0.542**	0.000	-0.518*	0.000	ADW
										0.927*	0.000	Math

TABLE 2. Continued

No CSA r	No CSA p	Total r	Total p	Sex Off r	Sex Off p	Robbery r	Robbery p	Weapon r	Weapon p	Loiter r	Loiter p
-0.229	0.126	-0.116	0.441	-0.201	0.180	-0.464**	0.001	-0.112	0.457	-0.313*	0.034
0.375*	0.010	0.305*	0.039	0.261	0.080	0.519**	0.000	0.243	0.104	0.391**	0.007
0.050	0.739	0.100	0.508	-0.079	0.600	-0.126	0.404	0.039	0.798	-0.041	0.789
0.263	0.077	0.179	0.235	0.148	0.326	0.377**	0.010	0.099	0.514	0.305*	0.039
0.140	0.353	-0.076	0.615	-0.081	0.592	-0.181	0.228	-0.075	0.618	-0.217	0.148
-0.206	0.169	-0.182	0.226	-0.099	0.512	-0.165	0.272	-0.161	0.287	-0.214	0.154
-0.148	0.326	-0.112	0.458	-0.007	0.963	-0.123	0.414	-0.061	0.689	-0.168	0.263
0.077	0.612	0.143	0.342	0.091	0.547	0.002	0.987	0.152	0.313	-0.029	0.849
		0.980**	0.000	0.698**	0.000	0.662**	0.000	0.726**	0.000	0.675**	0.000
				0.694**	0.000	0.564**	0.000	0.770**	0.000	0.651**	0.000
						0.478**	0.001	0.499**	0.000	0.334*	0.024
								0.465**	0.001	0.559**	0.000
										0.580**	0.000

** indicates significance levels of 0.01. * indicates significance levels of 0.05.

significance with the outlier and non-significance without. ADW, battery, and robbery showed only minor shifts except for the relationship of battery and the marriage ratio (from r=-0.347, p=0.018 to r=-0.482, p=0.001). The text below examines the correlation matrix without the outlier because it provides a more vivid illustration of the interaction of factors that occur at all the schools in the study, but Kennedy High School. This decision will be further examined in the discussion section.

Academic Scores and School Crime

All relationships of academic scores and school crimes were in the anticipated directions for both math and English. No relationship was found between school scores and incidents of CSA. This is to be expected given the inconsistent findings of previous research on the relationship of achievement and substance use in adolescents. Significance levels were achieved in the negative direction for academic achievement and all individual non-CSA crime measures and both cumulative crime categories. For the comparison of the effect of total crime versus that of total crime no CSA, the r score was not significantly greater for total crime no CSA on both English scores (r=-0.607 vs. r=-0.598, z = 0.06, two-tailed P=0.9522) and math scores (r=-0.673 vs. r=-0.639, z=0.27, two-tailed P=0.7872).

The scatterplot for math and total no CSA is typical of the homoscedasticity of the academic scores and school delinquency measures (Figure 3). There is a moderate tightness of points around the trendline without any dramatic deviation through most of it, except for the outlier Kennedy High School (Figure 4). The other scatterplots are shown without the outlier. It is also typical of the school delinquency measures that one

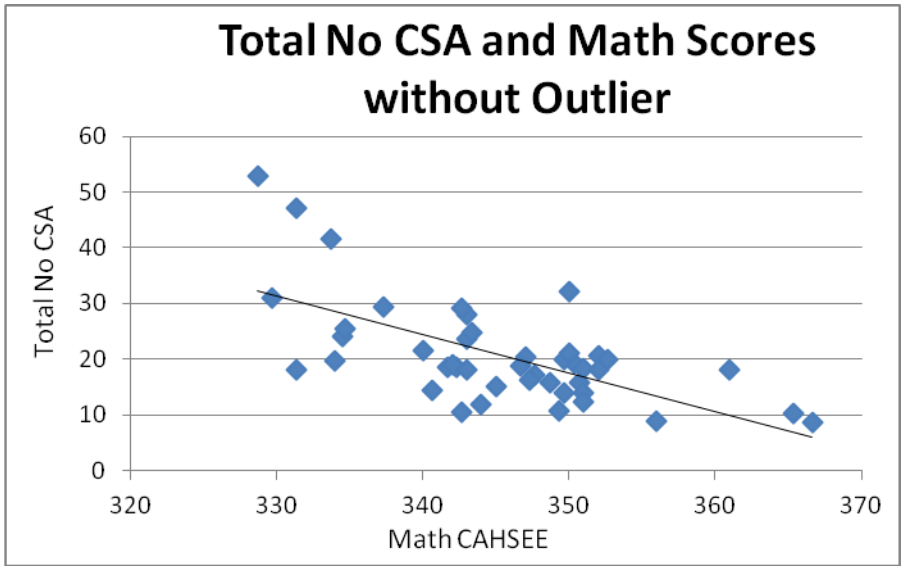

FIGURE 3. Scatterplot of math CAHSEE and total no CSA without the outlier.

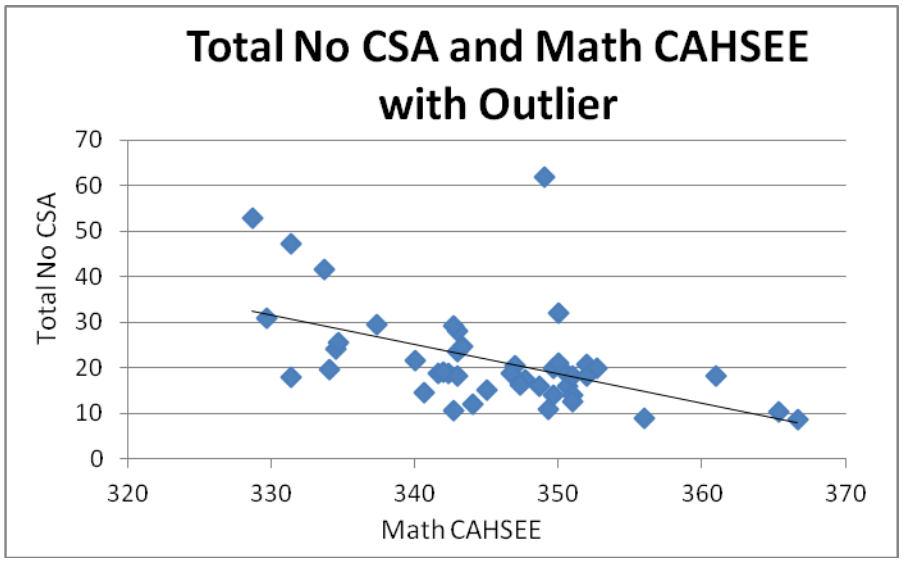

FIGURE 4. Scatterplot of math CAHSEE and total no CSA with the outlier.

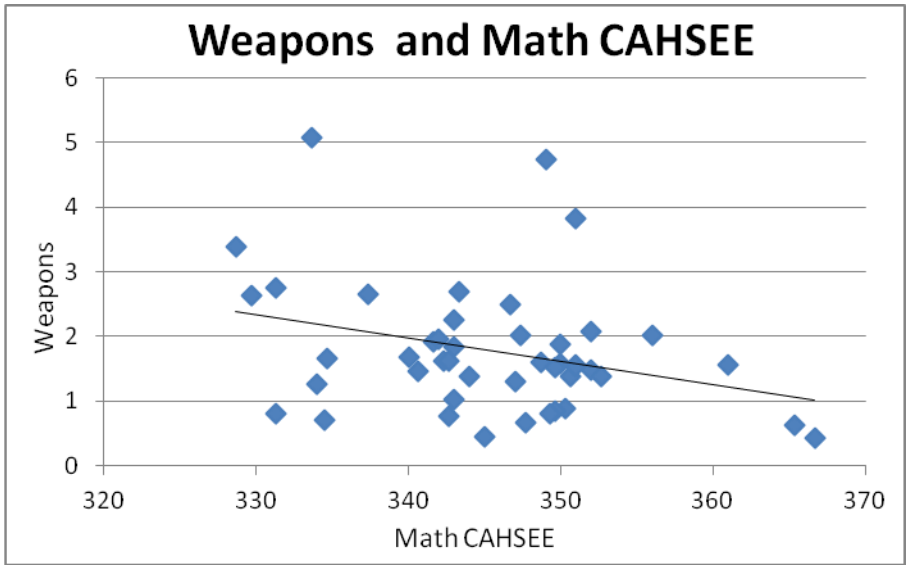

FIGURE 5. Scatterplot of math CAHSEE and weapons crimes.

to three points are noticeably higher on the high end of the crime side and the low end of the academic side. This is true of the scatterplots for ADW, robbery, property crimes, sex offenses, and loiter-trespass. This is consistent with a greater mean than median for school crimes. One exception to that pattern was the scatterplot between the Math CAHSEE and weapons crime (Figure 5). In this case the scatterplot was less tight to the trendline. This may indicate that weapons possession problems can occur at schools whose academics are reasonably well functioning or that there is some discretion in administrative decisions to prosecute.

Relationships Among School Crime Categories

CSA was the only individual crime category to not achieve significance for total crime no CSA, though the association was in the positive direction ($r=0.291$, $p=0.052$). Despite being the second highest frequency crime within a school on average, it was the

least associated with total crime including CSA. A closer look at the relationships with the individual crime categories reveals that CSA was only significant with battery (r=0.311, p=0.038) and weapons possession (r=0.562, p=0.000). The scatterplot of CSA and weapons possession (Figure 6) is uncharacteristic of the majority of individual crime category plots in that there is a relatively balanced amount of dots throughout the length of the trendline. More characteristic is the scatterplot of sex offenses and battery (Figure 7) in which, at lower values, there is a tight ball representing the majority of points. At the greater half of the trendline, there are less than ten points, often with more pronounced variance.

All but one of the individual non-CSA school crime relationships were correlated with each other as hypothesized. Only the relationship between sex offenses and loiter-trespass was found to be non-significant (r=0.224, p=.139). The strongest relationships were found between robbery and ADW (r=0.862, p=0.000), robbery and battery (r=0.827,

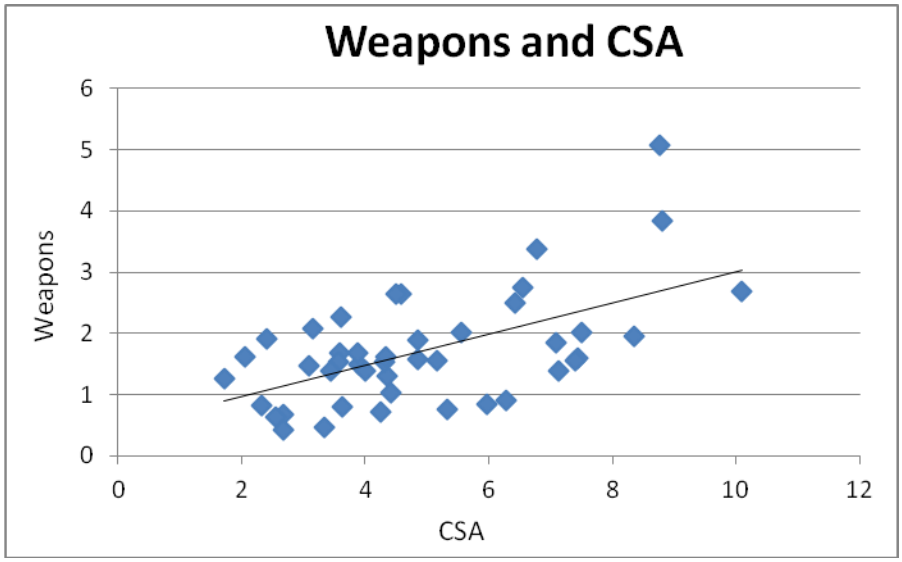

FIGURE 6. Scatterplot of weapons and CSA.

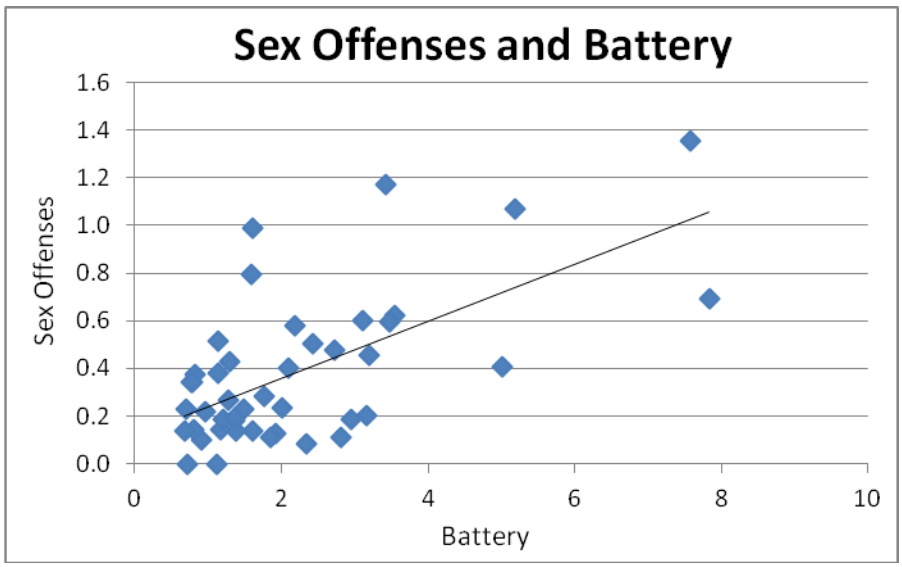

FIGURE 7. Scatterplot of sex offenses and battery.

p=0.000), and battery and ADW (r=0.759, p=0.000). Each of these three crimes has in common a specific victim, unlike an act of vandalism or substance use crime, and is much more likely to occur between males

These scatterplots were characterized by one or two points significantly higher than the rest, like that of robbery and battery (Figure 8). In particular, Jordan High School registered the highest totals for robbery by over double the next (9.21 to 4.49), ADW by almost double the next (4.33 to 2.30), and the second highest totals for battery. It should also be noted that the next highest correlation, weapons and battery (r=0.644, p=0.000), represents a relatively sharp drop in association strength. The relationships between all pairs of the three crimes of the highly correlated cluster tended to be moderately high with loiter-trespass, weapons possession, and sex offenses; moderately associated with property crimes; and only battery was even slightly associated with CSA.

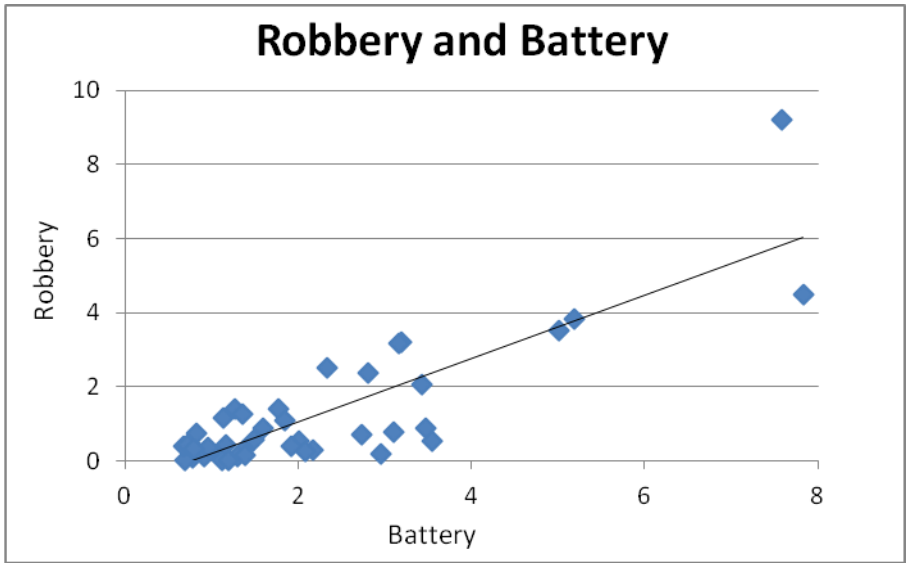

FIGURE 8. Scatterplot of robbery and battery.

This cluster also represented the second, third, and fourth highest associations with both cumulative crime categories. The highest association with the cumulative categories was property crimes (r=0.836, p=0.000 with total crime and r=0.857, p=0.000 with total no CSA), likely because it represented about half the crimes reported within the total crime category and an even greater proportion of the total no CSA category. In fact, property crimes had a generally low relationship with each individual category of crime. Other than CSA, sex offenses were the least associated with the cumulative categories (r=0.538, p=0.000 with total crime and r=0.578, p=0.000 with total no CSA).

Academic Scores and Neighborhood Demographics

Academic scores were found to be highly correlated with most of the demographic measures. Percentage of high school graduates, percentage of college graduates, and median family income all registered r-scores between 0.6 and 0.7 for

TABLE 3. Correlation Matrix of Demographic Factors

%HS	0.285						
College	0.064	0.912**					
Med Inc	0.656**	0.770**	0.737**				
% < Pov	-0.542**	-0.809**	-0.714*	-0.855**			
Mar/HH	0.248	-0.752**	-0.730**	-0.252	0.310*		
Fem/HH	-0.120	-0.755**	-0.818**	-0.655**	0.812**	0.451**	
Mar/Fem	0.542**	0.334*	0.395**	0.701**	-0.680**	0.237	-0.685**
	Owner	% HS	% College	Med Inc	% < Pov	Mar/HH	Fem/HH

** indicates significance levels of 0.01. * indicates significance levels of 0.05.

relationships with both English and math scores. These demographic factors were themselves highly correlated with a 0.912 (p=0.000) correlation for high school and college graduates and r-scores of 0.770 (p=0.000) and 0.737 (p=0.000) for median family income and percentage of high school and college graduates, respectively (Table 3). Percentage of families below the poverty line was highly correlated in the negative direction with English and math scores (r=-0.746, p=0.000 and r=-0.712, p=0.000), as has been repeatedly found in the studies discussed in the literature review. These scores were similar in extent, though inverse, to those of median family income which was correlated positively with English and math scores (r=0.686, p=0.000 and r=0.654, p=0.000). Home ownership was correlated in the positive direction with both math and English scores though it did not reach significance. This is the case in many other studies testing residential mobility.

Neighborhood family structure also showed strong relationships with academic scores (Figure 11). Percentage of female-headed households with children was highly and inversely correlated with both math scores (r= -0.745, p=0.000) and English scores (r= -0.743, p=0.000). The scatterplots of the relationships of female-headed households

with math and English (Figures 9 and 10, respectively) show relatively even distribution and tightness of variance.

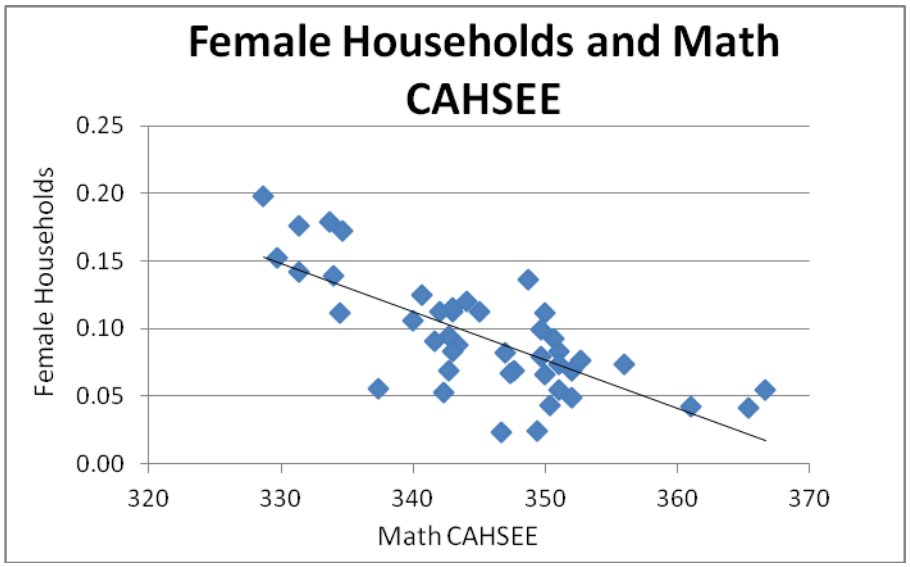

FIGURE 9. Scatterplot of female households and math CAHSEE.

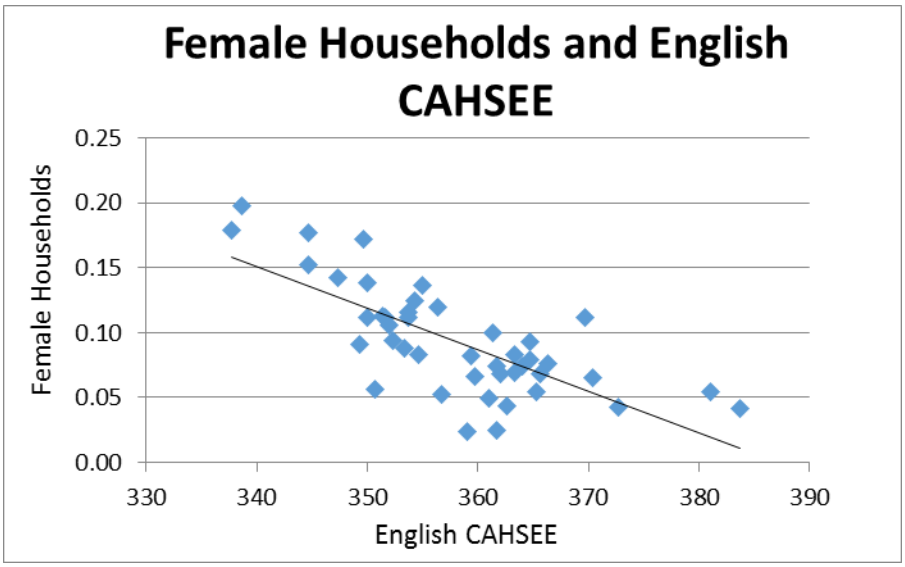

FIGURE 10. Scatterplot of female households and English CAHSEE.

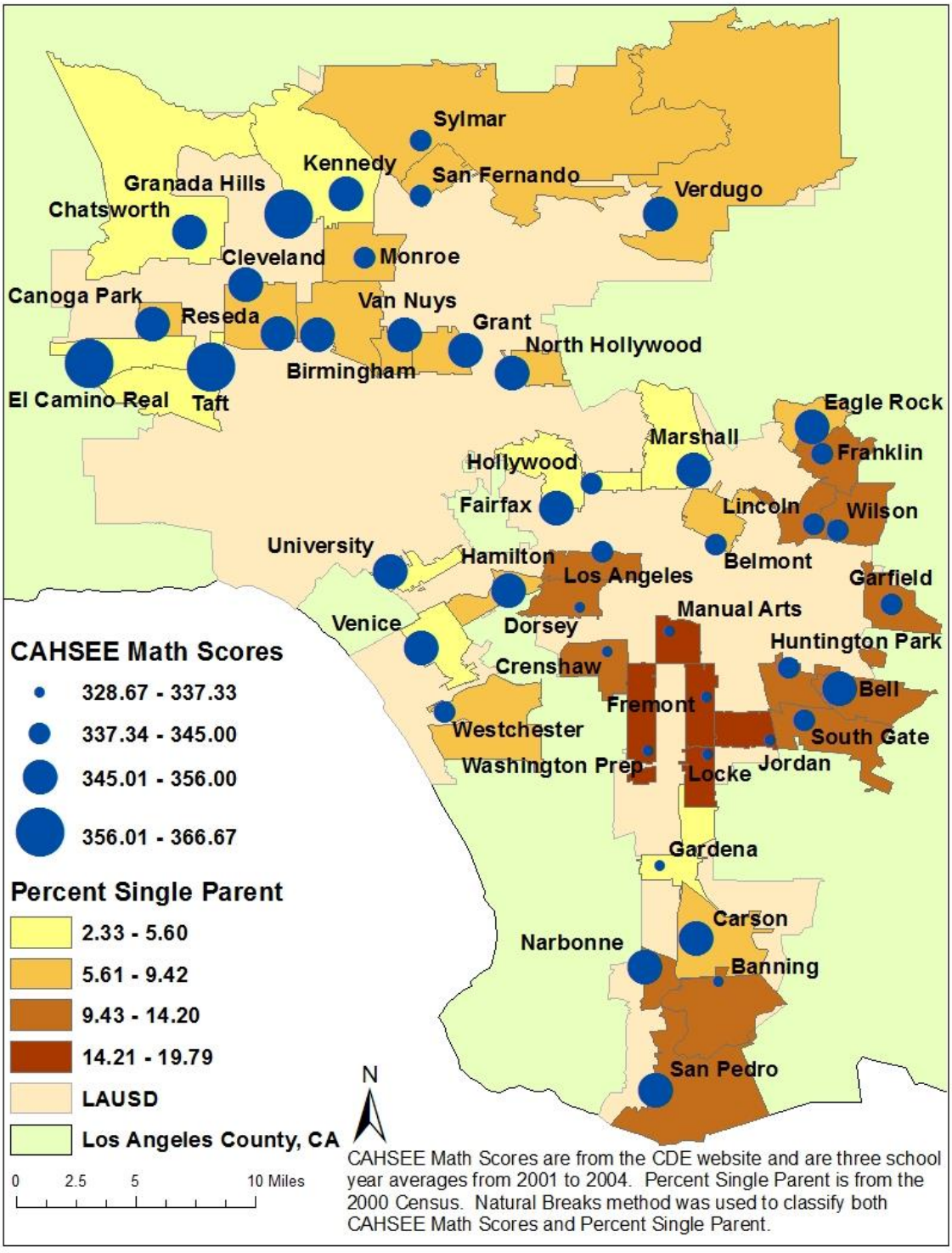

FIGURE 11. Relationship of math achievement and single-parent households.

The ratio of married households with children vs. female-headed households with children had the opposite and nearly as strong a relationship on both English scores (r=0.601) and math scores (r=0.680). The percentage of married households per total number of households, was unexpectedly in the negative direction for math (r=-0.186, p=0.222) and English (r= -0.289, p=0.054), though neither achieved significance.

School Crime and Neighborhood Demographics

The category of owner occupied households was non-significant for every individual and cumulative delinquency measure. Both percentage of high school graduates and college graduates were inversely related only to property crimes (r=-0.323, p=0.030 and r=-0.316, 0.034, respectively) and total crime (r=-0.298, p=0.047 and r=-0.346, p=0.020, respectively). Percentage of college graduates was inversely related to total crime no CSA (r= -0.325, p=0.029), and percentage of high school graduates was in the negative direction but did not achieve significance (r= -0.290, p=0.054). Being related measures, it should be unsurprising that median family income and percentage of families below the poverty line behaved somewhat as mirror images, though the effect of poverty was generally larger. Both were non-significant for battery, CSA, and weapons possession. Both were significant for ADW, property crimes, loiter-trespass, total crime, and total crime no CSA. Sex offenses were significant for poverty (r=0.314, p=0.036) but not for income (r=-0.267, p=0.077), though the absolute value difference in effect size was minimal (0.037). Robbery was significant for poverty but not for income (r=0.379, p=0.010 and r=-0.179, p=0.239, respectively).

For the measures of family structure, the percentage of married households with children was correlated with only one category of crime. It was positively associated with CSA (r=0.306, p=0.041). The percentage of female-headed households with children and the ratio of married households to female-headed households with children were also near statistical mirror images, with the former being associated positively with delinquency and the marriage ratio associated negatively. For both, total crime no CSA measured a higher r-score than any individual crime category (r=-0.533, p=0.000 for female-headed household and r=-0.483, p=0.001 for the marriage ratio). These two family structure variables presented a noteworthy clustering between the individual crime variables. Essentially, the correlations split the crimes into a lesser association with crimes involving a nonspecific victim such as CSA, property crime, and weapons possession and a greater association with crimes involving a specific victim – ADW, robbery, battery, and sex offenses - plus loiter-trespass. Of the nonspecific victim crimes CSA was non-significant for both (r=-0.118, p=0.440 for female-headed household and r=0.114, p=0.457 for the marriage ratio), property crime was significant for both (r=0.372, p=0.012 for female-headed household and r=-0.304, p=0.042 for the marriage ratio), while weapons possession was significant for female-headed households and nearly so for the marriage ratio (r=-0.342, p=0.021 for female-headed household and r=-0.289, p=0.054 for the marriage ratio). However, none of these significance levels were greater than an absolute value r-score of 0.372 or were significant at alpha levels of 0.01. This contrasts with the other five crime categories, which were all significant at alpha levels of 0.01 and none were below absolute value r-scores of 0.405. Figure 12

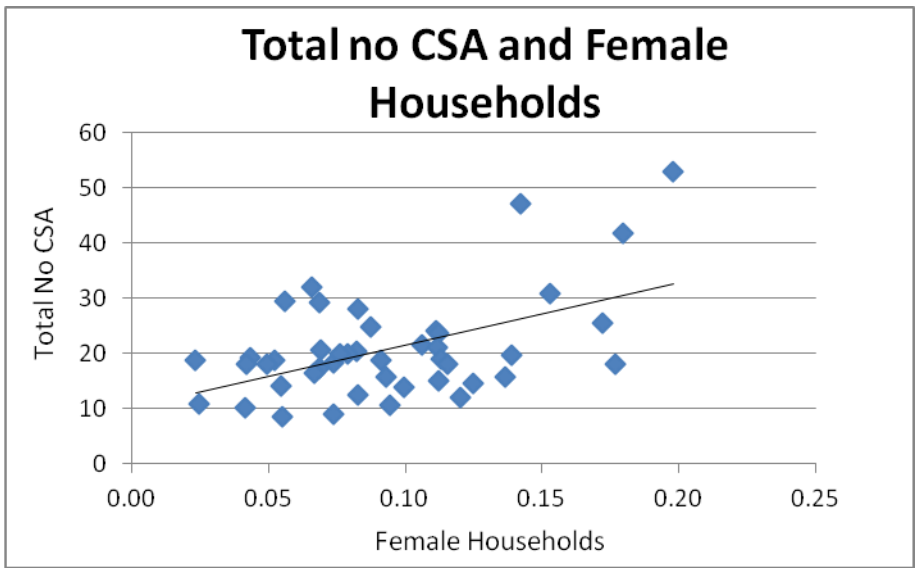

FIGURE 12. Scatterplot of total no CSA and percentage of female households.

shows the scatterplot of total crime no CSA and female-headed households. The highest three values of total crime no CSA are significantly greater than the others and their variance from the trendline is also greater than most of the points.

Figure 13 shows the geographical relationship between school crime and single-parent households. Of the four highest crime schools, three are located in a cluster in Los Angeles that is also where the four zip codes of the highest percentage of single-parent households are located. This contrasts with the northwestern section of the map, from Marshall and Venice to the west part of the Valley, in which nine of the ten lowest percent single-parent zip codes are located and none are above the second lowest category. In that same area are seven of the eleven lowest crime schools and only the outlier, Kennedy, is above the second lowest crime category. Figure 14 demonstrates that a similar relationship between CSA and single-parent households does not exist.

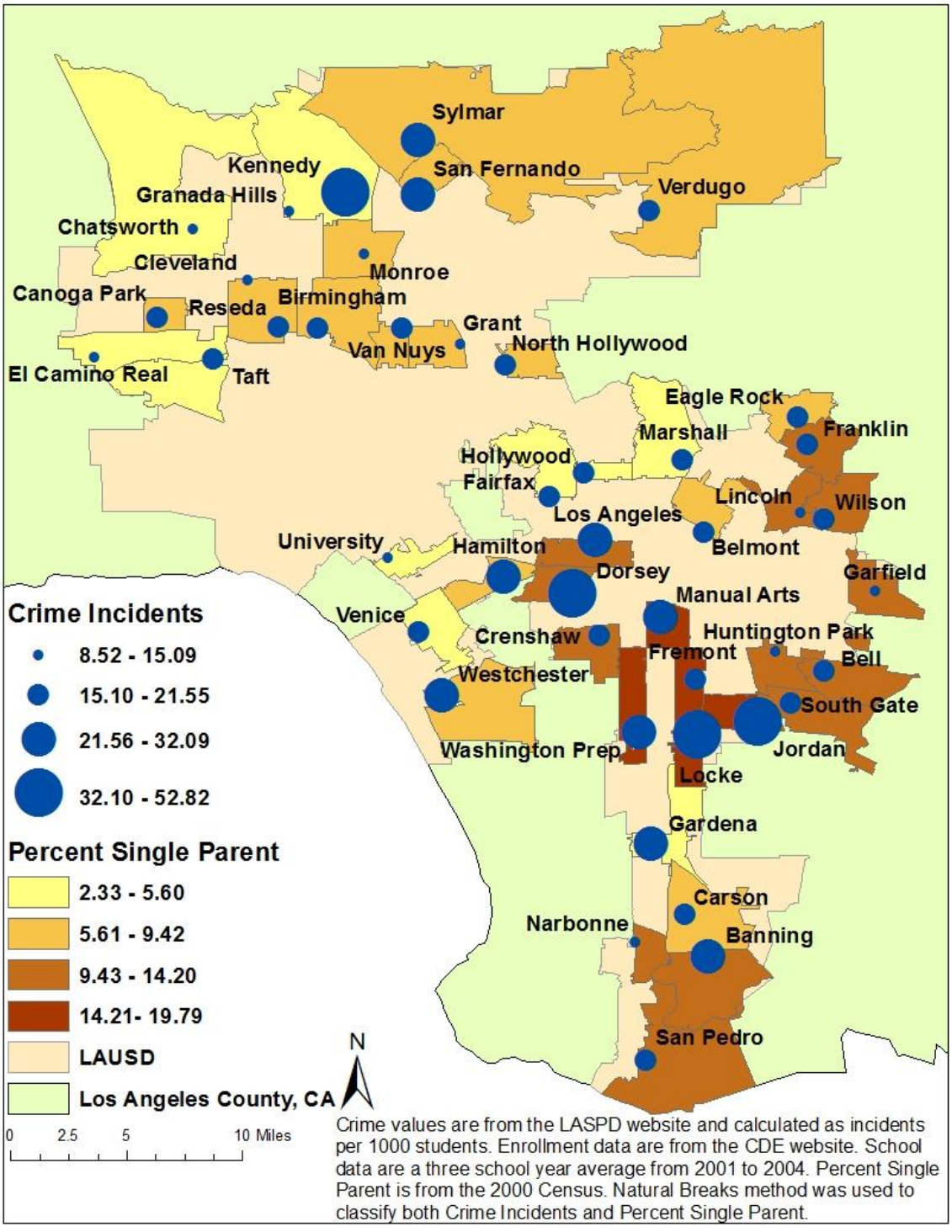

FIGURE 13. Relationship of school crime and single-parent households.

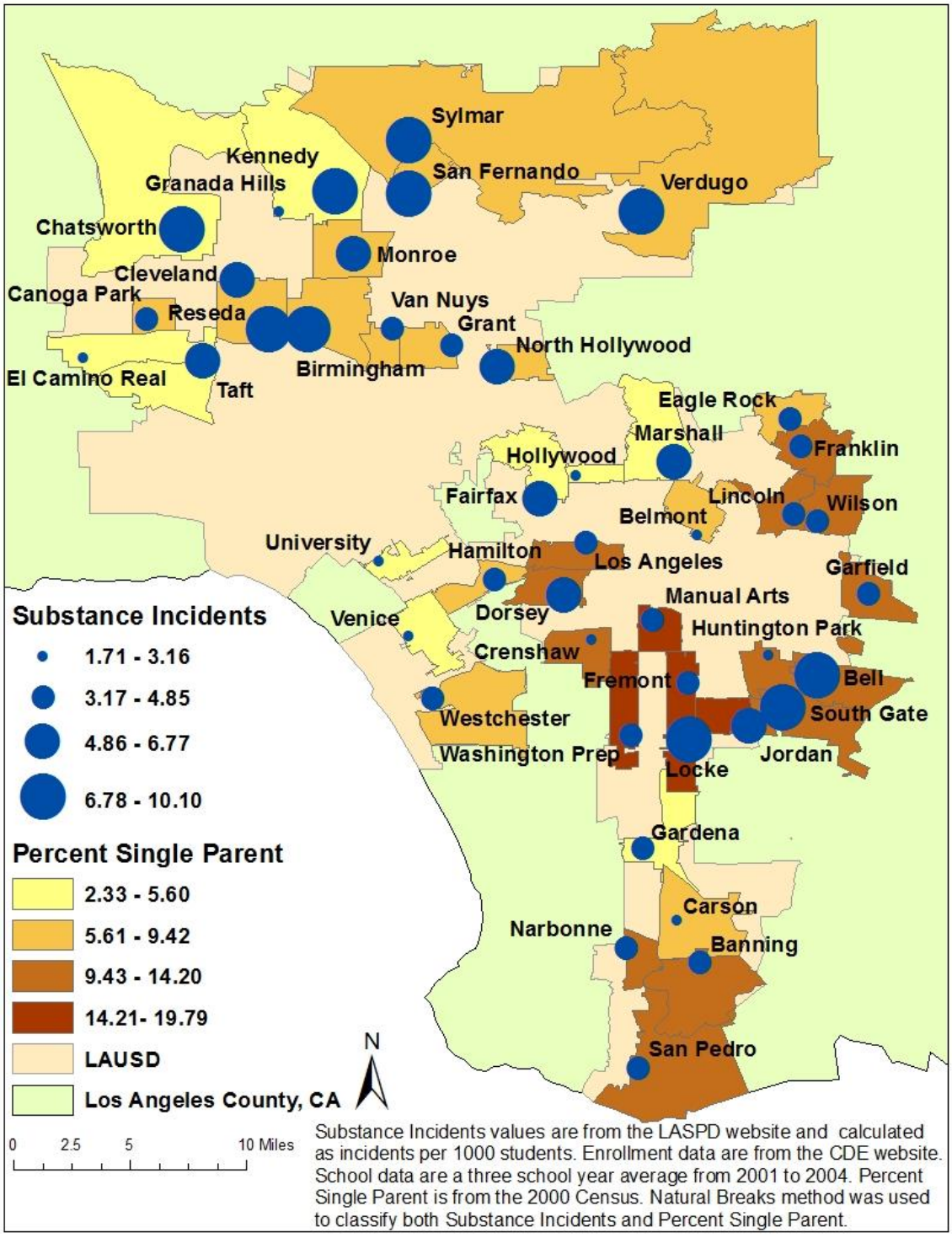

FIGURE 14. Relationship of substance related crimes and single-parent households.

Although it bears no relationship to any apparent underlying neighborhood characteristics, a geographical pattern emerges with higher substance prosecutions occurring in the San Fernando Valley, in which the zip codes are in the lowest and second lowest levels of percent single-parent, and from South Los Angeles to the City of Bell, in which the zip codes are the highest and second highest levels of percent single-parent. In Figure 13 the primary focal point of crime in LAUSD is around central Los Angeles including three highest level crime schools: Jordan, Locke and Dorsey; six second level crime schools: Gardena, Washington Prep, Westchester, Hamilton, Los Angeles, and Manual Arts; just two schools in the third highest crime level: Crenshaw and Fremont; and none in the lowest level. When comparing these same schools in the Figure 14 map about substance incidents, there is just one in the highest category and just one in the second highest category. The differences between Figures 13 and 14 demonstrate visually what is made clear by the data provided by this study; the pattern of substance prosecutions in schools does not generally correspond to overall levels of criminal prosecutions.

Regressions

The stepwise and backward regressions comparing identical sets of dependent and independent variables yielded the same model for five regressions and different models for nine regressions. As compared to the stepwise models, the backward regressions tended to create models with a greater number of independent variables. Of the 10 crime and demographics models executed stepwise, only 13 independent variables were necessary for all of the models, for an average of 1.3. For the comparable backward

models 21 independent variables were necessary for an average of 2.1. This added complexity did not necessarily yield a significantly more nuanced understanding. In many of these models, the additional variable was merely an additional measure of family structure. In a simpler form, the stepwise models adequately communicate the significance of family structure, without the redundancy of an additional and similar measure. When comparing these analyses, however, the increased experimentwise error rate introduced by stepwise regression must be considered a drawback.

The difference was more pronounced for the models involving academics and demographics. These stepwise models each used two independent variables while the backward models each used six. For these two categories, the stepwise models were

TABLE 4. Stepwise Regressions

Independent	Dependent	r	r^2adj.	F	P	Included	Beta	t
Delinquency	English	0.589	0.316	11.142	0.000	ADW	-0.373	-2.579
						Property	-0.304	-2.103
Delinquency	Math	0.703	0.457	13.339	0.000	Property	-0.357	-2.853
						Loiter	-0.331	-2.814
						Sex Off	-0.263	-2.153
Neighborhood	ADW	0.587	0.313	11.031	0.000	Fem/HH	0.651	4.651
						Mar/HH	-0.376	-2.683
Neighborhood	Battery	0.576	0.300	10.425	0.000	Mar/Fem	-0.685	-4.566
						Owner	0.376	2.502
Neighborhood	CSA	0.306	0.073	4.453	0.041	Mar/HH	0.306	2.110
Neighborhood	Property	0.372	0.119	6.927	0.012	Fem/HH	0.372	2.632
Neighborhood	Loiter	0.542	0.260	8.720	0.001	Fem/HH	0.603	4.149
						Mar/HH	-0.333	-2.294
Neighborhood	Weapons	0.342	0.096	5.699	0.021	Fem/HH	0.342	2.387
Neighborhood	Robbery	0.691	0.453	15.896	0.000	Fem/HH	1.168	6.023
						BA	0.792	4.087
Neighborhood	Sex Off	0.460	0.193	11.536	0.001	Mar/Fem	-0.460	-3.396
Neighborhood	Total	0.516	0.250	15.638	0.000	Fem/HH	0.516	3.954
Neighborhood	No CSA	0.533	0.268	17.099	0.000	Fem/HH	0.533	4.135
Neighborhood	English	0.782	0.593	53.871	0.000	Poverty	-0.419	-2.539
						Fem/HH	-0.403	-2.444
Neighborhood	Math	0.780	0.590	32.705	0.000	Fem/HH	-0.521	-3.961
						Mar/HH	0.321	2.420

Stepwise regression models generally included fewer variables.

TABLE 5. Backward Regressions

Independent	Dependent	r	r^2 adj.	F	P	included	Beta	t
Delinquency	English	0.604	0.334	12.049	0.000	Property	-0.350	-2.636
						Weapons	-0.377	-2.833
Delinquency	Math	0.703	0.457	13.339	0.000	Property	-0.357	-2.853
						Loiter	-0.331	-2.814
						Sex Off	-0.263	-2.153
Neighborhood	ADW	0.587	0.313	11.0.31	0.000	Fem/HH	0.651	4.651
						Mar/HH	-0.376	-2.683
Neighborhood	Battery	0.651	0.381	10.033	0.000	Poverty	-0.422	-2.065
						Mar/HH	-0.459	-3.435
						Fem/HH	1.016	4.662
Neighborhood	CSA	0.412	0.087	2.044	0.107	Med Inc	-0.555	-1.830
						Poverty	-0.689	-1.890
						Fem/HH	0.635	2.362
						Mar/Fem	0.473	2.119
Neighborhood	Property	0.323	0.084	5.014	0.030	HS Grad	-0.323	-2.239
Neighborhood	Loiter	0.542	0.260	8.720	0.001	Fem/HH	0.603	4.149
						Mar/HH	-0.333	-2.294
Neighborhood	Weapons	0.342	0.096	5.699	0.021	Fem/HH	0.342	2.387
Neighborhood	Robbery	0.729	0.497	15.476	0.000	Mar/HH	-0.999	-4.516
						Fem/HH	1.519	5.144
						Mar/Fem	0.800	2.950
Neighborhood	Sex Off	0.541	0.258	8.668	0.001	Mar/HH	-0.401	-2.756
						Fem/HH	0.586	4.029
Neighborhood	Total	0.516	0.250	15.638	0.000	Fem/HH	0.516	3.954
Neighborhood	No CSA	0.588	0.315	11.111	0.000	Mar/HH	-0.278	-1.988
						Fem/HH	0.659	4.712
Neighborhood	English	0.886	0.751	23.147	0.000	Owner	-1.023	-4.609
						HS Grad	1.706	5.296
						BA Grad	-1.168	-2.834
						Med Inc	0.728	2.254
						Mar/HH	0.478	1.779
						Mar/Fem	0.424	2.572
Neighborhood	Math	0.884	0.746	22.559	0.000	Owner	-0.926	-4.441
						HS Grad	1.895	4.853
						BA Grad	-0.579	-1.881
						Mar/HH	0.545	2.050
						Fem/HH	0.567	1.841
						Mar/Fem	1.038	3.103

Backward regression models were generally greater in variables included.

preferable for their simplicity. The six variables included in each backward model rendered them inadequately discriminating to be sufficiently informative.

As hypothesized, family structure categories appeared from these analyses to be a significant driver of school delinquency and academic issues. All but one of the 24 models of neighborhood demographics included a family structure variable. The only exception was the backward model for property crimes, which was inversely related to percentage of high school graduates. In several cases, multiple measures of family structure appeared in the same model, particularly for the backward approach. For example, female-headed households were represented as an independent variable for 19 of the 24. Also, as predicted poverty appeared in the regression models only three times, likely due to multicollinearity because of its high correlation with the more influential female-headed households. An interesting note is that the stepwise regression for robbery and neighborhood demographics yielded a model directly related to both female-headed households and, unexpectedly, percentage of college graduates.

All four models using individual crime categories as independent variables and academic scores as dependent variables included property crimes. Only once did one of the highly clustered crimes appear in the explanatory models. It seems likely that other crime variables fit the models better and the multicollinearity shared with the cluster variables prohibited their inclusion. For English the model included property crimes and ADW for the stepwise, and weapons possession and property crimes for the backward model.

For math the same model occurred for both stepwise and backward and it included property crimes, loiter-trespass, and sex offenses. For these two categories, stepwise and backward models were similar in both the number of variables required and

their predictive r^2 adjusted score (delinquency and English, stepwise r^2 adjusted = 0.316 and backward r^2 adjusted = 0.334, delinquency and math both stepwise and backward r^2 adjusted = 0.457).

Overall the stepwise models sufficiently explained the independent variables in a simpler format. The delinquency and academics were similar for both and likely not different enough to prefer one over the other. For the neighborhood and delinquency models, the simplicity of the stepwise and redundancy of the backward models, made the stepwise preferable. In the case of the neighborhood and academic models, too many variables were included in the backward to provide meaningful information.

Hypotheses

There were three main hypotheses relating school delinquency and academics. First, of the eight categories of crime for which a correlation analysis was performed, significant correlations between that crime and academic performance will be found for all categories except for chemical substance abuse. This hypothesis was supported by the data and is consistent with previous research. Second, it was predicted that the correlation analysis comparing academic performance to the total of school crimes no CSA will have a greater correlation than comparing academic performance to the total of school crime including CSA. This hypothesis was not substantiated. As discussed above, the differences in the scores were minor and did not approach significance. Third, it was hypothesized that all measures of non-substance related crime will be significantly correlated. This was also mostly substantiated since only one relationship of crime categories failed to reach significance.

This study made four primary hypotheses pertaining to neighborhood demographics and their relationship to local school functioning. First, any relationships of demographics and CSA will be positive with dimensions indicating high levels of neighborhood affluence, such as high education levels, income, or marriage rates. This hypothesis was substantiated only in that the percentage of married households was significant and that none of these relationships were negative. Second, families below the poverty line and percent of female-headed households will show high levels of positive correlation with school crime and negative correlation with academic achievement. This hypothesis was also supported by the data. Third, the ratio of married households to female-headed households will show the inverse relationship exhibiting negative correlations with school crime and positive correlations with academic achievement. This hypothesis was also supported by the data. Fourth, a tentative prediction was put forward that ADW would be the crime category showing the strongest relationship with neighborhood demographics. This hypothesis was somewhat substantiated in that ADW, while not the highest predictor, was among the cluster of tightly correlated school crimes that were most closely associated with family structure and poverty, the others being robbery and battery.

This study made two primary hypotheses pertaining to the multiple regression models. It was predicted that female-headed household will be the main variable associated with the more serious school crimes. This was supported by the data. Secondly, due to the high association of female-headed households with percent of residents with high school degrees (inverse), percentage of residents with bachelor's

degrees (inverse), and poverty (direct), these variables were predicted to add little additional value to neighborhood demographic and school crime models. This was also reasonably well substantiated. Of the twenty regression models using demographics as independent variables and crime categories as dependent variables, poverty appeared in two models while percentage of high school and college graduates appeared in one each. Overall, the hypotheses were reasonably well supported by the data.

CHAPTER 5

DISCUSSION AND CONCLUSIONS

This study was able to add another important source for improved understanding of crime in schools. In particular, it was able to add another study to the relatively few that address victimization in high schools. This study was able to add a unique set of measurements that focused on police recorded data rather than the more commonly used surveys. The current study corroborated the fact that broad categories of police recorded crime are in fact a very effective measure of the disorder that impacts a school's academic achievement. The findings of this study reinforce the importance of intact families as well as safe and orderly schools for maximizing the potential of America's students. It is hoped that this research will bring a better understanding to its readers and will contribute in some small way to creating a brighter tomorrow for our schools and communities.

The following is a discussion of various decisions made and issues incurred in the process of this study as well as some suggestions for future research directions. First, will be a discussion of the outlier and the reasons that it was removed from the study. Next is an examination of the Modifiable Areal Unit Problem, how it impacted this study, and how that impact could have been minimized. The next section examines the relationships between crimes directed toward a specific victim. A fourth section discusses sex offenses and the potential reasons why it showed somewhat lesser

relationships with the other crimes directed toward a specific victim. A final section discusses the relationship of this current study with previous research as well as a discussion of possible future research.

Outlier

Table 6 shows the comparison of the outlier, Kennedy High School, with the mean, median, minimum, and maximum of all the schools studied without the outlier. What is significant is that in three categories the outlier was the single highest tally by a wide margin. CSA at Kennedy was 125.8 percent higher than the next highest school, property crimes were 29.7 percent higher, and sex offenses were 46.6 percent higher. Robbery at this school is actually below the mean of all other schools, while ADW and battery are above the mean but are the nearest proportionally compared with the other school crimes. These three crime categories that appear to signify the most intense criminal activity at a school are the least inflated and in the case of robbery below average. This lends credence to the idea that these three are the least subject to the judgment of the administration. In contrast, the numerically most inflated within the outlier school as well as greatest frequency crimes are by far CSA and property crimes. This might be compared to a couple of sports analogies. In football, pass interference could be called on every play as could three seconds in the key in basketball. They tend instead to be called only in instances that are particularly flagrant, repeated, or disruptive of the play. Similarly, when catching a student in the act of tagging or consuming alcohol, tobacco, or marijuana, a school authority may choose not to report this as a crime to law enforcement for a variety of reasons. These reasons include overwhelmed school

TABLE 6. Comparisons with the Outlier

	Min	Max	Mean	Median	Outlier	Factor
Math	328.67	366.67	344.99	345.00	349.00	
English	337.67	383.67	357.53	356.67	361.33	
ADW	0.09	4.33	0.78	0.58	1.29	1.65
Battery	0.68	7.83	2.21	1.61	5.59	2.53
CSA	1.71	10.10	4.92	4.42	22.81	4.64
Property	4.74	32.84	13.25	12.49	42.60	3.22
Destructive Devices	0.00	0.22	0.03	0.00	0.43	13.39
Homicide	0.00	0.07	0.00	0.00	0.00	0.00
Loiter	0.07	7.95	1.65	1.02	4.73	2.86
Weapons	0.43	5.07	1.73	1.58	4.73	2.73
Robbery	0.00	9.21	1.22	0.54	0.86	0.70
Sex Offenses	0.00	1.35	0.38	0.28	1.72	4.50
Total	11.19	59.60	26.18	23.82	84.77	3.24
No CSA	8.52	52.82	21.26	18.77	61.96	2.91

Minimum, maximum, mean, and median are calculated without the outlier. Factor refers to how many times higher the outlier scored in comparison to the mean.

authority, law enforcement unable to deal with lesser crimes, or a desire to communicate with a student in other ways. Rather than a wave of crime uncharacteristic of the other demographic and scholastic attributes at Kennedy High School, the data seem to indicate legal prosecution at a lower threshold than most of the high schools in LAUSD. It is beyond the scope of this study to judge the wisdom or effectiveness of such policies, but merely to establish the likely scenario at the outlier school.

Modifiable Areal Unit Problem

The modifiable areal unit problem (MAUP) is endemic to spatial study (Openshaw and Taylor, 1979). It is comprised of two separate but interrelated problems. The first is the scale problem which occurs as larger or smaller aggregations of data creates different results. The other problem is the aggregation problem which results in variations of data due to alternative units of analysis. The current study presented difficulties primarily due to this aggregation problem. First, the use of census data itself

constrains the possible aggregation of data, in that the final aggregation must ultimately be some combination of predetermined areal features which may or may not be the ideal areal unit for a given study. Short of an expensive and time consuming process of data collection, there is no solution to this aspect of the MAUP. However, another aspect of the aggregation problem that occurred in this study was preventable, and that was the use of zip code data rather than smaller and more flexible census tract data.

The use of zip codes created some limitations that were unforeseen at the time of the decision to use them and became obvious only after data were collected and particularly when mapped. Figure 1 shows that many LAUSD high schools are located very near the edge of the zip code, rather than more centrally placed within. This means that much of the data used, in particular that on the opposite side of the zip code, lie outside the school catchment area. It also means that a sizable portion of the catchment lies in a zip code either unrepresented in the data or represented in another school's data. Because of this, the data collected and the conclusions resulting from them must be asserted more tentatively than if the areal unit included in the statistical measurements had better matched the intended areas of study. The strength of this study's conclusions rests on an assumption that the data collected from the areal units included matched the data that would have been collected by a more accurate selection process. This proved too optimistic an assumption. That many of the results drawn from this data match neatly with much of the other literature on the subject indicates that the present study's results were likely not too badly distorted. Nevertheless, any conclusions drawn from this study must be tempered by an understanding of the MAUP issues within it.

One example of where this problem clearly manifested itself is the area surrounding Gardena High School, which is in the lowest single-parent category, but the school does not reflect that in its crime or scholastic scores. It seems that the population attending the school is exhibiting characteristics of South Los Angeles to its north or Compton to its east, while the zip code population registers more similarly to Torrance at its west. In this instance another measurement unit would have been more appropriate.

As usual when dealing with the MAUP, a precise analytical solution is unlikely to resolve all of these problems (Openshaw 1984). However, improvements are possible and revolve around using an areal unit smaller than zip codes. In particular, the census tract, which contains many of the same demographic categories, can be aggregated to form an area that more closely matches the area of study. The catchment area or a circle of some set distance surrounding the point representing each school could be used to create a polygon as a reference for data collection. Either all census tracts completely within or touching the polygon could have provided a more representative sample than zip codes.

While it must be conceded in hindsight that this decision was less than ideal, there are six main arguments in favor of the suitability of zip codes for the areal units chosen to perform this experiment. First, there is precedent for using zip codes when studying demographic data and its impact on schools (Payne, Gottfredson and Gottfredson 2003; Schreck et al. 2003; Gottfredson et al. 2005). There is no standard areal unit for this line of inquiry. Second, reasonable results were found in this study that were consistent with much of the literature reviewed above. Third, zip code data are rich with easily

obtainable variables in a way that smaller census geographies, in particular, block data are not. Fourth, it has been argued that the area itself has a greater impact on the school's functioning than the location of the students' homes (Welsh et al. 2000b). Therefore, it is not required when studying the area in which a school is located to exactly represent its catchment area. Even short of using catchment areas, in hindsight, better options were available to represent neighborhoods than zip codes, which in some instances appear to represent only a portion of the neighborhood of interest. Fifth, in many LAUSD high schools, a large percentage of students are transported from outside the catchment area. Sixth, the area covered by LAUSD features large areas that are relatively homogeneous in their socioeconomic and ethnic makeup. Unlike other more compact urban areas, these types of changes are less drastic within a small space. In this study the effect of using zip codes, and not another more precise areal unit, though still present was likely less than it would have been in many other major cities. Therefore, it is likely that modifying the unit of study would not have had a drastic impact on the findings. Ultimately, this is a more exploratory study, using aggregated data and subject to the MAUP and ecological fallacy issues inherent in spatially aggregated data. Its findings can inform hypotheses for further work at the individual or household level.

Crimes Directed Toward a Specific Victim

As mentioned in the results section, loitering and crimes directed toward a specific victim – ADW, robbery, battery, and sex offenses - tended to cluster with certain demographic features, in particular family structure. It is important to remember when interpreting this information that these are not representations of raw numbers of

occurrences or detections of the individual activity. In the case of the specific victim crimes, the number of occurrences, detections, and prosecutions are likely the most similar when compared to other crimes. If a specific victim is involved, there is a greater likelihood that the school administration will report detection to police authorities. Inclusion of a specific victim also increases the likelihood of detection because an assault with a deadly weapon, fight, or sexual assault is a dramatic event that itself attracts attention while the victim may also seek to gain the notice of the school. In contrast, possession of weapons, substances, or graffiti are by their nature generally furtive acts. Therefore, the odds of detecting CSA, property crimes, and weapons possession are much smaller when compared to crimes involving a specific victim. Once detected, school authorities are much less likely to choose to prosecute due to a perception that these are less serious crimes without a specific victim who may seek discipline for the perpetrator.

This logic implies that loiter-trespass may present more serious problems than might be assumed. It seems unlikely that schools already burdened by violent crime would prosecute other young people merely socializing on campus when they do not belong there. Given its demographic and delinquency associations, however, this may suggest that those prosecuted for loiter-trespass are often violent, drug dealers, or gang members. More research is required to come to any firm conclusions.

Sex Offenses

Sex offenses comprise one category lagging somewhat in its association with other crimes directed toward a specific victim as evidenced by lower r-score between it and ADW ($r=0.596$, $p=0.000$), battery ($r=0.629$, $p=0.000$), and robbery ($r=0.591$,

p=0.000). These r-scores are on the high end of the middle cluster of relationships between school crime categories, but still represent a meaningful gap between them and the upper cluster of r-scores discussed in the results section. Sex offenses also showed the lowest r-scores of any non-CSA crime category with the cumulative crime measures.

Several possible reasons could explain this. First, since most school victimization is male-on-male, when school violence intensifies, it may do so more between males than between genders. Of course, this statement is made under the assumption that the sexual offense is taking place as it generally does between a male perpetrator and a female victim. A second possibility is that many sexual assaults may take place more furtively than other types of assaults. Given the stigma and shame associated with rape, victims may be unlikely to report such incidents. This circumstance makes getting an accurate count of sexual assaults very difficult. Either of these explanations is plausible but this study is not designed to be conclusive on the issue.

Comparisons with Previous Studies

This study replicated the numerous findings that the presence of single-parent households contributes to greater school disorder (Williams et al. 2002; Beyers et al. 2003; Burrow and Apel, 2008). This study also supported the results of several others in finding a connection between low income and school disorder (Welsh, Greene and Jenkins 1999; Welsh, Stokes and Greene 1999; Khoury-Kassabri et al. 2004; Chen 2008). For the studies that divide school crime into categories, Clark and Lab (2000) found a small relationship between school thefts, but not school assault or robbery, with low family income. In comparison, this study replicated the finding of non-significance for

poverty and assault, in the current study called battery, but in contrast found a relationship between poverty and robbery. Payne et al. (2003) found that high poverty was associated with general student delinquency, such as property crimes, but not with student victimization. The current study replicated the association between poverty and property crimes, but sharply contrasts in finding significant associations between poverty and ADW, robbery, and sex offenses. These contrasts may be the result of differing methodologies. Both Clark and Lab (2000) and Payne et al. (2003) are based on questionnaire data. The threshold of victimization likely to be reported on a questionnaire by students, particularly at more orderly schools, may not reach the level of crime reported to the police.

Any of the findings associating substance abuse among adolescents with high income (Song et al. 2009; Chuang et al. 2005; Winstanley et al. 2008; Botticello 2009) or with high education (Botticello 2009) did not bear out at the school level. In this study the only demographic measure that was significantly associated with school substance possession was a slight direct relationship with the percentage of married couples with children. Song et al. (2008) found that high community levels of married couples as primary caregivers predicted lower odds of past 30-day drinking. Although this is a different measure of substance use, it is not consistent with the current study's finding of a slight direct association between the percentage of married couples with children and the criminal reports of substance use at schools.

The current study replicated the finding that high economic status is associated with high academic achievement (Brooks-Gunn et al. 1993; Carpiano, Lloyd, and Hertzman

2009; Dupere et al. 2010; Ainsworth 2002; Kawaleski-Jones, Dunifon, and Ream 2006). The current study also found a slightly larger association with percentage of families in poverty than for median income. This is somewhat similar to the finding of Carpiano, Lloyd, and Hertzman (2009) who found that the sharpest impact of income on academic achievement occurred in the step out of poverty. After this, the effect of increasing income eventually levels off. The relationship replicated here between low education and single-parent households is also well established (Brooks-Gunn et al. 1993; Plotnick and Hoffman 1999). Similar to the current study, Plotnick and Hoffman (1999) found that female-headed households with children showed significant associations with academic deficiencies.

The literature for weapons possession at school created a clear picture that possession increased as other crimes and forms of student victimization increased. The current study showed similar results. If there is any deviation, it is that this study underrepresented the relationship between weapons possession and crime, since other studies showed that associations with delinquency made weapons possessions several times more likely. Again this discrepancy is likely due to previous work using survey data, since most occurrences of weapons possession are not detected or prosecuted.

The current study added to the sizable body of research establishing the impact of an atmosphere of disorder and victimization on academic functioning. Other than CSA which was shown to be non-significant with academic performance, no one category of school crime stood out as being particularly associated with poor performance. Therefore, at least according to the measures used in this study, disorderly

behavior, such as property crimes, are no more associated with poor academics than more serious forms of victimization, such as ADW. Interestingly, the one crime measure that stood out as most predictive of poor academic performance was total crime no CSA. It was a better predictor than the next nearest individual crime measure in English test performance by 0.098 and in math by 0.112. The lack of difference between individual crime categories and academic performance as well as the high association of the cumulative measures taken together suggests that disorder of any kind in general, rather than victimization specifically, seems to drive a school's poor achievement. The measure of total crime including CSA was also a better predictor than any other individual category. That finding leads to the conclusion that it is a reasonable measure for school disorder.

Since the relationship between substance use and academic performance was mixed at the individual level, it is not especially surprising that no effect was found between substance possession and academic performance. In the case of substance possession, the measurement tool of police reports, as opposed to the more commonly used survey, may yield the most divergent results from the other measures. Campus substance possession and use likely have among the lowest rates of occurrences leading to detections and detections leading to prosecutions due to its secrecy and its relatively less serious nature when compared to victimization. Also, the more serious and violent crime administrators are dealing with, the fewer resources they will likely employ for prosecuting substance related issues.

However, Eitle and Eitle (2004) found a relationship between campus substance possession as measured by police reports and high dropout rates and lower rates of passing standardized tests. This difference may be due to their methodology, which included both high schools and middle schools. As discussed previously, the negative relationship between substance use and poor academic performance tends to occur at younger ages (Bryant et al. 2000; Tucker et al. 2008; Crosnoe and Riegle-Crumb 2007; Owens et al. 2008). Another possible difference is that the study area of Eitle and Eitle (2004) extended across most of Florida, which has a different ethnic composition than LAUSD. In particular, Florida has a greater percentage of Caucasian students, who have very different patterns of substance use than other ethnic groups (Allison et al. 1999; Winstanley et al. 2008; Botticello 2009; Brenner, Bauermeister, and Zimmerman 2011).

A variety of opportunities exist for future research in the area of schools, demographics, and delinquency. First, a study examining the various areal unit aggregations surrounding schools seems necessary given the divergence of methodologies used in previous studies. Another possible study could be done to uncover realities obscured by the ecological fallacy, the tendency to make assumptions about individuals from aggregated data (Robinson, 1950). This research would study individuals from a variety of school settings and would shed light on the various ways that students cope with their circumstances. Another possible study is a broadening of the current study's methodology, examining specific crime categories, to include a wider range of areas in terms of ethnicity, urban versus suburban or rural, or socio-economic status. The individual crime categories could also be aggregated, for example the highly

correlated victimization cluster, to ascertain whether there is a combination that is significantly more predictive of academic dysfunction than the total crime measure.

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