Race, Social Networks, and School Bullying

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Abstract

ROBERT FARIS: Race, Social Networks, and School Bullying
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Using data from a longitudinal survey of adolescents, this dissertation develops a social

network-based measure of school bullying. It considers three research questions: 1) what

accounts for racial disparities in bullying perpetration? 2) Are there racial differences in the

consequences of involvement in bullying? 3) What factors affect the likelihood of interracial

bullying? The first paper yields two divergent but not mutually exclusive views of bullying,

the first based on theories of delinquency, the second derived from the concept of status

insecurity. Bullies are less attached to school and parents, have more conflictive home lives,

are themselves picked on, have aggressive friends, and are more likely to be depressed,

findings consistent with theories of delinquency. At the same time, bullies are also

seemingly "normal" kids who participate in extra-curricular activities, are relatively popular,

have attractive friends, and may come from high socio-economic backgrounds. None of the

variables mediate the higher perpetration rates of African-Americans and Latinos.

The second paper tests the relationship between bullying involvement and five outcomes:

popularity, school attachment, depression, anxiety, and suicide attempts. Bullying others

increases popularity, but also increases anxiety and depression. Being bullied decreases

popularity and increases depression and the likelihood of suicide attempts. With one

exception, the effect of bullying on mental health and school attachment does not vary by

race. Minority students who bully others make larger gains in popularity than whites, suggesting one possible explanation for their higher perpetration rates.

The third paper examines the prevalence of bullying relationships among dyads. Bullying is most likely to be intra- rather than inter-racial, even after controlling for propinquity and social distance. Racial diversity of the school increases the prevalence of bullying, but does not influence the prevalence of interracial bullying. Bullying is also less likely to cross gender lines, but boys bully girls more often than girls bully boys. Girls bully each other more often than boys bully each other. Bullying is more likely to occur between those who are socially close and of similar social status. More attractive and physically developed adolescents are more likely to bully their less developed and less attractive peers.

ACKNOWLEDGEMENTS

To Johnny and Bradley Bruns, wherever you are, and to all the victims.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Figure

CHAPTER 1

MEASURING BULLYING FROM A RELATIONAL PERSPECTIVE

Preface

School bullying is both a common and a pernicious problem in the United States,

affecting millions of children with serious consequences. Bullying was a primary factor in

the majority of the highly publicized school shootings of the late 1990's (US Secret Service,

2000) and has been linked to depression, suicide, anxiety, low-self esteem, academic failure,

and detachment from school. The website www.bullying.org has hundreds of submissions

like the following:

When I was eight I moved to Texas from Michigan and I was starting at a new school. I can still remember the first day of school. I walked in and everyone looked at me as if I was a horrific monster. From that moment on I was not known by my real name, I was known only as "THE COODIE GIRL!" I had to be three feet away from everyone at all times, everyday I would get food, spit balls, trash thrown at me. At recess the only place I was allowed to go was way in the corner where the fences met about thirty feet away from everyone else. If I were to try to go and play on the playground, they (kids) would either leave or yell at me to leave. That lasted up until I was about twelve years old and in the seventh grade. I have attemped [sic] suicide many times, and have runaway twice. Now that I'm older and no longer picked on or bullied I have made it my business to put a stop to bullying and to help those who are victims to bullying. Hopefully someday this will not be a problem. Hopefully!

Another:

I am now 18 and I am only just getting my life back. From the age of 13 I was bullied because of my size. I would sit in class and people who I thought were my friends would make fun of me, they would call me names and take my stuff and brake [sic] it all the time. At first I tried to cope with it, but after 2 years of trying to cope I just stopped. I would make myself sick so that I would be able to stay home and not face them but after a bit it stopped

working I was told I had to go to school. One day, I was walking to my next class when a so-called friend came over a spat in my face and just walked off. That day I thought to myself that I had it and that I no longer wished to live, so I went home took a load of pills and tried to end thankful my mum came in and called 999. After that she try [sic] to talk, but I would just keep it all in and say a word. I went back to school and it was still going on. Day after day, I would try and cope try and not let them get to me, but it was to hard. I went home and slit my arm 5 stiches [sic] on each arm. That was just the first time. I have a big scar on my leg where I burned it with a piece of metal, I have scars all over me. I was taken out of school in year 10 and I have never gone back. I spent 6 month in my room not seeing anyone at all then my sister came and said that she was having a baby and that she wanted me to get better so that I can be there for the baby. So I did, I talked to people about what happened and I was put on tablets to help me get better. It has been two years since I last cut myself. I have a lovely niece and nephew. And yes i still think about cutting myself then I think if I did and I died, I would not be able to see them grown and be happy.

Some stories are even more ominous. After a similar account of abuse, betrayal, and

attempted suicide, one poster wrote:

In grade 9 the bullying got even worse. I was pushed every day and teased by everyone including a teacher. I had no one to turn to. I cried almost every day from the time school got out almost until I went to bed. I started to try to kill myself several times, but chickened out at the last minute. I then seriously began thinking about a way out. I thought so many times about bringing a gun to school and killing all the bullies and myself. If I had been able to get ahold of a gun I probably would have done it.

While these narratives contain no new insights, since it has already been established

that victimization is related to suicidality and weapon-carrying, they do put a face on the

bullying statistics and the seriousness of their implications. In addition to the shared theme

of abuse leading to violent and self-destructive thoughts and behaviors, these accounts share

another feature, conspicuous in its omission: the absence of any speculation about the

motive for the abuse. These victims, and many of the others who posted their stories on this

and other websites, tend not to theorize about the causes of the abuse, but take aggression as

a given. Where rationales are offered, they are often descriptions of the victims

themselves—"I was fat," or "I read—a lot"—and involved little or no speculation about the

bullies and their personal motives. The hoary example of having one's lunch money forcibly

taken by a bully is almost never encountered, further complicating rational interpretation of bullying.

This lack of speculation on the rationale for bullying is understandable—it is difficult, perhaps impossible, to fully understand another's motives, and especially so in the case of seemingly senseless aggression. It is not the purpose of this or most other sociological analysis either. While unconcerned with personal motive, this dissertation will attempt to understand underlying conditions that make bullying more likely to occur.

A quip sometimes heard in sociology circles is that sociology can be reduced to RCG—race, class, and gender. While unfair to those who study, say, organizations or religion, it is true that these three domains are the mainstays of sociological research. All too often, however, papers in sociology journals give mere lip service to these areas, treating race, SES, and gender as "control" variables, unworthy of further interpretation. In the literature on school bullying, the situation is even worse, as many studies fail to consider race, even as a control variable. Where racial differences are considered, they are rarely interpreted.

It is the premise of my research that significant differences among racial groups cannot be dismissed, but require exploration. The dissertation is comprised of three articles. The first attempts to explain observed racial differences in bullying behavior by considering a range of factors, including SES, neighborhood context, and peer influence. The second article examines whether there are racial differences in the outcomes associated with

bullying, and whether those differences are further modified by the racial diversity of the school. The final article asks whether bullying is predominantly inter- or intraracial, and whether the racial diversity of the school modifies this possible predilection. Before presenting these analyses, however, it will be necessary to first define bullying and to introduce an innovative approach to measuring it which will be used throughout this dissertation.

What is Bullying?

Due in large part to the pioneering work of Dan Olweus, research on bullying has tended to define it as "engaging in negative actions against a less powerful person repeatedly and over time" (Olweus, 1999; Kaukiainen et al., 2002). However, observing and measuring the relative power of schoolchildren is complicated, and in practice, the definition is circular: if someone is being repeatedly victimized, they are less powerful. Additionally, if one student harasses many other students, but only one time each, this may be excluded from this definition of bullying.

Accordingly, I abandon the relative power aspect of the definition, or rather, accept the circular logic of victimization implying power inequity, and focus instead on victimization itself. I also relax the requirement of repeated victimization, acknowledging that a student may pick on her peers regularly, but no single student on a frequent basis. Therefore, I define bullying as a situation, however brief, where a perpetrator harms a victim who is a peer, using physical (hitting, tripping, etc.), direct verbal (name-calling, threats of violence),

or indirect (rumor-mongering, ostracism, etc.) aggression, and in a context of a continued relationship.

It would appear difficult, then, to distinguish this definition of bullying from run of the mill aggression, and with more serious forms, such as homicide. The definition is intentionally broad, and has extensive overlap with standard definitions of aggression. However, it is important to note that there are forms of aggression—such as vigorous arguments and fistfights—that do not have clearly discernable perpetrator and victim relations.

This definition of bullying also distinguishes it from other aggressive relations where there are clear perpetrators and victims—such as homicide or armed robbery—by virtue of the continued relationship. By and large, most robbers do not seek or expect to maintain relations with the owners of the convenience stores they rob. In contrast, those who bully others, most often in schools or neighborhoods, are constrained by the expectation of a future relationship. This does not necessarily imply continued direct interaction, but the minimal relations involved in going to the same school or living in the same neighborhood. Finally, by defining bullying as an act among peers, I also distinguish it from acts such as child abuse and most of what is increasingly referred to as workplace bullying. These are relations where there is a structural imbalance of power such as parent-child, boss-employee, which is legitimized and supported by the legal apparatus of the state, and as such, involves different dynamics.

It is important to note one element of the concept that is not obvious in the above definition. In contrast to both common wisdom and much research, I avoid assuming that "bully" is a fixed role to be occupied, that kids can be categorized as bullies, or victims, or bystanders.[1] Researchers often assume that bullies are stable 1.roles, as evidenced by the phrases "reinforcer bullies" and "bully-victims." For the purposes of this research, "bully" is a verb, not a noun, and whether these relations coalesce into stable 1.roles remains an empirical question beyond the scope of this analysis.

Measuring Bullying

There are several different approaches to measuring bullying perpetration. Most studies rely on self-reported bullying behavior, often using questions designed by Olweus (1986; 1996). These studies typically define bullying for respondents and then ask them how often they were bullied by other students in the past couple months, and then how often they bullied other students (e.g., Nansel et al., 2001; O'Moore et al., 1997; Pellegrini et al., 1999). Response categories in the Olweus Bullying Questionnaire are none, "only once or twice," "2 or 3 times a month," "about once a week," and "several times a week" (Olweus, 1996). Solberg and Olweus (2003) argue that a cutoff of 2 or 3 times a month is appropriate for estimating the prevalence of bullying, as it is easily reproduced by other research and corresponds to sharp changes in outcomes related to bullying.

A second approach to measuring bullying involves peer nominations (e.g., Espelage and Holt, 2001). Students are asked to nominate a small number of students who stand out

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[1] However, for the sake of rhetorical convenience, I will occasionally refer to bullies and victims, as opposed to bullying behavior, etc.

on certain dimensions like aggression, popularity, or victimization. A third, related approach is to ask students, usually in a small unit such as a classroom, to rate *all* of their classmates on a variety of dimensions such as aggression, victimization, etc. (Salmivalli et al., 1996).

Both of the self-report and the peer-nomination approaches have advantages. The self-reported frequency approach advocated by Olweus is useful for determining the prevalence of bullying, which is vital to any intervention efforts. However, self-reports of behavior that is both sanctioned and potentially ambiguous, in that bullies may not always realize they are bullying, is hardly ideal. Additionally, imposing a cutoff may be necessary to determine prevalence, but is ultimately arbitrary and results in a loss of information.

The peer nomination approach is quite useful, and takes advantage of multiple sources of information rather than simply relying on students' own admissions of bullying behavior. However, when only a few nominations are allowed for any given behavioral dimension, the aggressive behavior of "minor offenders" is ignored. The peer rating approach, whereby each student receives a rating rather than the handful who stand out, addresses this issue, but is impractical for units significantly larger than a classroom and would therefore miss inter-classroom aggression. Finally, none of these approaches fully capture the relational aspect of bullying. Peer nominations may provide reliable information on who the bullies and victims are, but it does not tell which bullies pick on which victims, and why.

One approach that has only rarely been applied to the study of bullying relationships is social network analysis. A social network describes a set of actors and the relationships

between them for virtually any form of interaction, from the general (friendship) to the specific (spitting). Social network analysis is a systematic way to discover patterns in the relations among actors, and is frequently applied to the study of friendship among children and adolescents. Several studies have used social network analysis to examine the relationship between popularity or centrality and involvement in bullying (e.g., Farmer et al., 2003), but to the author's knowledge, only one study has used social network analysis to understand patterns of bullying relationships themselves, and this was a study of Dutch 4-year olds (Vermande et al., 2000).[2]

Bullying is well-suited to social network analysis. First, it tends to occur among children who interact with each other at least semi-regularly in the context of relatively bounded spaces such as classrooms, playgrounds, and *cul de sacs*. Second, it is inherently relational, always involving a perpetrator(s) and a victim(s). Accordingly, the study on which this dissertation is based asks students to nominate up to five other students who, in the past three months, "picked on or were mean" to them, and up to five whom they picked on or were mean to. Students were instructed to consider not just physical or direct verbal abuse, but also acts like rumor-mongering and ostracism. They were also instructed to disregard playful teasing. For each bully or victim nominated, students reported the frequency with which the bullying occurred and the type of bullying that occurred: physical, direct verbal, and/or indirect aggression.

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[2] Chan (2006) collected data that asked victims to nominate those who bullied them, but does not appear to analyze them from a social network perspective.

By combining information from both sets of nominations (victimization and perpetration) it is possible to incorporate information from multiple sources, rather than solely relying on potentially biased self-reports. Observational results suggest that self-reports may drastically underestimate involvement in bullying: despite national estimates showing that less than 10 percent of all report bullying others on a weekly basis, one study used a hidden camera on a playground to observe the phenomenon, and found an episode of bullying approximately every eight minutes (Knopp, 2002). A similar study, using hidden cameras, found that 85 percent of bullying incidents had an average of 4 other peers involved (Craig and Pepler, 1997). While technically these are false comparisons, they are suggestive of an incongruency between self-reports and actual behaviors, and data presented below appear to confirm that self-reports underestimate the true amount of bullying.

Equally importantly, this network-based method also allows us to move beyond questions of who bullies and who is victimized, to those about bullying *relationships*. We can now answer, for example, questions about whether a pair of students of a different race are more likely to pick on each other than a pair of students of the same race, or whether the difference in social status between two students predicts whether one picks on the other.

I use network data to measure bullying in two distinct ways. First, it is important to note that I consider there to be a bullying tie between A and B if either A nominates B as a victim *or* B nominates A as a bully. By merging the data from the two relations in this way, I calculate bullying *outdegree*, or the number of other *students* each student bullied in the past three months, which is the dependent variable in chapter 2. Similarly, I calculate the bullying

indegree by summing the number of other students who picked on each student in the past three months. Both bullying outdegree and indegree are used in chapter 3as independent variables in models of a variety of important outcomes.

Second, the social network approach enables the analysis of bullying in terms of a relationship. Accordingly, chapter 4 shifts the unit of analysis from the individual student to the dyad, and models the likelihood (among all possible dyads in the network) that student A bullied student B.

Data Source

The *Context of Adolescent Substance Use* study (hereafter, *Context*) is a longitudinal survey of all middle and high school students in three counties in North Carolina. The focus of *Context* is on alcohol, tobacco, and drug use, but it collects information on a wide range of other topics as well. The three counties were selected based on willingness to participate and proximity to Chapel Hill, North Carolina, where data collection and management occur. Unlike the Chapel Hill area, however, the participating counties are predominantly rural, with higher proportions of blacks and lower median incomes than national averages. The biannual in-school survey began in the spring of 2001 with wave 1; wave 5 data was collected in the spring of 2004. After wave 5, *Context* continued with two additional annual surveys, which means that the oldest cohort has been followed through high school.[3]

At wave 1, all public school students in grades 6, 7, and 8 for each county were asked to participate, resulting in over 5,000 participants divided among 29 networks. By wave 4

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[3] Wave 6 was administered in the fall of 2004, wave 7 was administered in the fall of 2005.

and 5, these 29 networks had been condensed into 19 school networks, as the students moved out of elementary and middle schools, and into high schools. The response rate has been maintained at or above 80% for the five waves of data which have already been collected. In addition to the in-school student survey, the Contexts study also interviews one parent annually for a subsample of students, asking questions about substance use, parenting style, and household composition. Finally, the home addresses of all students are geo-coded, allowing the study to link to powerful geographic datasets which provide important information about neighborhood setting.

In addition to questions concerning substance use, aggressive behaviors, academic performance, depression, dating violence, school attachment, suicide attempts, physical development, family life, and neighborhood characteristics, the survey asks students to nominate up to five of their best friends. Beginning in waves 4 and 5, the survey adds questions asking students to nominate up to five students whom they "are mean to or pick on" and up to five students who are mean to or pick on the respondent. The survey also asks questions regarding the manner of bullying and the frequency with which it occurs. Accordingly, all analyses in this dissertation use data from waves 4 and 5.[4]

Distribution of Bullying Behavior

Table 1.1 shows the distribution of bullying outdegree and indegree, by demographic characteristics. The mean bullying outdegree, and necessarily, indegree[5] at wave 5 is .60,

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[4] Later waves are not used because data were not cleaned at the time of writing, and the largest county dropped out of the study after wave 5.

[5] The overall means are identical because every act of perpetration is also registered as an act of victimization.

and ranges from 0 to 9 for outdegree, and 0-15 for indegree, suggesting that perpetration is somewhat more broadly distributed than victimization. Nonetheless, only a minority of students are implicated in bullying: 35% picked on at least one other student, and 32% were picked on by others. There is some overlap of the two categories, as 12% of all students are involved both as bullies and victims. These figures are higher than rates of self-reported bullying (a 19 percent perpetration rate) reported by Nansel et al. (2001), but this may be due to sample differences (rural North Carolina vs. the US) or in the method of measurement, as self-reports may underestimate the true prevalence of bullying.

Blacks have higher outdegree than Whites, a difference that is significant at the .05 level (one-tail test), and Whites are more likely to be victims, with significantly higher indegree than African-American students. Latino students have significantly higher outdegree and indegree, compared to both Blacks and Whites. Somewhat surrprisingly, girls have higher outdegree than boys (again, a statistically significant difference at the .05 level), although slightly fewer girls perpetrate than boys. Girls also have higher mean indegree. As has been reported elsewhere (Olweus, 1993), involvement in bullying, either as victim or perpetrator, declines after the transition to high school, and these data appear to confirm this trend.

Table 1.1: Mean Bullying Involvement, by Demographic Characteristics

	Bullying Outdegree	Proportion with Bullying Outdegree>0	Bullying Indegree	Proportion with Bullying Indegree>0
White	0.56	0.35	0.62	0.33
African-American	0.63	0.36	0.55	0.31
Latino	0.91	0.48	0.86	0.38
Other minorities	0.52	0.31	0.63	0.31
Boys	0.65	0.36	0.59	0.29
Girls	0.70	0.34	0.82	0.36
8th grade	0.85	0.41	0.89	0.37
9th grade	0.61	0.32	0.67	0.31
10th grade	0.56	0.31	0.54	0.29
All	0.60	0.35	0.60	0.32

N=4,567

Table 1.2 shows the distributions of four self-reported types of bullying behavior: whether the respondent had, in the past three months, "picked on someone," "spread a false rumor about someone," "excluded another student from your group of friends," and "hit or slapped another kid." Self-reported rates of these behaviors are generally lower than reported rates of bullying outdegree, which again may reflect underreporting. The lone exception is the general "picked on someone" item, which may have higher prevalence because no qualifications were made to the seriousness of the behavior, and it was not limited to peers (and so could involve younger siblings). Further evidence of underreporting is found in the fact that over one-quarter of the students who claimed to have *never* picked on someone, hit someone, spread a false rumor, or excluded someone were nominated as having bullied other students at least once in the past three months.[6] Bullying outdegree is significantly positively correlated (at the .001 level) with a latent factor score comprised of these self-reported items,

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[6] Of course, it is impossible to eliminate the possibility that the difference is due to overreporting in the network data. Ultimately, it seems more plausible that the impulse to underreport one's own bullying behavior is stronger than the desire to falsely accuse another.

13

but the correlation coefficient is only a modest .23, again suggesting important differences
between the measures.

Some interesting differences become apparent when comparing demographic groups
on these measures: Whites are less likely than Blacks to hit or pick on other students, but
more likely to engage in indirect bullying by spreading rumors or ostracizing other students.
Latinos, in contrast to their higher levels of bullying outdegree and indegree, generally
exhibit significantly lower rates of self-reported bullying than African-American students.
Compared to boys, girls report higher rates of having picked on or excluded someone
(significant at the .001 and .05 levels, respectively), but significantly lower rates of hitting or
spreading rumors. With the exception of picking on others, which increases with age, these
behaviors also decline as students move through school.

Table 1.2: Self-Reported Bullying Involvement, by Demographic Characteristics

	Picked on someone	Spread Rumors	Excluded Someone	Hit Another Kid
White	0.46	0.22	0.29	0.27
African-American	0.50	0.15	0.20	0.38
Latino	0.36	0.20	0.21	0.33
Other minorities	0.49	0.17	0.30	0.39
Boys	0.43	0.22	0.24	0.33
Girls	0.50	0.18	0.28	0.31
8th grade	0.45	0.24	0.27	0.36
9th grade	0.48	0.20	0.26	0.31
10th grade	0.49	0.16	0.25	0.27
All	0.47	0.20	0.26	0.32

N=4,567

Data on the type of bullying were collected in the network section of the survey as
well. For each nomination (of either perpetrators or victims), students reported whether

14

direct verbal, indirect, or physical abuse occurred.[7] Table 1.3 shows the proportions of

perpetrators and victims who ever engaged in or experienced each type of bullying. Direct

verbal abuse was the most common type of bullying, followed closely by indirect bullying,

while physical violence was less commonly experienced. Interestingly, perpetrators, when

discussing their abuse of their nominated victims, reported higher rates of verbal abuse than

did victims, though victims reported higher rates of indirect aggression than did perpetrators.

Since these are closed networks, and only within-network behavior is considered, the overall

rates should be identical—as is the case with physical violence. That there are differences in

the perceptions of perpetrators and victims further bolsters the importance of using

information from both parties.

Table 1.3: Type of Bullying as a Proportion of All Involved, by Demographic Characteristics

	Verbal Abuse		Indirect Aggression		Physical Violence	
	Victim	Perpetrator	Victim	Perpetrator	Victim	Perpetrator
White	0.76	0.79	0.71	0.65	0.49	0.43
African-American	0.59	0.85	0.62	0.48	0.35	0.46
Latino	0.76	0.86	0.61	0.56	0.51	0.50
Other minorities	0.77	0.76	0.72	0.50	0.53	0.51
Boys	0.72	0.82	0.62	0.52	0.55	0.53
Girls	0.71	0.80	0.73	0.62	0.39	0.39
8th grade	0.74	0.82	0.65	0.56	0.48	0.45
9th grade	0.69	0.81	0.70	0.56	0.45	0.46
10th grade	0.70	0.80	0.71	0.61	0.44	0.44
All	0.71	0.81	0.68	0.58	0.46	0.45

N=1,203 involved as perpetrators; 926 involved as victims

Comparison with table 1.2 is difficult, because table 1.2 reports overall rates of the

behavior, while table 1.3 only includes rates of each type of bullying for those who were

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[7] The survey asked these as separate questions, so it is possible for one relationship to involve all three types of abuse.

involved. However, we again find that African-Americans are less involved in indirect

aggression than Whites, but more likely to pick on or physically abuse others. In contrast to

table 1.2, girls are more likely to report involvement in indirect aggression than boys, but are

again less likely to have physically attacked one of their peers. Interestingly, while the rates

of bullying involvement (using network nomination data in table 1.1) show a decline as

students move through school, there are no clear patterns of change in the type of bullying

that occurs during this process.

Finally, to highlight the seriousness of the problem, table 1.4 shows the results of the

questions asking students to report on how often they were picked on by each perpetrator

they nominated (and vice versa for those they picked on). Table 1.4 considers only those

who were ever involved as victims and perpetrators, and each were given a 1 if they ever

reported someone picked on them weekly (or vice versa), and a 0 otherwise. It is important

to note that this represents a conservative estimate, as students who report being picked on by

five people, each only once or twice a month, would not be considered as being victimized

weekly here. The results are disturbing: 60 percent of those who report being victimized say

it occurs at least once a week, and similarly, 59 percent of those who bully others admit to

doing it weekly. These rates of weekly bullying are somewhat higher than the 48 percent

who self-reported weekly bullying in national estimates (Nansel et al., 2001). Somewhat

surprisingly, given their lower rates of perpetration, Whites have the highest rates of weekly

involvement as either victims or perpetrators. Girls are also significantly more likely than

boys to be involved on a frequent basis. Again, there is no clear pattern with respect to

grade.

Table 1.4: Frequency of Bullying, by Demographic Characteristics

	Victimized Weekly	Perpetrates Weekly
White	0.63	0.65
African-American	0.60	0.57
Latino	0.45	0.40
Other minorities	0.48	0.47
Boys	0.50	0.50
Girls	0.67	0.65
8th grade	0.63	0.61
9th grade	0.56	0.55
10th grade	0.59	0.61
All	0.60	0.59

N=1,203 involved as perpetrators; 926 involved as victims

The fourth chapter of this dissertation considers bullying from a dyadic perspective, using social network analysis techniques. The methods (described in further detail in that chapter) are computationally intensive—some networks took over a month to analyze—such that it was impossible to analyze the five largest high school networks, leaving fourteen for the dyad analysis. Remarkably, the resulting subsample is very similar demographically to the full sample: the gender distribution is identical, and only one racial category differs from the full sample by more than 1 percentage point (Latinos represent 6 percent of the subsample, compared to 4 percent of the full sample, a non-significant difference). Because the five networks are all from high schools, there are fewer high school students in the subsample, and bullying rates are somewhat higher (a mean outdegree of .74 compared to .60 for the full sample). However, multivariate models (in chapter 2) find no evidence that grade, age, or network size have any significant effect on bullying behavior.

17

Table 1.5 shows the distribution of bullying relations from a dyadic perspective. Again, we include all possible dyads in each of the fourteen networks, and consider a tie from A to B to be present if either A nominates B as a victim, or B nominates A as a bully. Table 1.5 shows the rate, per 1,000 possible dyads, at which bullying is present. With the exception of Black-Other pairs, intra-racial bullying is more common than interracial bullying. With the exception of the other minority category,[8] African-Americans appear to be more often the perpetrators rather than the victims of interracial bullying: blacks bully whites and Latinos more often than whites and Latinos bully blacks. Latinos appear to be somewhere in the middle, picking on Whites and other minorities more often than the reverse, but also picked on by blacks. Whites and other minorities—who bully each other at nearly identical rates—would appear to be at the bottom of this hierarchy, but again it is important to emphasize that most bullying appears to be within race.

The pattern for gender is similar to that of race, with higher rates of bullying within sex than across sex. The highest rates of bullying are between pairs of girls, significantly higher than the rate among pairs of boys. However, when we consider cross-sex bullying girls are significantly more often the victims of boys than vice versa.

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[8] In table 5, the "other minority" category is predominantly multiracial and American Indian. In multivariate analysis, however, Latinos proved to be of insufficient numbers for separate analysis, so they are included in the other minority category as well.

Table 1.5: Bullying Rate Per Thousand Dyads, By Race and Gender

Dyad Type (Sender-Receiver)	Mean	Frequency
Black-Black	3.60	456
Black-Latino	1.57	18
Black-Other	5.86	79
Black-White	2.26	201
Latino-Black	0.87	10
Latino-Latino	22.48	84
Latino-Other	4.64	7
Latino-White	2.34	42
Other-Black	4.30	58
Other-Latino	0.00	0
Other-Other	6.92	23
Other-White	3.95	82
White-Black	1.37	122
White-Latino	2.06	37
White-Other	3.94	76
White-White	4.77	844
Female-Female	4.60	813
Female-Male	2.00	381
Male-Female	2.75	523
Male-Male	3.48	713
Overall	3.19	2430

N=761,558

The summary statistics presented in this chapter raise the prospect of a number of interesting, often counterintuitive relationships. They suggest that girls are more involved in bullying than boys, both as victim and as perpetrator. They suggest that most bullying occurs within racial groups, but also that minorities are more likely to bully kids of other races than are whites. Whether any of these apparent relationships are "real," in the sense that they cannot be explained away by considering, for example, economic differences, or how many activities members of each group engage in together, is the question to be addressed in subsequent chapters.

There are several important findings from the above tables, but whether one group is more likely to bully than another is not one of them. Rather, the most important implications are that the approach of measuring bullying using two sources of information rather than one is an improvement over standard practice, and that much can be gained from examining bullying from a relational perspective, using social network analysis techniques.

This dissertation proceeds as follows. Chapter 2 analyzes bullying perpetration, measured by bullying outdegree. It tests cultural and criminological theories in an effort to explain differential rates of perpetration by race. Chapter 2 also introduces the concept of status insecurity, and finds that it is positively related to bullying perpetration. Chapter 3 tests the effect of bullying involvement, either as victim or as perpetrator, on a variety of psychological and social outcomes. It asks whether the relationship between bullying and these outcomes varies by race, and further, whether those effects are themselves moderated by school diversity. Finally, chapter 4 considers bullying from a dyadic perspective. Here, all monadic influences on bullying are controlled for, enabling the analyst to address dyadic relationships. Chapter 4 therefore considers the questions of whether bullying is predominantly inter- or intra-racial, how structural factors like social distance are related to bullying relations, and how social status and physical differences matter for bullying. Chapter 5 considers the importance of these findings for prevention efforts.

CHAPTER 2

RACIAL DIFFERENCES IN SCHOOL BULLYING: THE ROLE OF SOCIAL

BONDING, SOCIAL LEARNING, AND STATUS INSECURITY

I. Introduction

Bullying is a common problem in American schools: nearly one-fifth of all school-aged students in the United States bully other students on an annual basis, and 17 percent are victimized at least once a year (Nansel et al., 2001). Despite its frequency, and great public concern over its consequences—stemming, in part, from the highly publicized school shootings of the late 1990's—the reasons some children bully others are still not completely understood. If bullying is instrumental, it is not obviously so. The hoary example of the bigger boy who forcibly extorts lunch money from smaller victims is a cliché that is almost never seen in actual accounts of bullying. Indeed, personal accounts, like the one below (from a www.yahoo.com bullying prevention group) rarely speculate on their abusers' motives:

> I'm a dad now, but back when I was a kid, I was a target. It was very easy to make me cry…I was different from the other kids in a lot of ways. While my parents were poor, they were well educated…I dressed and talked differently than most of my peers, and didn't understand most of their ideas of fun. I got picked on a lot. There was a lot of violence involved, along with social isolation. Kids amused themselves by making me cry. I dealt mostly by retreating into books, which didn't exactly win me friends…I went through dozens of glasses, as I got hit in the face a lot. I got kicked in the balls a lot. I got tripped a lot, spit on a lot, threatened even more…

As with many accounts of bullying, the victim above explains the abuse by referring to his own characteristics rather than those of the bullies—he was smart, dressed and talked differently, read a lot, and cried easily. Perhaps convincing the victims that their personal characteristics caused the abuse is the most insidious consequence of bullying.

In any case, while it is difficult to determine specific motives for abusing others, researchers have learned much about factors that make bullying more likely to occur, discussed in depth below. While many studies have focused on the predictors of bullying (for a review, see Smith et al., 1999; and Espelage and Swearer, 2003), gaps in the literature remain, including the role of race and the effect of social attachments and pressures. While many studies have focused on the role of one or two factors, few have included a wide range of variables, from multiple contexts. The purposes of this analysis, therefore, are threefold. First, this paper introduces a new network-based measure of bullying which mitigates self-reporting bias. Second, the paper applies a wide range of variables, drawn from criminology, psychology, and a new concept of status insecurity, to bullying behavior. Third, this analysis attempts to use these theories to explain racial differences in perpetration.

The analysis is guided by three strands of theory. First, cultural theories of racial disparities generate expectations of racial differences in bullying perpetration. Second, classic criminological theories provide general rationales for bullying, though they have little to say about race specifically. Finally, the prevailing view of bullying is that it is deviant behavior, perpetrated by delinquents with psychological problems and bad home lives. While this may often be true, it does not reflect the complete picture. In many cases

otherwise typical adolescents from nice neighborhoods and peaceful, successful families are cruel to their peers, and new explanations are needed to understand why. Accordingly, in the third theoretical section I propose a new concept of status insecurity to understand why seemingly "normal" kids bully others.

II. Evidence of Racial Differences in Bullying

There are reasons to expect racial and ethnic differences in school bullying in the United States. First, minorities are more likely to live in impoverished, high-crime areas, and exposure to violence may, according to criminological theories of social learning, increase aggressiveness at school. Second, competing criminological theories of structural strain, beginning with Merton (1938) suggest that, denied legitimate means to achieve a middle class lifestyle, impoverished youth explore illegitimate means to attain those ends, resulting in deviant value systems that glorify toughness and violence (Cohen, 1955). One manifestation of strain is the "cool pose," a presentation of nonchalant toughness adopted by African-American males as a reaction to centuries of discrimination and oppression (Majors and Billson, 1992). Additionally, Ogbu's oppositional culture hypothesis suggests that, again in reaction to institutional discrimination, some minority groups reject academic values and attitudes as "White," and are disruptive and poorly behaved in school (Ogbu, 1991).

Research examining the role of race in bullying, however, is relatively slim, and offers mixed results. Among the European studies of bullying, at least three (in three separate countries) found no significant racial differences in either bullying or victimization: the countries include Norway (Junger-Tas, 1999); Britain (Boulton, 1995); and Germany (Losel

and Bliesener, 1999). However, others, such as Wolke et al.'s (2001) cross-national study of Britain and Germany, found that ethnic minorities are significantly more likely to be bullied. Elsewhere, Rigby's (2002) large-scale survey of Australian school children found that Aboriginal students were significantly more likely to be harassed on a frequent basis.

In the United States, results are equally mixed. One study found that Hispanics were more likely to bully other students than White or African-American students (among which there were no significant differences with respect to the likelihood of bullying others) (Nansel et al., 2001). The same study found that one quarter of all those who were bullied were harassed because of their religion or race, and that African-American students were more likely to be bullied than either Whites or Latinos (Nansel et al., 2001). However, another study found that African-American students were significantly more likely than others to bully their peers (Graham and Juvonen, 2002).

Complicating the picture, Hanish and Guerra (2000), in a study of a large Midwestern state, found no significant differences in perpetration or victimization between African-American and white students, but they did find that Latinos tended to be victimized less frequently than others. Eisenberg et al. (2003) conducted a large study of victimization in 31 public middle and high schools in the ethnically and socioeconomically diverse Minneapolis/St. Paul metropolitan area. They concluded that Whites and Native Americans suffered significantly more harassment than African-Americans or students of other racial or ethnic backgrounds. While the evidence is murky, and much likely depends on the specific context, it appears that minorities tend to be involved in bullying more often than whites,

although there are no clear patterns as to whether they are more likely to be victims or bullies.

III. Cultural-Historical Explanations of Racial Differences

These empirical findings concerning race and bullying are valuable, but they are not accompanied by theoretical rationales. Instead, race is typically treated as a control variable. Unfortunately, there are, to the author's knowledge, no specific theories regarding race and bullying. Indeed, there are few true theories of bullying at all, and most work is either completely empirical or applies existing psychological or criminological theories. There are, however, many theories of race and the causes of racial disparities in a wide range of outcomes, including socio-economic status, academic achievement, health, and crime.

Most theories of racial difference can be divided into two categories: those that argue that racial differences are explained by socio-economic or so-called structural factors, and those that argue that there are inherent cultural differences between racial groups.[9] The key distinction is that, for the former, analyses of some outcome should be able to explain away racial differences if they include the right independent variables. For the latter, however, we would expect to always find racial differences, no matter how many factors are controlled for. This section is concerned with the latter, while the former is discussed in the next section.

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[9] There is a third category, which argues that racial disparities are the outcome of genetic differences. However, support for these theories is tenuous and in any case, this line of inquiry cannot be addressed here.

Cultural theories of race are applied to a wide range of outcomes, but they have in common an emphasis on historical and/or contemporary racial oppression. Differences in behavior are explained by cultural reactions to oppression. Some theories deemphasize reactions to oppression and focus more attention to the direct consequences of discrimination (e.g., Feagin, 1991, Dreeben and Gamoran, 1986). For example, Foster (1974) showed how white teachers would discipline black students for behaviors they did not understand and found threatening or disruptive. Other work examines the ways in which selection into both schools and academic tracks within schools block minorities from entering more nourishing intellectual environments. The application of discrimination arguments to bullying is tenuous however, because the discriminators are adult teachers and administrators while bullying occurs among peers, generally out of sight of adult authorities.

Other theories focus on cultural reactions to oppression. Many of these theories are used to explain differences in the academic performance of minorities, but are also applied to aggression and disruptive behavior. For example, Collins (1986) explains higher rates of crime among black males as claims of manhood intended to counteract their oppression by whites. Majors and Billson (1992) suggest that black males maintain a "cool pose" of aggression, nonchalance, and apathy which is a consequence of oppression and economic deprivation and a cause of academic failure and emotional isolation. Helms (1992) argues that some aspects of African-American culture, including greater emphasis on spirituality and measurement of time in terms of social events as opposed to days and hours, may inhibit academic achievement. Steele (1997) suggests that racial stereotypes contribute to the academic struggles of minorities.

Perhaps the most prominent and systematic cultural theory of the racial disparity, the oppositional culture hypothesis (Ogbu, 1991) distinguishes between voluntary (most immigrants) and involuntary (indigenous people, descendents of slaves) minorities, and suggests that African-American students, as a way of rejecting the institutions of the dominant race, will perform poorly, devalue education, and be disruptive in school, compared to Whites and voluntary minorities. A second aspect of this argument is that high-achieving African American students face sanctions from other African American students because they are "acting White" (Fordham and Ogbu, 1986).[10]

However, the oppositional culture hypothesis—which was founded on ethnographic research—has had mixed support in quantitative analysis. Researchers have found that found that African American students were no less attached to their schools than whites, and were significantly more engaged in school, and may that academic success may actually be rewarded by same-race peers (Johnson et al. 2001; Ainsworth-Darnell and Downey 1998; Kennedy, 1995). Some ethnographic research has also found scant support for the idea (Tyson, 2002; Tyson and Darrity, 2005). However, Griffin (2002), in a study of 130,000 students, found evidence of greater academic detachment among blacks and Latinos. Fryer and Torelli (2005) find that for blacks and Latinos, achievement is negatively related to popularity among peers of the same race. Ainsworth-Darnell and Downey found that African American students were significantly more disruptive and poorly behaved in class, as

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[10] While many scholars who accept arguments like those presented in *Cool Pose* simultaneously vehemently reject those of the oppositional culture hypothesis, which has become controversial (Ainsworth-Darnell and Downey, 1998), the two arguments have in common an emphasis on an internalized history of slavery, oppression, and discrimination, which becomes manifest in aggressive, disruptive and apathetic behavior.

measured by both self-reports and teacher ratings (1998). These last findings may be particularly relevant to bullying.

In any case, cultural theories all have in common a prediction that racial differences are an inherent product of culture and a history of oppression, and they predict an effect of race that is unmediated by other variables. They can be difficult to test in quantitative settings because while they can be readily disconfirmed with a non-significant race finding, a significant race effect may simply be the result of some omitted variable. This analysis will include a wide range of variables from multiple contexts, and if a race effect persists it would be consistent with cultural arguments but cannot confirm them.

IV. Criminological Theories

This dissertation considers four criminological theories that might predict bullying behavior, and perhaps explain racial differences therein. They are: strain theory, neighborhood disorder theory, social learning theory, and social control theory. Theories of strain focuses on structural disadvantage, placing emphasis on the socioeconomic desperation of many minorities, and particularly on the contexts in which they live and go to school (e.g., Wilson, 1996). Strain is created in that the underclass is inculcated with the materialistic values of the middle class, but denied legitimate means to achieve those ends (Merton,1938). Lacking legitimate access to economic rewards, impoverished, predominantly minority youth explore illegitimate means to attain those ends, resulting in deviant value systems that glorify toughness and violence (Cohen, 1955). Because they focus on socioeconomic circumstances, these arguments shift the locus of explanation away from race *per se*, suggesting that if

socioeconomic status is controlled for the effect of race should disappear. Some research has found that bullies and victims are more likely to have lower socioeconomic status, providing tacit support for strain theories (Wolke et al., 2001). It is important to note that while strain theories are general, they originated as explanations of urban pathology, so their application to rural settings may be imperfect.

The second criminological theory, social disorganization theory, has its origins in social ecology (Park and Burgess, 1924). Social disorganization proposes that population heterogeneity and population turnover weaken kinship and friendship ties in neighborhoods, undermining the community's ability to regulate itself and ultimately leading to increased crime (Shaw and McKay, 1969). Other research has supported these propositions, finding that neighborhoods with higher levels of social organization and systems of informal and formal control have lower crime rates and by extension, lower levels of delinquency (e.g., Bursik and Grasmick, 1995; Wilson and Kelling, 1982; Warner, 2003). Bursik (1986) found evidence of feedback between delinquency rates and racial composition changes in Chicago neighborhoods. The effect of delinquency rates on racial composition was stronger than the effect of racial composition change on delinquency, suggesting that much of the strong association between race and delinquency is driven by processes through which minorities become stranded in high-crime neighborhoods and lack the financial resources to leave. When it has been applied to bullying behavior, social disorganization theory has typically been supported (e.g., Espelage et al., 2000).

The third theory, social learning or differential association theory (Sutherland and Cressey, 1966; Akers, 1985) proposes that criminals are not fundamentally different than noncriminals, but instead learn their behaviors just as noncriminals do, through interaction in informal, small groups. Essentially, social learning theory suggests that birds that flock together grow the same feathers, that deviant behavior is spread through peer influence. Applied to bullying, this would suggest that adolescents who are friends with bullies, and particularly those who are exclusively friends with bullies, will eventually learn that behavior themselves.

Studies of elementary school children would appear to support differential association theory, in that they find that the peer group plays a significant role in reinforcing bullying. A study of Finnish elementary students found that bullying tended to occur in groups (Salmivalli et al., 1996), and a study of Canadian schoolchildren also found that the vast majority of bullying episodes involved multiple bullies who appeared to encourage each other (Craig & Pepler, 1997). Another recent study found that adolescents whose friends were bullies were significantly more likely to become bullies themselves (Mouttapa et al., 2004).

Another aspect of social learning theory concerns the home environment, and the bullying literature has paid close attention to family factors. Watson and Fischer (2002) found that children whose parents were aggressive or who used corporal punishment were more likely to become bullies. In a study of London school children, Smith and Myron-Wilson (1998) found that bullies rated their parents significantly lower on scales of warmth

and significantly higher on scales of neglect. Children with conflictive and physically punitive home lives are more likely to enact similar aggression in the peer context (Schwartz et al., 1997).

The fourth theory, Hirschi's social control theory (1969) is one of the most important and influential in all of criminology. It suggests that delinquents lack strong bonds to conventional society and are not socialized in ways that build self-control. Hirschi specified four dimensions to social control: *attachment* (caring about others, particularly conventional adults); *commitment* (personal investment in conventional behavior); *involvement* (time and effort put into conventional activities); and *belief* (in morality of conventional practices). It is worth noting that other theories, consciously or not, overlap with social control theory. Indeed, some of the mechanisms in the cultural theories of race discussed above, such as aloof detachment from peers, would qualify as social control. Additionally, while social disorganization theory is sometimes mistakenly interpreted as centered on SES, its core is the dissolution of the bonds that tie communities together and allow for self-regulation.

Hirschi's theory has been tested often, and is usually supported, with social control variables typically explaining between 25 and 50 percent of the variance in delinquency in cross-sectional analyses (Shoemaker, 1984). The theory is also supported in longitudinal analysis, though it is not always as strong (Longshore et al., 2005; Agnew, 1985). Some areas of Hirschi's theory are problematic, however. In practice, and perhaps conceptually, it is difficult to make clear distinctions between commitment and involvement (Foshee and Bauman, 1992). Additionally, in the face of compelling evidence from social learning

theory, Hirschi himself has abandoned the proposition that mere attachment to peers is preventative of delinquency (Gottfredson and Hirschi, 1990). While much of criminology has moved past the original social control theory, to the author's knowledge, it has never been systematically applied to school bullying. Because of this, it is worth testing its applicability to bullying before considering subsequent modifications of the theory.

V. Status Insecurity

Bullying prevention advocates often lament that teachers, parents and school administrators so often say, "it's all part of growing up," or "it's just normal teasing." Advocates legitimately dispute that behavior which can cause so much pain is within acceptable 2.limits. However, it would also be a mistake to view bullying solely as the province of delinquents and social isolates with bad home lives. As shown in chapter 1, there is evidence that bullying is fairly common behavior, not limited to a small subset of hardened deviants. If bullying is indeed "normal" (though reprehensible), and not deviant behavior, then this raises questions as to whether criminological theories will suffice to explain it.

One alternative is to consider a notion of insecurity. "Insecurity" is the catch-all popular explanation for a wide range of repugnant behavior, from cocktail party pomposity to mass murder. Most often, insecurity explanations are psychological, referring to some kind of personal inadequacy, manifested in a deep-seated need "to prove" something. However, for the study of bullying, it may prove useful to expand this commonsense notion of insecurity into sociological directions by developing the concept of status insecurity.

In addition to acne, rebelliousness, and monosyllabic replies at the dinner table, insecurity is a hallmark of adolescence, though this insecurity is somewhat different from that of cocktail party boors or overly competitive tennis players. The insecurity of the teenager is characterized by a sense of being on display, of being watched and judged by everyone. Arguably, it is driven both by a desire to be cool and by ambiguity as to their social status—child or adult, cool kid or nerd, etc. Here, the concept of status insecurity can be defined as stress concerning one's social status which is caused by either or both: a) pressure to gain (or maintain) high status; and b) ambiguity in terms of one's actual status.[11]

There are two reasons to expect status insecurity to increase bullying behavior. First, bullying is often not a dyadic interaction and there are usually multiple witnesses to bullying events (Craig and Pepler, 1997). Often the proximal objective of bullying is to humiliate for the purposes of entertainment. When the school nerd is shoved into his locker, the witnesses form an audience which may roar its approval. Becoming an entertainer in this way might enhance social status. But there are perhaps stronger, more direct motives: bullying others could resolve ambiguities as to the relative status of the bully and victim, and it could also, net of any entertainment value, enhance the bully's social status while diminishing the victim's. Openly bullying another student makes it evident to everyone that the bully is of higher social status than the victim, resolving any ambiguities concerning their relative status. Indirect bullying may not demonstrate status as clearly but may be more effective in enhancing status, at the expense of the victim. In any case, it is commonly assumed that

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[11] The concept is derived in part from Gould's (2003) argument that conflict is more likely to arise between people whose status vis-à-vis each other is ambiguous. The main differences are that here, ambiguity is generalized beyond dyadic comparisons to uncertainty as to one's place in a larger hierarchy; I also emphasize that people may feel different levels of pressure to attain or maintain high status.

bullies pick on other kids because they are not happy with themselves. It may be that they are happy with themselves, but not with their place in the social milieu.

The concept of status insecurity echoes Arendt: "every decrease in power is an open invitation to violence—if only because those who hold power and feel it slipping from their hands...have always found it difficult to resist the temptation to substitute violence for it" (1969, pp.87). The key difference, however, is that while the use of lethal violence by failing, corrupt regimes is never legitimate in the eyes of citizenry, bullying behavior may be, in the eyes of adolescents. So while power may never come out of the barrel of a gun, it remains to be seen whether status can be achieved by a wedgies, noogies, or gossip.

VI. Specific Research on School Bullying

The Psychology of Bullying

The bulk of the research on bullying has been done by psychologists, so much attention has been paid to its relationship with various mental states, most commonly self-esteem. With respect to bullies, the findings are mixed. Olweus (1993a), Bjorkqvist et al. (1982), Pearce and Thompson (1998), and Rigby and Slee (1992) found no significant differences in self-esteem between bullies and bystanders. Rigby and Slee (1992) even suggested that bullying enhances self-esteem, and Johnson and Lewis (1999) found that bullies had positive self-images and believed themselves to be likeable. Kaukiainen et al. (2002) found that bullying behavior was positively correlated with self-concept scores.

On the other hand, other researchers have found that bullies have significantly lower self-esteem than bystanders (see, for instance, Rigby and Cox, 1996; O'Moore and Hillery, 1991; O'Moore and Kirkham, 2001; Byrne, 1994). In addition to having lower global self-esteem, O'Moore and Kirkham (2001) found that bullies considered themselves to be more troublesome, have lower intelligence, to be less popular, and to be more unhappy. However, they were no different from bystanders with respect to feelings about physical appearance or anxiety. Austin and Joseph (1996) nearly replicated these findings, showing that bullies had lower global self worth, scholastic competence, social acceptance, and behavioral conduct, but were not significantly different in feelings about athletic competence or physical appearance. A study of depression also found that bullies were significantly more depressed than bystanders (Roland, 2002).

Physical Development

Another factor found to be important in predicting bullying is physical development. Olweus (1993) found that bullies tend to have entered puberty earlier and to be larger than their peers, particularly for boys. Olweus (1993) and Batsche and Knoff (1994) also found that male victims of bullying were smaller and weaker than their peers. Pubertal development could also explain some racial differences observed in bullying perpetration. There is some evidence that pubertal development also varies according to race, with children of African-American descent reaching puberty earlier, on average, than whites (Wu et al., 2002).

Social Networks

Only a few studies have been conducted using both complete social network data and involving middle school students as participants, which is the period when bullying is most intense (Elsea and Rees, 2001). Far from being outcasts, the literature has generally found that bullies are popular among their peers. One study found a high correlation between teacher's reports of student aggressiveness and student popularity (Rodkin et al., 2000; Rodkin et al., 2006). More recently, a study of primarily Latino or Asian 6th graders found that students whose friends were bullies were more likely to bully others, and that students who had more friends were less likely to be victimized (Mouttapa et al., 2004). Similarly, two studies have found used peer-nomination techniques and have found associations between bullying and popularity (Espelage and Holt 2001; Pelligrini et al., 1999).

Transitivity

Aside from the popular belief that bullies pick on kids because they themselves have been picked on, many researchers have found ample evidence that some bullies are also frequent victims (e.g., Kaukiainen et al., 2002; Olweus, 1999). Labeled "bully-victims," these pupils are often the worst off. While only a subset of bullies in school are also victims of their peers, it remains possible that even the "pure bullies" are victims, perhaps at the hands of older adolescents outside of school.

VII. Hypotheses

Based on cultural theories of race I hypothesize that

1) African-American, Latino, and other minority students bully more often than Whites.

Strain theories, social disorganization theory, and research on the socioeconomic disadvantages of minorities lead to the hypothesis that:

2) *Students from low SES backgrounds will be more likely to be bullies.*

3) *Students who live in neighborhoods with low organization and low social control are more likely to bully other students.*

One possible explanation for a black-white difference in bullying can be found in social control theory, suggesting the following hypotheses:

4) *Students with less attachment—measured by closeness to parents and friends and school attachment—are more likely to bully others.*

5) *Students with weak beliefs in conventional authority—measured by a conventional belief scale—are more likely to bully others.*

6) *Students with lower investment—measured by participation in extra-curricular activities—are more likely to bully others.*

7) *Students with lower levels of commitment—measured by perceived reactions of parents and friends to the student's use of marijuana—are more likely to bully others.*

Based on differential association or social learning theory, I expect

8) *Ego's bullying behavior will increase with mean bullying of alters.*

Based on existing research concerning parenting styles, self-esteem, pubertal development, and social networks, I hypothesize that:

9) *Family conflict will be positively related to bullying.*

10) *Students with more advanced pubertal development will be more likely to bully.*

11) *Depression is positively related to bullying.*

12) *Students who are picked on themselves will be more likely to bully others.*

13)Students who experience social insecurity will bully more often. Specifically, *a) those with ambiguous social status in the middle of the school hierarchy will bully others more often, as indicated by a positive main effect for popularity, but a negative squared term;* and *b) those who are under social pressure—who are surrounded by friends who consider themselves good looking and who place high importance on being popular—will bully others more often, net of their own values for these measures.*

VIII. Data and Methods: *The Contexts of Adolescent Substance Use*

The *Context of Adolescent Substance Use* study (hereafter, *Context*) is a longitudinal survey of all middle and high school students in three counties in North Carolina. The focus of *Context* is on alcohol, tobacco, and drug use, but it collects information on a wide range of other topics as well. The three counties were selected based on willingness to participate and proximity to Chapel Hill, North Carolina, where data collection and management occur. Unlike the Chapel Hill area, however, the participating counties are predominantly rural, with higher proportions of blacks and lower median incomes than national averages. The biannual in-school survey began in the spring of 2001 with wave 1; wave 5 data was collected in the spring of 2004. After wave 5, *Context* continued with two additional annual surveys, which means that the oldest cohort has been followed through high school.[12]

At wave 1, all public school students in grades 6, 7, and 8 for each county were asked to participate, resulting in over 5,000 participants divided among 29 networks. By wave 4 and 5, these 29 networks had been condensed into 19 school networks, as the students moved out of elementary and middle schools, and into high schools. The home addresses of all

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[12] Wave 6 was administered in the fall of 2004, wave 7 was administered in the fall of 2005.

students are geo-coded, allowing the study to link to powerful geographic datasets which provide important information about neighborhood setting. The response rate has been maintained at or above 80% for the first five waves of data, and above 75% for the final waves.

In addition to questions concerning substance use, aggressive behaviors, academic performance, depression, dating violence, school attachment, suicide attempts, physical development, family life, and neighborhood characteristics, the survey asks students to nominate up to five of their best friends. Beginning in waves 4 and 5, the survey adds questions asking students to nominate up to five students whom they "are mean to or pick on" and up to five students who are mean to or pick on the respondent. The survey also asks questions regarding the manner of bullying and the frequency with which it occurs. Accordingly, all analyses in this dissertation use data from waves 4 and 5.[13]

Dependent Variable

Research on bullying has tended to define it as "engaging in negative actions against a less powerful person repeatedly and over time" (Olweus, 1999; Kaukiainen et al., 2002). However, observing and measuring the relative power of schoolchildren is complicated, and in practice, the definition is circular—if someone is being repeatedly victimized, they are less powerful. Additionally, if one student harasses many other students, but only one time each, she would not be considered a bully by this definition. Accordingly, I abandon the relative power aspect of the definition, and focus instead on victimization. I also relax the

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[13] Later waves are not used because data were not cleaned at the time of writing, and the largest county dropped out of the study after wave 5.

requirement of repeated victimization, acknowledging that a bully may pick on other students regularly, but no single student on a frequent basis. Therefore, I define bullying as a situation, however brief, where a perpetrator harms a victim who is a peer, using physical (hitting, tripping, etc.), direct verbal (name-calling, threats of violence), or indirect (rumor-mongering, ostracism, etc.) aggression, and in a context of a continued relationship.

The dependent variable used in the analysis comes from the set of questions asking students to name up to five other students whom they pick on or are mean to, and those who are mean to or pick on them. Using social network analysis, I measure bullying with bullying outdegree, or simply the number of other students ego bullied.[14]

Independent variables

Race. Contexts asks students to report their race as one of the following categories: white, black or African-American, Hispanic or Latino, American Indian or Native American, Asian or Pacific Islander, Multiracial, or Other. For the purposes of this analysis, I use the categories white, African-American, Latino, and other minority.[15]

Parental Attachment. We calculate parental attachment for mother/stepmother and father/stepfather, using three separate items (asked about both parents): a) how often does he/she kiss or hug you? [a lot, some, not very much, never]; b) how close do you feel toward her/him? [very close, somewhat close, not very close, not close at all]; c) how close do you

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[14] I attempted to create a weighted outdegree, using estimates of the number of bullying events in the past three months, but creating reliable estimates out of categorical frequency responses and then reconciling these with the accounts of the other parties introduced too much error into the analysis, so I use outdegree.

[15] Other minorities are predominantly American Indians and multiracial students.

think she/he feels toward you? [very close, somewhat close, not very close, not close at all].

To address measurement error, I estimated a latent measurement model in MPLUS (RMSEA=0.039; CFI=0.976; TLI=0.970; SRMR=0.017), using the indicators of attachment for both mother and father combined (scaled to the closeness to mother item). I then output factor scores for use in the model.

Closeness to friends. For each of up to five friends each student can nominate, the respondent is asked how close he or she feels to each of them: very close (4), somewhat close (3), not very close (2), not close at all (1). The closeness to friends measure is an average of all closeness scores across all friends nominated. A second measure, reciprocated closeness, was created to reflect the attachment ego's, or the respondent's, friends feel toward ego. This was done by calculating the average closeness ego's friends felt toward ego. If a friend did not reciprocate, then the closeness score was counted as 0. The measure only counts those friends ego nominated.

Belief in conventional authority. This is comprised of the following four-point agree/disagree items: it is good to be honest; people should not cheat on tests; in general police deserve respect. The outcomes for all three are: strongly agree, agree somewhat, neither, disagree somewhat, and strongly disagree. I estimated a latent measurement model in MPLUS, using the three indicators (scaled to the honesty item). Again, model fit was good (RMSEA=0.010; CFI=0.998; TLI=0.997; SRMR=0.018), and factor scores from the measurement model are used in the analysis.

Investment. The measure of investment consists of the number of extra-curricular activities the student participates in. Students are asked whether they participate in each of the following types of activities: sports teams, service clubs, performance groups, school newspaper or yearbook, honor societies, or anti-drug use groups. Because each of these activities may have different implications for bullying, they are included as individual binary variables.

Commitment. Commitment is measured using the following questions, asked regarding the mother/stepmother, the father/stepfather, and "most of your friends": how do you think she/he/your friends would feel about you using marijuana or other drugs? The response categories are: like it a lot, like it some, dislike it some, dislike it a lot. Again, a latent measurement model was estimated in MPLUS and good fit statistics were obtained (RMSEA=0.018; CFI=0.977; TLI=0.972; SRMR=0.024). Factor scores from the measurement model were then included in the models below.

School attachment. School attachment is based on a scale developed by Roberts et al. (1995) and is measured by following three agree/disagree items: "students in this school treat each other with respect," students at this school are willing to go out of their way to help someone," and "my school is like a family." The response scale for all three items was a four-point agree/disagree scale. A latent variable measurement model was estimated in MPLUS (wave 4: RMSEA=0.018; CFI=0.989; TLI=0.975; SRMR=0.013) and factor scores included in this analysis.

Influence. The potential influence of friends is measured using the mean bullying outdegree of all of ego's friends. The few students who are isolates received a score of 0.

Socioeconomic status. Because the sample consists of adolescents who may not be fully aware of their family's financial position, SES of the family is measured using the educational attainment of both parents separately, with the following categories: did not graduate from high school; high school graduate; some college; college graduate; graduate degree. I also include the median income in the census tract in which the student resides.

Neighborhood Organization and Social Control. I measure neighborhood organization with the following agree/disagree items: "people sell illegal drugs in my neighborhood," "people are afraid to come into my neighborhood," "people there have violent arguments," and "people feel safe there" (reverse coded). Neighborhood social control is measured with the average of the following four-point agree/disagree statements: "most people there know each other," "adults keep an eye on what teens are up to," "people socialize together there," and "adults tell other parents if their child has done something bad." Both neighborhood disorder and social control were estimated separately as latent measurement models in MPLUS (neighborhood control: RMSEA=0.029; CFI=0.982; TLI=0.978; SRMR=0.045; neighborhood disorder: RMSEA=0.00; CFI=1.00; TLI=1.00; SRMR=0.001), and factor scores were output for use in the analysis.

Conflictive home lives. Family conflict is measured by the following three agree/disagree items: "we fight a lot in our family", "family members sometimes get so

angry they throw things," "family members sometimes hit each other." Again, a

measurement model was estimated in MPLUS (RMSEA=0.025; CFI=0.992; TLI=0.991;

SRMR=0.036) and factor scores are included in the models.

Puberty. Pubertal development is measured with the following items: "which best

describes your body hair growth?"; "which best describes the changes in your skin, such as

pimples?"; "Which of the following best describes your growth in height. For all items, the

response categories are (values in parentheses): not yet started; barely started; definitely

started; seems complete. Pubertal development was estimated as a latent measurement

model in MPLUS (RMSEA=0.018; CFI=0.985; TLI=0.982; SRMR=0.018) and factor scores

included in models below.

Depression. Depression is measured using the following three agree/disagree items

covering the past three months, all of which are reverse-coded: "I hated myself"; "I was a

bad person"; "I did everything wrong." The response scale for all three items was: "strongly

agree," "agree somewhat," "neither," "disagree somewhat," "strongly disagree." Once again,

a measurement model was estimated in MPLUS (RMSEA=0.008; CFI=0.999; TLI=0.999;

SRMR=0.020) and factor scores included in the analysis.

Popularity. Popularity is measured by first calculating normed betweenness centrality

in the friendship network, using UCINET (Borgatti et al., 2002). A geodesic is the shortest

possible path between any given pair of actors, and normed betweenness centrality is the

proportion of all geodesics in the network that include ego. So, a betweenness centrality of

.02 means that ego lies on 2 percent of all possible geodesics. However, because the survey limits the number of friendship nominations to five, mean betweenness centrality declines as the size of the network increases—it is easier to have normed betweenness of .20 in a network of 10 than in one of 100, particularly when the larger network is more sparse (due to the limit on nominations). To address this issue, I create a popularity percentile measure, whereby each students' betweenness is divided by the highest betweenness in their network, resulting in a measure that is comparable across networks.

Transitivity. Transitivity is defined as bullying indegree—or the number of students who pick on ego.

Status Insecurity. Status insecurity has two distinct dimensions. The first, ambiguity with respect to social rank, is difficult to measure with the survey items available. However, I attempt to approximate this idea by including squared popularity percentile in the model, with the expectation that it will have a negative effect—implying that those in the middle of the popularity spectrum will be most likely to bully, and those at the extremes the least likely.

The second dimension, social pressure, is measured using two items: friends' mean appearance and friend's importance of popularity. The subjective appearance measure is the simple average of two four-point agree/disagree items: "most of the time I am happy with the way I look" and "I am proud of my body." Importance of popularity is based on a single item, with four responses (ranging from not important to very important): "how important is

being popular to you?" The average appearance and importance of popularity scores are then calculated for all of ego's friends.

Control variables. In addition to race, I include sex, network size, age, and a binary indicator of whether the child lives in a one-parent home. I also include wave 4 bullying outdegree as a control variable.

Analysis Strategy

The Contexts sample includes two levels: the individual student and the school. Because students in the same school, or in the same neighborhood, may share the same unobserved characteristics, I estimate a cross-classified hierarchical linear model, which allows for a randomly distributed school and neighborhood intercepts. I use multiple imputation to address missing data, generating five imputed datasets. The model estimated is a residualized gain model, where the effect of wave 4 bullying outdegree is controlled for. By controlling for wave 4 bullying, we are able to test the effect of other independent variables on change in the outcome from wave 4 to wave 5. The model (using parental attachment as an example) is specified as follows:

Level 1:

$$Y_{ij} = \beta_{0j} + \beta_{0k} + \beta_1 (\text{Wave4 Outdegree})_{ij} + \beta_2 (\text{Network Size})_{ij} + \beta_3 (\text{Male})_{ij} + \beta_4 (\text{Black})_{ij} + \beta_5 (\text{Latino})_{ij}$$
$$+ \beta_6 (\text{Other Minority})_{ij} + \beta_7 (\text{One parent home})_{ij} + \beta_8 (\text{Age})_{ij} + \beta_9 (\text{Parent Attachment})_{ij} + r_{ij}$$

Level 2 Intercepts:

$$\beta_{0j} = \gamma_{00} + u_{0j}$$

$$\beta_{0k} = \gamma_{01} + u_{0k}$$

Combined Model:

$$Y_{ij} = \gamma_{00} + \gamma_{01} + \beta_1 (\text{Wave4 Outdegree})_{ij} + \beta_2 (\text{Network Size})_{ij} + \beta_3 (\text{Male})_{ij} + \beta_4 (\text{Black})_{ij} + \beta_5 (\text{Latino})_{ij}$$
$$+ \beta_6 (\text{Other Minority})_{ij} + \beta_7 (\text{One parent home})_{ij} + \beta_8 (\text{Age})_{ij} + \beta_9 (\text{Parent Attachment})_{ij} + u_{0j} + u_{0k} + r_{ij}$$

where Y_{ij} is wave 5 bullying outdegree, γ_{00} and γ_{01} are random intercepts at the school and neighborhood levels, respectively, β_{0j} is an individual intercept, β_1 - β_9 are coefficients for independent variables at the individual level, u_{0j} and u_{0k} are randomly distributed error terms at the school and neighborhood levels, and r_{ij} is a random individual error term.[16]

IX. Results

Descriptive statistics for the dependent and independent are presented in table 2.1. It is not necessary to discuss all the summary statistics, but it is worth noting that bullying appears to have declined from wave 4, in the fall of 2003 (.77) to wave 5 (.63) in the spring of 2004. It cannot be ascertained exactly why bullying declines between waves. However, the beginning of the school year is a time of some transition and status hierarchies might be more fluid at that time compared to the end of the year, which may lead to increased bullying in the fall.

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[16] Because the distribution of bullying outdegree involves a large proportion of students with scores of 0, it might also be legitimately considered count data rather than a truly continuous variable. Accordingly, I estimated cross classified mixed models using the proc glimmix option in SAS with a poisson distribution. The results were substantively identical to those presented below, and so I use the linear model for ease of interpretation.

Table 2.2 displays the results from the cross-classified HLM. Model 1 shows the baseline model, including only controls. Wave 4 bullying is, not surprisingly, positively related to wave 5 bullying. Network size apparently is unrelated to bullying outdegree. Contrary to expectations, there are no significant gender differences in bullying behavior, there is no decline in bullying with age, and children living in single-parent households pick on *fewer* kids than those with two parents. Model 1 also largely confirms the first hypothesis, that minorities bully others more often: compared to Whites, mean bullying outdegree for Blacks and Latinos is .10 and .27 higher, respectively. There is no significant difference between Whites and "other" minorities, however. The substance of these control variables remains unchanged across the other models, so I do not discuss them again in this section.

Table 2.1: Descriptive Statistics

	Mean	S. E	Min	Max
Wave 5 bullying outdegree	0.63	1.18	0.00	8.00
Wave 4 bullying outdegree	0.77	1.30	0.00	9.00
Wave 4 bullying indegree	0.79	1.49	0.00	17.00
School size	571.37	304.69	21.00	1564.00
Male	0.49	0.50	0.00	1.00
Black	0.35	0.48	0.00	1.00
Latino	0.04	0.19	0.00	1.00
Other minority	0.07	0.24	0.00	1.00
One parent household	0.13	0.30	0.00	1.00
Age	14.60	1.04	12.00	18.00
Mother's education	2.22	1.49	0.00	5.00
Father's education	2.00	1.55	0.00	5.00
Median household income in block group	37.28	10.74	-12.58	83.96
Neighborhood disorder	-0.02	0.32	-1.19	1.31
Neighborhood control	-0.02	0.65	-2.57	2.29
Average closeness alters feel toward ego	1.99	1.52	0.00	5.00
Average closeness ego feels toward alters	1.26	1.03	-2.50	6.00
Attachment to parents	0.00	0.25	-1.02	0.91
Attachment to school	-1.29	1.23	-5.28	3.08
Friends and family would disapprove of ego's marijuana use	0.02	0.35	-0.21	2.43
Participates in sports	0.54	0.48	0.00	1.00
Participates in service clubs	0.32	0.44	0.00	1.00
Participates in arts	0.09	0.25	0.00	1.00
Participates in yearbook/newspaper	-0.02	0.58	-2.60	1.92
Participates in honors societies	0.80	0.72	0.00	7.00
Participates in DARE	0.04	1.00	-4.24	4.99
Pubertal development	0.00	0.31	-1.54	1.21
Depression	0.02	1.17	-4.32	4.73
Betweenness centrality (percentile)	12.70	16.75	0.00	100.00
Happy with appearance	2.27	0.80	0.00	3.00
Importance of being popular	1.55	1.07	0.00	3.00

N=4,771

Model 2 tests the second hypothesis, that lower socioeconomic status is positively related to bullying, and might explain the significant racial differences. However, none of the socioeconomic status variables are significant. I also estimated models where parents' educational attainment was entered as a series of indicator variables, but none were significant. Lastly, I tested a number of other block group variables, including percent under

poverty, percent unemployed, percent owning a home, and median home value, but again, none were significantly related to bullying.

Model 3 tests the third hypothesis, that students who live in neighborhoods that are crime-ridden and chaotic bully others more often, while those who live in orderly neighborhoods with high levels of social control do not. As with SES, however, neither of these factors is significant.

Models 4 through 6 test hypothesis 4, that kids with higher levels of attachment—to their friends, to their parents, and to school—pick on other kids less often. While neither measure of peer attachment is significant, both attachment to parents and to school have a significant protective effect against bullying. It makes sense that attachment to parents and school is protective while peer attachment is not, as parents and schools are presumably conventional role models and institutions, while peers may or may not be positive influences with regard to bullying.

Models 7 through 9 test other aspects of Hirschi's social bonding theory. Model 7 tests hypothesis 5, that kids who hold conventional beliefs will bully less often, and shows that conventional beliefs do appear to have a protective effect with respect to bullying. Participation in extra-curricular activities (model 8), however, has mixed results: yearbook/school newspaper, the arts, and honors societies do not significantly affect bullying behavior, participation in drug awareness societies like DARE significantly reduces bullying, but participation in sports and service clubs (key club, etc.) are *positively* related to

bullying.[17] Finally, there appears to be no relationship between bullying and Hirschi's notion of commitment—here operationalized as the student's perceptions of how parents and friends would react if they found the student smoking marijuana.

Model 10 shifts focus from social bonding theory to social learning, and confirms hypothesis 8. Kids whose friends are bullies are themselves more likely to bully others. Of course, it is impossible to determine whether this is indicative of influence or selection, but other research (unpublished) with these data suggest that both are at work. It is also important not to overstate the effect of friends' bullying: to generate a predicted change in bullying of 1 would necessitate that ego's friends picked on 10 other kids, on average. Model 11 tests a second aspect of social learning theory by examining the effect of having a conflictive home life, and again finds a significant positive effect on bullying. Neither variable, however, can explain away racial differences in bullying.

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[17] But perhaps this comes at no surprise to those who can recall grade-school PE classes.

Table 2.2: Cross-Classified HLM Models of Bullying Outdegree

	1. Baseline		2. SES		3. Neighborhood		4. Peer Attachment		5. Parent Attachment	
	β	SE	β	SE	β	SE	β	SE	β	SE
Intercept	0.88 **	0.30	0.94 **	0.31	0.98 **	0.30	0.90 **	0.30	0.97 **	0.30
Wave 4 bullying	0.32 ***	0.01	0.32 ***	0.01	0.31 ***	0.01	0.32 ***	0.01	0.31 ***	0.01
Network size	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Male	-0.02	0.03	-0.02	0.03	-0.02	0.03	-0.02	0.03	0.00	0.03
Black	0.10 *	0.04	0.09 *	0.04	0.09 *	0.04	0.10 *	0.04	0.11 **	0.04
Latino	0.27 **	0.09	0.29 ***	0.09	0.26 **	0.09	0.27 **	0.09	0.26 **	0.09
Other minority	-0.06	0.07	-0.06	0.07	-0.08	0.07	-0.06	0.07	-0.06	0.07
One parent home	-0.15 **	0.06	-0.14 *	0.06	-0.16 **	0.06	-0.15 **	0.06	-0.15 **	0.06
Age	-0.03	0.02	-0.03	0.02	-0.03	0.02	-0.03	0.02	-0.03	0.02
Mother's education			0.03	0.02						
Father's education			-0.01	0.01						
Median income in block group			-0.004	0.00						
Neighborhood disorder					-0.12	0.06				
Neighborhood control					-0.04	0.03				
Reciprocated closeness							0.00	0.01		
Average closeness to friends							-0.02	0.02		
Attachment to parents									-0.24 **	0.08
School Random intercept	0.013	0.007	0.013	0.007	0.013	0.007	0.012	0.007	0.012	0.007
Neighborhood random intercept	0.008	0.005	0.008	0.005	0.008	0.005	0.008	0.005	0.009	0.005

N=4,771

^.<.05, one-tail test; *p<.05; **p<.01; ***p<.001

Table 2.2, Continued: Cross-Classified HLM Models of Bullying Outdegree

	6. School Attachment		7. Beliefs		8. Activities		9. Disap. Marijuana		10. Friends who Bully	
	β	SE	β	SE	β	SE	β	SE	β	SE
Intercept	0.84 **	0.30	0.92 **	0.30	0.76 *	0.30	0.96 **	0.31	0.80 **	0.30
Wave 4 bullying	0.32 ***	0.01	0.31 ***	0.01	0.32 ***	0.01	0.31 ***	0.01	0.31 ***	0.01
Network size	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Male	-0.01	0.03	-0.04	0.03	-0.01	0.03	-0.02	0.04	-0.02	0.03
Black	0.10 **	0.04	0.10 *	0.04	0.11 **	0.04	0.10 *	0.04	0.10 *	0.04
Latino	0.28 ***	0.09	0.25 **	0.09	0.29 ***	0.09	0.24 **	0.09	0.27 **	0.09
Other minority	-0.06	0.07	-0.06	0.07	-0.05	0.07	-0.05	0.08	-0.06	0.07
One parent home	-0.15 **	0.06	-0.17 **	0.06	-0.14 *	0.06	-0.16 **	0.06	-0.15 **	0.06
Age	-0.03	0.02	-0.03	0.02	-0.02	0.02	-0.03	0.02	-0.03	0.02
School attachment	**-0.03** ^	0.01								
Conventional beliefs			**-0.11** ***	0.03						
Sports					**0.06** ^	0.04				
Service clubs					**0.11** *	0.04				
Arts					0.03	0.05				
Yearbook					0.08	0.06				
Honors societies					-0.04	0.05				
DARE					**-0.16** *	0.07				
Friends & family disapprove of marijuana							0.08	0.05		
Average bullying of friends									**0.07** **	0.02
School Random intercept	0.013	0.007	0.012	0.007	0.012	0.007	0.013	0.007	0.011	0.007
Neighborhood random intercept	0.008	0.005	0.009	0.005	0.008	0.005	0.010	0.006	0.008	0.005
N=4,771										

^.<.05, one-tail test; *p<.05; **p<.01; ***p<.001

53

Table 2.2, Continued: Cross-Classified HLM Models of Bullying Outdegree

	11. Family Conflict		12. Puberty		13. Depression		14. Victimization	
	β	SE	β	SE	β	SE	β	SE
Intercept	0.94 **	0.30	0.90 **	0.30	0.93 **	0.30	0.81 **	0.30
Wave 4 bullying	0.31 ***	0.01	0.32 ***	0.01	0.31 ***	0.01	0.30 ***	0.01
Network size	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Male	-0.02	0.03	-0.02	0.03	-0.02	0.03	-0.01	0.03
Black	0.10 *	0.04	0.10 **	0.04	0.11 **	0.04	0.11 **	0.04
Latino	0.27 **	0.09	0.28 **	0.09	0.27 **	0.09	0.28 **	0.09
Other minority	-0.06	0.07	-0.06	0.07	-0.06	0.07	-0.05	0.07
One parent home	-0.17 **	0.06	-0.15 **	0.06	-0.16 **	0.06	-0.15 **	0.06
Age	-0.03	0.02	-0.03	0.02	-0.03	0.02	-0.03	0.02
Family conflict	**0.04** *	0.02						
Pubertal development			0.03	0.06				
Depression					**0.04** *	0.02		
Bullying indegree							**0.06** ***	0.01
School Random intercept	0.012	0.007	0.012	0.007	0.012	0.007	0.012	0.007
Neighborhood random intercept	0.008	0.005	0.008	0.005	0.008	0.005	0.008	0.005
N=4,771								

^.<.05, one-tail test; *p<.05; **p<.01; ***p<.001

Table 2.2, Continued: Cross-Classified HLM Models of Bullying Outdegree

	15. Popularity		16. Appearance		17. Importance of Popularity	
	β	SE	β	SE	β	SE
Intercept	0.70 *	0.30	0.87 **	0.30	0.71 *	0.30
Wave 4 bullying	0.31 ***	0.01	0.32 ***	0.01	0.31 ***	0.01
Network size	0.00	0.00	0.00	0.00	0.00	0.00
Male	-0.01	0.03	0.00	0.03	-0.03	0.03
Black	0.11 **	0.04	0.11 **	0.04	0.09 *	0.04
Latino	0.27 ***	0.09	0.27 **	0.08	0.28 ***	0.09
Other minority	-0.05	0.07	-0.05	0.07	-0.05	0.07
One parent home	-0.14 *	0.06	-0.15 *	0.06	-0.14 *	0.06
Age	-0.02	0.02	-0.02	0.02	-0.02	0.02
Centrality	**0.008** ***	0.00				
Centrality squared	**-0.0001** **	0.00				
Happy with appearance			**-0.06** **	0.02		
Friends happy with their appearance			**0.04** *	0.02		
Importance of being popular					0.02	0.02
Friends' importance of being popular					**0.04** *	0.02
School Random intercept	0.012	0.007	0.012	0.01	0.012	0.01
Neighborhood random intercept	0.008	0.005	0.007	0.00	0.007	0.00
N=4,771						

^.<.05, one-tail test; *p<.05; **p<.01; ***p<.001

Models 12 through 14 test the effects of factors other bullying research has shown to be related. Pubertal development (model 12), so often cited in the literature, is not significantly related to bullying here. To test whether this might be because pubertal development operates more strongly or exclusively for boys, I tested this model with an interaction between male and pubertal development (not shown), but again neither were significant. Depression (model 13), however, is significantly related to bullying in a positive direction. Lastly, in model 14 we consider transitivity, the idea that those who are picked on are more likely to pick on others themselves. Bullying indegree is positively related to bullying outdegree, confirming the presence of at least some bully-victims in this sample.

Finally, I consider hypotheses derived from the concept of status insecurity. Model 15 tests—albeit indirectly—the notion of ambiguity with respect to social status. Again, I anticipate those in the middle of the school's social hierarchy to experience more ambiguity than those at either extreme. We find that popularity does indeed have a curvilinear effect, with a positive main coefficient and a negative squared term. This effect can be seen readily in Figure 1, which shows that the effect of popularity on bullying peaks in the middle percentiles, with those who are either very popular or very isolated both being unlikely to bully others.

Figure 1: Predicted Effect of Popularity on Bullying Outdegree
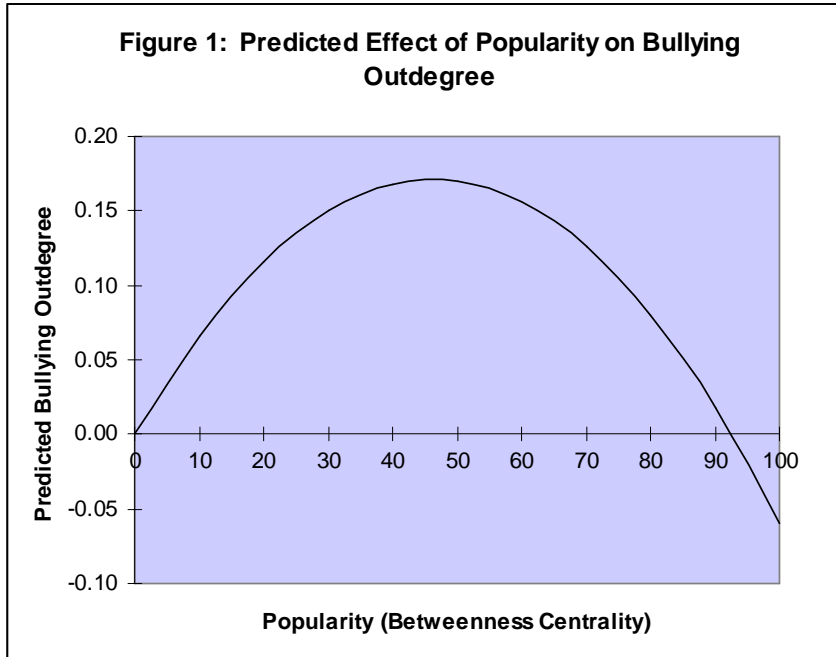
Models 16 and 17 test the other dimension of the status insecurity concept, that of social pressure. I operationalize this by including the effect of having good looking friends and friends who placed high importance on being popular.[18] Model 16 shows that, indeed, while being attractive *decreases* one's propensity to bully, having attractive friends does the opposite. Similarly, while the importance a student places on being popular is not significantly related to bullying behavior, having *friends* who find being popular to be important increases bullying significantly.

Table 2.3 displays results from a combined model that includes all significant independent variables from table 2.2. Several variables lose significance in the combined model. School attachment, family conflict, depression, friends' appearance, respondent's

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[18] Of course, the measures of appearance are based on the respondent's own perceptions, so it is possible that actual appearance is not measured. Still, it may not matter for this analysis: more pressure might be generated by friends who think they are attractive when they are not, compared to having attractive friends who think they are average.

appearance, and friends' importance of popularity all lose significance. It seems likely that the effects of school attachment may be mediated in part by extracurricular activities or popularity, and it is also probable that the status insecurity variables are also related to popularity. We continue to find that attachment to parents and conventional beliefs prevent bullying while sports and service clubs encourage it. We also find that bullying indegree and the mean bullying outdegree of friends are strong predictors of bullying. Finally, we continue to find a strong curvilinear popularity effect.

Table 2.3: Full Cross-Classified HLM Model of Bullying Outdegree

	β	SE
Intercept	0.50	0.302
Wave 4 bullying	0.28 ***	0.013
Network size	0.00	0.000
Male	0.01	0.035
Black	0.13 ***	0.039
Latino	0.26 **	0.084
Other minority	-0.06	0.070
One parent home	-0.16 **	0.059
Age	-0.02	0.021
Parent attachment	-0.18 *	0.076
School attachment	-0.01	0.014
Sports	0.07 ^	0.036
Service clubs	0.12 **	0.041
DARE	-0.13 ^	0.066
Conventional beliefs	-0.09 **	0.033
Mean bullying of friends	0.05 *	0.024
Family conflict	0.01	0.019
Depression	0.01	0.016
Centrality	0.01 **	0.002
Centrality squared	-0.0001 *	0.000
Bullying indegree	0.05 ***	0.011
Happy with appearance	-0.03	0.025
Friends happy with their appearance	0.01	0.031
Importance of being popular	0.02	0.016
Friends' importance of being popular	0.02	0.039
School Random intercept	0.010	0.006
Neighborhood random intercept	0.007	0.005
N=4,771		

^.<.05, one-tail test; *p<.05; **p<.01; ***p<.001

Measurement Error

Because factor scores may contain measurement error, I estimated models with adjusted factors. First, the reliability of the simple sum of the indicators was calculated, as follows:

$$R = \frac{(\sum_{j=1}^{l} \lambda_j)^2 (\sigma_f^2)}{\sum_{j=1}^{l} \lambda_j)^2 (\sigma_f^2) + \sum_{j=1}^{k} \sigma_{ej}^2}$$

where R=the reliability of the simple sum, λ_j is the factor loading for the jth indicator, σ_f^2 is the factor variance, and σ_{ej}^2 are the error variances. Reliabilities are reported in table 2.2. To correct for the error variance in the simple sum scale, I first need to determine its error variance, which is

$$\sigma_e^2 = (1-R)^* \ \sigma_s^2$$

where σ_e^2 is the error variance of the simple summed scale, R is the reliability of the simple summed scale, and σ_s^2 is the variance of the scale. Finally, a latent variable is included in my SEM and scaled to the summed scale and the error variance of it is set to the error variance calculated above.

Table 2.4: Scale Reliability

Scale	Reliability
Conventional beliefs	0.76
Depression	0.92
Disapprove of marijuana use	0.22
Family conflict	0.87
Neighborhood control	0.77
Neighborhood disorder	0.85
Parent attachment	0.81
Pubertal development	0.61
School attachment	0.91

Results

In general, most findings from tables 2 and 3 are unaffected by this adjustment. For all models, no variable that was significant in the original tables became significant after adjusting for measurement error. There were only two minor changes: in table 2.2, depression and family conflict both dropped from significant at the .05 level to significant at the .10 level; however, because both coefficients are in the hypothesized direction, they support a one-tail significance test at the .05 level. However, this exercise reveals that there is some measurement error, and that the effects of family conflict and depression on bullying should be interpreted with caution.

X. Discussion and Conclusions

This paper has applied five different theories to school bullying. First, *African Americans and Latinos are significantly more aggressive toward their peers than are whites, and that this difference cannot be explained by any of the wide range of variables included in this analysis*. While a direct test was not possible, these findings are consistent with cultural theories of racial differences, in that the race effect could not be explained away by low SES, family conflict, or neighborhood disorder. However, the race effect also could not be explained away by low school attachment or conventional beliefs, mechanisms that are common to some cultural arguments. Because of this, these findings cannot be interpreted as confirming these cultural theories, as there are too many potentially explanatory variables that could not be included.

One likely explanation of the racial difference is based on the idea of bullying as *instrumental* behavior, rather than an emotionally-based cultural reaction to a history of oppression. Other analysis of these data (Chapter 3) finds that, while bullying others increases the bully's popularity in general, African-Americans and other minorities experience much greater benefits to bullying. In fact, the magnitude of difference between blacks and whites in the popularity benefit to bullying is much greater than the magnitude of the race effect found here.

Of the criminological theories, the application of theories of strain and neighborhood disorder to bullying is not supported by this analysis. Social control theories suggest that detachment from parents, peers, school, and the broader community will lead to crime, and by extension, bullying. We find that, while attachment to peers and collective disapproval of marijuana are unrelated to bullying and extracurricular activities offer mixed results, *closeness to family, school attachment, and believing in conventional values all make bullying less likely*.

Social learning theory suggests that delinquency is learned from peers and, occasionally, family. We find that *having friends who bully and living in a conflictive household are both positively related to bullying*. Other, more specific findings cataloged in the bullying literature are also supported, as *depression and being picked on are both positively related to bullying others*. These results would suggest that bullying can be understood as just one more facet of delinquency: bullies are detached from family and

school, they have conflicted home lives and mean friends, they are depressed and themselves abused. Indeed, much of the bullying literature views it in this light.

This perspective misses an important aspect of bullying, that it is often perpetrated by seemingly "normal" students, who are relatively popular, have attractive friends, and are active in their school. These students may earn good grades and come from educated, financially secure families living in nice neighborhoods. *What they appear to have in common is some degree of status insecurity, which is positively related to bullying*. They are in the middle range of the popularity distribution, so their status has greater ambiguity that of either the most popular or the least. They also have friends who are attractive and who place great emphasis on being popular, potentially creating pressure to attain or maintain high social status.

This study makes several key contributions to our understanding of peer aggression. First, it introduces a new way to measure bullying, using social network analysis. The network generator used preserves the general nature of bullying, including physical violence, verbal abuse, and indirect forms of aggression. It is likely because of this that we do not find significant gender differences in perpetration, commonly found in studies that focus on physical bullying. The network approach is also an improvement because it mitigates underreporting bias. Indeed, we find that rates of self-reported aggression are much lower than those for the network-based measure. Finally, while this analysis considers bullying from a monadic perspective, the network approach preserves the relational nature of bullying, and allows the researcher to consider bullying from either a monadic or dyadic perspective.

Second, this analysis proposes, and finds support for, the concept of status insecurity. That seemingly normal kids also bully their peers is a novel finding within the bullying literature, which typically reports that deviant youths are bullies, or occasionally, that the most popular students are the perpetrators (e.g., Olweus, 1993; Espelage and Holt, 2001). In this analysis, we find that the most popular students have the *lowest* levels of bullying, on average. Similarly, while this analysis supports earlier findings of homophily among bullies,[19] it extends our understanding of social influences by considering not just the aggressive behaviors of friends, but their appearance and the value they place on popularity as well. Future research should consider other ways in which ego's behavior can be influenced by alters' behavior in seemingly unrelated domains.

The third contribution is, in a sense, a failure: one of the stated aims of this paper was to explain racial differences in bullying perpetration by considering a wide range of variables. We are unable to explain higher levels of bullying perpetration by African-Americans and Latinos, despite inclusion of variables covering a wide range of theoretical domains, from SES to the influence of aggressive peers, and a variety of contexts, from the psychology of the individual to the characteristics of the neighborhood. There are undoubtedly a number of explanations that could not be tested, and we cannot conclude definitively that higher rates of bullying among minorities is not mediated by other factors.

While a persistent race effect is consistent with cultural arguments about race, some of the common mechanisms of these arguments, reduced school attachment and rejection of conventional beliefs, not only could not explain away the race effect, but the failed to reduce

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[19] The finding that bullies tend to be friends with other bullies (Espelage et al., 2003).

its magnitude at all. Additionally, other analysis finds that African-American and other minority bullies enjoy especially large status gains as a result of bullying. This suggests a fairly simple, instrumental reason for the racial differences, but it also raises the question of why minorities see greater status increases after bullying others.

There are limitations to this study, chief among them its geographic limitations. The sample comes from three largely rural counties in North Carolina, and so it may not be possible to generalize readily to other areas of the country. Additionally, factors such as neighborhood disorder may operate differently in urban environments. Also, while the study spans middle school and high school, it may not generalize to earlier ages. However, many of the above findings are consistent with prior research, suggesting that the processes involved may be similar across contexts. In any case, it is hoped that this analysis will lead to continued exploration of the role of race, further investigation of the idea of status insecurity, and greater use of social network analysis in the study of bullying.

CHAPTER 3

THE CONSEQUENCES OF BULLYING: VARIATIONS BY RACE AND ETHNICITY

I. Introduction

Bullying is a common problem in the United States. One nationally-representative

study found that over 19 percent of American school-aged students bully other students

annually, and 17 percent are victimized and nearly half of the victims were bullied on a

weekly basis (Nansel et al., 2001). A different national study found that annual prevalence of

perpetration was as high as one-third of all students (Finkelhor and Dziuba-Leatherman,

1994). Observational results suggest self-reported involvement in bullying may actually

understate the true prevalence: one study used a hidden camera on a playground to observe

the phenomenon, and found an episode of bullying approximately every eight minutes, and

the majority of these involved multiple bullies (Knopp, 2002). A study of high school

students found that the majority perceive bullying to be a significant and widespread problem

(Hazler et al., 1991) and nationally, bullying ranks higher than racism, AIDS, or substance

use among students aged 8 to 15 (Acre, 2001).

Bullying is troubling not simply because of its frequency, but also because of the

severity of its consequences. The spate of highly publicized school shootings in the late

1990's brought the problem of bullying to attention of educators, policy makers, and the

general public. The US Secret Service found that bullying played a significant role in the majority of the school shootings of the 1990's (US Secret Service, 2000). The dangers of chronic victimization are not media creations, nor limited to the US context: a study of multiple countries consistently found that both bullies *and* victims[20] are significantly more likely to carry weapons (Nansel et al., 2004).

However, by focusing on the rare instances where victims shoot their tormentors, this coverage understates the perniciousness of bullying-related violence. As discussed below, bullying has a wide range of negative consequences, for bullies as well as victims. Many of these outcomes have been well established with multiple studies in varying contexts. However, while it is known that bullying often involves racist teasing—fully one-quarter of bullied students were overtly picked on because of their race or religion (Nansel et al., 2001)—and that there may be racial differences in both perpetration and victimization (e.g., Graham and Juvonen, 2002; Nansel et al., 2001), relatively little is known about the other ways race and ethnicity shape bullying processes, and how the consequences may vary by race or ethnicity.

The purpose of this paper, therefore, is to reexamine five established outcomes of bullying—self esteem, anxiety, school attachment, popularity, and suicide attempts—and to test whether the relationships between involvement in bullying (either as bully or victim) and these outcomes vary according to the race of the individual or the racial context of the school.

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[20] Victims were significantly more likely to carry weapons than uninvolved students in all but two of the countries studied.

The chapter proceeds as follows: section II reviews the literature on the outcomes of bullying; section III reviews the literature on race and bullying; section IV presents hypotheses; section V describes the data and methods; section VI presents the results; and section VII draws conclusions.

II. Literature Review: The Consequences of Bullying

As noted above, chronic bullying has been linked to the majority of the publicized school shootings of the late 1990's. However, when victims do become violent, it is most often directed at themselves, not classmates: "for every adolescent who opened fire at schools from West Paducah, KY, to Springfield, OR, in the past few years, thousands more shot themselves, slit their wrists, or gulped down pills in suicides" (Portner, 2000, p.1). A message board poster on a bullying support website said:

> Two of the worst bullies I had to contend with committed suicide…I have been battling suicidal tendencies myself since that time (thirty-odd years ago.) Knowing personally what it's like to want to die, I can only say their torture was well-merited and I'm glad they suffered. And I'm glad they're dead.
> --posted on www.bullying.org).

Suicide is the third leading cause of death among teenagers, is significantly underreported, and is on the rise (Portner, 2000). Being victimized by bullies is significantly positively related to suicidal ideation (Rigby and Slee, 1999, Kaltiala-Heino et al., 1999; Carney, 2000; Owens et al., 2000). Additionally, being bullied may have an indirect effect on suicidal thoughts by increasing social isolation (Nansel et al., 2001) which in turn has also been found to be significantly related to suicidality, particularly among girls (Bearman and Moody, 2004).

Aside from such dire consequences, more often victims of bullying experience feelings of isolation, anxiety and depression, and these feelings can last well into adulthood (Schafer et al., 2004; Olweus, 1993). To the author's knowledge, every study of victimization and depression has supported the link between them (e.g., Callagan and Joseph, 1995; Neary and Joseph, 1994; Baldry, 2004; Dill et al., 2004). Similarly, every study of victimization and self-esteem has found that victims of bullying experience lower levels of self-esteem than bullies or other students (e.g., Olweus, 1993; O'Moore and Kirkham, 2001; Karatzias et al., 2002). Victims of bullying, particularly those who experience frequent and enduring bullying, also have elevated levels of stress and anxiety (Sharp et al., 2000; Baldry, 2004).

In addition to psychological damage, bullying can also lead to health problems. A nationally representative study of US adolescent females found a relationship between bullying and a variety of health indicators. Compared to girls who were not bullied frequently, girls who were bullied at least once a week were 40 percent more likely to experience headaches, 20 percent more likely to experience stomachaches, 30 percent more likely to experience backaches, and 30 percent more likely to feel fatigued in the morning (Ghandour et al., 2004). At least one other study has found similar results for these outcomes, while also finding that victimization is related to sleep problems and bedwetting (Rigby, 1999).

Not surprisingly, victimization by bullies is associated with other social problems. Victims of bullying can fall into a vicious cycle of peer withdrawal followed by victimization followed by further peer withdrawal (Hay et al., 2004; Hodges and Perry, 1999). One study

68

found that victimization by peers was significantly related to loneliness one year later (Boivin et al., 1995, cited in Dill et al., 2004). Another longitudinal study that followed up on victims one year later also found lasting negative effects on victims' self-perceptions of popularity (Khatri et al., 2000). A retrospective study of the adults found that those who had been victimized by peers during adolescence were significantly more likely to feel lonely and have difficulty maintaining friendships (Schafer et al., 2004).

These findings are not limited to any particular national context: a recent cross-national study including 25 countries found that victims had significantly greater problems with social adjustment than their peers (Nansel et al., 2004). Another cross-national study (including data from seven countries) conducted by Eslea et al. (2003) found that compared to bullies and uninvolved students, victims enjoy playtime less, are more often isolated during playtime, have fewer friends, and feel less well-liked.

Bullying has academic consequences as well. Victims of bullying are significantly more likely to want to stay home from school, attitudes that can impede academic performance (Berthold and Hoover, 2000). Victims were less likely to feel that "people at this school care about me", and more likely to feel that school is difficult and to feel afraid at school (Bertold and Hoover, 2000). Again, these findings are general: a cross-national study involving 25 countries found that, for every country studied, victims of bullying have significantly more problems adjusting to school than do uninvolved students (Nansel et al., 2004).

The academic consequences of bullying are not only attitudinal, however, as surveys by the National Education Association found that approximately 160,000 children in the U.S. miss school *each day* out of fear of being attacked or intimidated by other students, and about 7% of eighth-graders in the U.S. stay home at least once a month because of bullies (NEA, 1995). In terms of actual academic performance, a longitudinal study found that victims of relational bullying (bullying designed to isolate and ostracize, using behind-the-back tactics such as rumors) had significantly lower academic performance than other students after two years (Woods and Wolke, 2004). A large study of middle and high school students in an ethnically and socioeconomically diverse city in the Midwest found that peer harassment was negatively related to both enjoying school and academic performance (Eisenberg et al., 2003).

Again, it is not only the victims of bullying that suffer negative consequences from bullying. Most studies distinguish between bullies, victims, and bully-victims (those who bully but are also victimized). For most of the outcomes studied, bully-victims are at least as likely to suffer negative consequences as pure victims, and are often worse off, as Olweus found in his pioneering work (Olweus, 1978; Olweus, 1993a). The aforementioned cross-national study of friendlessness conducted by Elsea et al. (2002) found that bully-victims had roughly the same levels of isolation and friendlessness as pure victims. Another cross-national study, including data from 25 countries, found that bully-victims were significantly worse off than victims with respect to alcohol use (23 countries), school adjustment (16 countries), and health problems (10 countries) (Nansel et al., 2004). A study conducted in a low socioeconomic status urban community found that bully-victims were the most troubled

70

group, with high levels of school misconduct, academic problems, and trouble relating positively to peers (Juvonen et al., 2003).

Finally, there is evidence, albeit mixed, that bullies themselves experience maladjustment as a result of their own aggressive behavior. The large, 25-country cross-national study mentioned above found that bullies were worse off than uninvolved students with respect to health problems (25 countries), school adjustment (24 countries), emotional problems (21 countries), and relationships with classmates (15 countries) (Nansel et al., 2004). A study of Italian adolescents found that indirect (or relational) bullying was significantly related to higher levels of stress and depression (Baldry, 2004). These findings are echoed by other studies of American, Australian, and European adolescents, which concluded that bullies are significantly more likely to experience symptoms of clinical depression (Saluja et al., 2004; Austin and Joseph, 1996; Slee, 1995; Swearer et al. 2001). Like their victims, bullies are significantly more likely to perform poorly in school (Nansel et al., 2001).

However, bullying others may not be entirely without benefit for the bully. Some studies have found that bullying enhances self-esteem (e.g., Trautwein et al., 2004). Others find that bullies enjoy high degrees of popularity (e.g., Espelage and Holt, 2001; Pelligrini et al., 1999), or at the very least, are active members of peer groups consisting of like-minded adolescents (e.g., Bagwell et al., 2000; Xie et al, 1999).

Ultimately, however, bullies are significantly more likely than others to have difficulty maintaining positive relations with others as adults (Rigby, 2001). They also face increased risk of engaging in more serious criminal activity later in young adulthood (Olweus, 1978, 1999). In the teen years, this predisposition is perhaps reflected in higher levels of disruptive behavior disorders, such as Oppositional Defiant Disorder and Conduct Disorder (Kokkinos and Panayiotou, 2003).

III. Race and Bullying

The evidence regarding race and bullying is decidedly mixed. Of the studies that consider race or ethnicity, several find no significant racial differences in the prevalence of bullying (e.g., Junger-Tas, 1999; Boulton, 1995; Losel and Bliesener, 1999). These results, however, like much of the work conducted on school bullying, come from the European context, where race relations likely differ from those in the United States. In the US, the few studies that consider race and ethnicity find mixed and sometimes contradictory results, but the majority find that minority students are more likely to be involved in bullying than whites, though it is not completely clear as to which role they tend towards (see Nansel et al., 2001; Graham and Juvonen, 2002; Hanish and Guerra, 2000).

Even less clear than the relationship between race and bullying is the extent to which the consequences of bullying differ according to race. Here we can only speculate, as to the author's knowledge there are no studies on this topic. However, there is reason to think that the consequences may vary, both according to the individual race of the participant, and by the overall racial context. While it did not measure other outcomes, a study of White and

72

Asian children found that, although there were no significant differences in the frequency of being bullied, half of the bullied Asian children were called racist names because of their skin color (Moran et al., 1993). It seems plausible, to say the least, that the consequences of such bullying may be different than the consequences of other forms of teasing.

While to the author's knowledge, no study of bullying considers racial diversity independent of individual race, there is some implication that bullying differs based on the larger racial and ethnic context as well. Most studies that have found that African-Americans are more likely to bully others have also been conducted in contexts that are predominantly Black (e.g., Juvonen et al. 2003, set in a predominantly minority area of Los Angeles). While the overall prevalence of bullying was similar to national estimates, in contrast to other research, this analysis found that bullies experienced significantly less depression, social anxiety, and loneliness than not just their victims, but uninvolved students as well (Juvonen et al., 2002). The study also found that bullies had significantly higher social status than both victims and uninvolved students, whereas other research consistently shows that bullies tend to be better off than victims, but significantly worse off than bystanders.

This finding is not limited to an urban setting: research in exclusively African-American schools in a rural Southern state found a large group of aggressive youths who were also highly popular (Farmer et al., 2003). Similarly, a study in seven predominantly African-American schools in Mississippi estimated that African-American students had higher rates of bullying, and that bullies had slightly higher levels of self-esteem than even the uninvolved students. However, neither difference quite reached statistically significance

because of the very small sample size (Seals and Young, 2003). Based on these studies, and the conceptual arguments presented above, we might expect to find racial differences in the consequences of bullying, and that these differences may themselves vary according to the racial diversity of the school.

However, Rowe et al. (1994) provide a compelling argument for racial similarity in many important developmental processes. They made comparisons, by race, of correlation matrices of a number of important psychological, academic, and environmental variables drawn from seven different data sources, and found no statistically significant differences in the correlations. In fact, they found that different racial groups were no more different than random halves of the same racial group. As such, they make a strong case that while group *averages* of these variables are known to differ widely, the underlying processes that lead to the outcomes are the same for all racial groups.

However, this does not imply that all outcomes are the same by race, as their study did not include outcomes where discrimination is known to have a direct effect. Had they included the likelihood of getting a loan or returning an appliance, they may have found racial differences. This raises the question of whether involvement in bullying is more like academic achievement, where the underlying causes of success appear to be the same for everyone, or like trying to catch a cab late at night.

However, even in outcomes where explicit racial discrimination is known to be common, it remains possible that the only true difference is not in the race of the individual,

but in the racial context. For example, if racist teasing causes greater harm than other forms, we might expect to find racial differences in the relationship between teasing and, say, depression. However, if racist teasing is not based on the race of the individual *per se*, but rather, on their status as a racial minority in that context (a black in a predominantly white school, or a white in a predominantly black school), then the underlying relationship between teasing and depression would be the same for both groups. The real question then becomes whether racist teasing is actually just about being different from the majority.

IV. Hypotheses

This analysis considers five outcomes which other research has linked to bullying, even if the direction or causal relationship is unclear: popularity, depression, anxiety, school attachment, and suicide attempts. The specific research questions are: 1) does the relationship between bullying and these outcomes vary according to the race or ethnicity of the student? 2) does the racial diversity of the school further modify the relationship between race, bullying, and the outcomes considered?

The five outcomes can be unambiguously placed in a better off/worse off spectrum, with "worse off" meaning lower popularity, lower school attachment, higher depression, higher anxiety, and a greater likelihood of suicide attempts. This is the case regardless of whether we consider the perspective of the adolescent or of concerned adults.[21] So for the sake of brevity, "worse off" here refers to lower popularity and school attachment, and higher anxiety, depression, and suicidality. Given that research has tended to find that bullies tend

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[21] Although adolescents and adults may disagree on the relative importance of, say, popularity versus school attachment, most teens would agree that, ceterus paribus, it is nicer to be in a school that feels like a family, and most parents would agree that, ceterus paribus, it is better for their child to be popular versus unpopular.

to be worse off than bystanders, and that virtually all studies have found that victims are significantly worse off than bystanders on every conceivable outcome, I first hypothesize that:

1. *Those who bully others will be worse off than those who do not.*

2. *Those who are bullied will be worse off than those who are not.*

3. *Those who both bully others and who are picked on themselves will be even worse off than those who are only bullies or only victims.*

Because they are substantially more likely to face racist bullying, which may have more severe consequences than other forms, I expect that

4. *Minority victims of bullying will be worse off than white victims of bullying.*

However, because studies finding that bullies are better off than bystanders tend have larger numbers of minorities, and because minority bullies, due to oppression and discrimination in the broader American context, may also take greater enjoyment in the exercise of power entailed in bullying, I hypothesize that:

5. *Minority bullies will be better off than white bullies.*

There are several reasons to believe that the racial differences hypothesized above may be negated by the racial context of the school. First, predominantly minority schools may provide a buffer of social support and probably make overtly racist bullying less likely, which then eliminates the hypothesized difference between minority and White victims of bullying. Second, the additional benefits that minority bullies may experience, such as the

psychological rewards of domination in a predominantly white school, may also be negated in predominantly minority schools. Finally, the strength of Rowe et al.'s (2004) analysis makes for compelling reasons to expect fundamental similarities between races. Accordingly, I hypothesize the following:

6. *the additional negative consequences of being a minority victim of bullying will be mitigated in predominantly minority schools.*

7. *the added benefit minority bullies enjoy will be negated in predominantly minority schools.*

V. Data and Methods

The Contexts of Adolescent Substance Use

The *Context of Adolescent Substance Use* study (hereafter, *Context*) is a longitudinal survey of all middle and high school students in three counties in North Carolina. The focus of *Context* is on alcohol, tobacco, and drug use, but it collects information on a wide range of other topics as well. The three counties were selected based on willingness to participate and proximity to Chapel Hill, North Carolina, where data collection and management occur. Unlike the Chapel Hill area, however, the participating counties are predominantly rural, with higher proportions of blacks and lower median incomes than national averages. The biannual in-school survey began in the spring of 2001 with wave 1; wave 5 data was collected in the spring of 2004. After wave 5, *Context* continued with two additional annual surveys, which means that the oldest cohort has been followed through high school.[22]

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[22] Wave 6 was administered in the fall of 2004, wave 7 was administered in the fall of 2005.

At wave 1, all public school students in grades 6, 7, and 8 for each county were asked to participate, resulting in over 5,000 participants divided among 29 networks. By wave 4 and 5, these 29 networks had been condensed into 19 school networks, as the students moved out of elementary and middle schools, and into high schools. The response rate has been maintained at or above 80% for the first five waves of data, and above 75% for the final waves.

In addition to questions concerning substance use, aggressive behaviors, academic performance, depression, dating violence, school attachment, suicide attempts, physical development, family life, and neighborhood characteristics, the survey asks students to nominate up to five of their best friends. Beginning in waves 4 and 5, the survey adds questions asking students to nominate up to five students whom they "are mean to or pick on" and up to five students who are mean to or pick on the respondent. The survey also asks questions regarding the manner of bullying and the frequency with which it occurs. Accordingly, all analyses in this dissertation use data from waves 4 and 5.[23]

Dependent Variables.

Popularity. Popularity is measured by first calculating normed betweenness centrality in the friendship network, using UCINET (Borgatti et al., 2002). A geodesic is the shortest possible path between any given pair of actors, and normed betweenness centrality is the proportion of all geodesics in the network that include ego. So, a betweenness centrality of .02 means that ego lies on 2 percent of all possible geodesics. However, because the survey

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[23] Later waves are not used because data were not cleaned at the time of writing, and the largest county dropped out of the study after wave 5.

limits the number of friendship nominations to five, mean betweenness centrality declines as the size of the network increases. It is easier to have normed betweenness of .20 in a network of 10 than in one of 100, particularly when the larger network is more sparse due to the limit on nominations. To address this issue, I create a popularity percentile measure, whereby each students betweenness is divided by the highest betweenness in their network, resulting in a measure that is comparable across networks.

Depression. Depression is measured using the scale developed by Angold et al. (1995) as part of the Short Mood and Feelings Questionnaire, and includes of the following three four-point agree/disagree items, covering the past three months and ranging from "strongly agree" to "strongly disagree": "I hated myself," "I was a bad person," and "I did everything wrong." To address the possibility of measurement error, a latent variable measurement model was estimated in MPLUS. Model fit for both waves was excellent (wave 4: RMSEA=0.008; CFI=0.999; TLI=0.999; SRMR=0.020; wave 5: RMSEA=0.00; CFI=1.00; TLI=1.00; SRMR=0.007) and factor scores were output for use as the dependent variable here.

Anxiety. The measure of anxiety is based on the subscale developed by Reynolds and Richmond (1979) and includes the following three agree/disagree items, covering the past three months: "I worried about what was going to happen," "I worried when I went to bed at night," and "I often worried about bad things happening to me." The response scale for all 3 items included: 0 = "strongly agree", 1 = "agree somewhat", 2 = "neither", 3 = "disagree somewhat", and 4 = "strongly disagree." Again, a latent measurement model was estimated

in MPLUS (Wave 4: RMSEA=0.00; CFI=1.00; TLI=1.00; SRMR=1.00; wave 5:
RMSEA=0.014; CFI=0.998; TLI=0.997; SRMR=0.016). Factor scores were output and used
here.

School attachment. School attachment is based on a scale developed by Roberts et al.
(1995) and is measured by following three agree/disagree items: "students in this school
treat each other with respect," students at this school are willing to go out of their way to help
someone," and "my school is like a family." The response scale for all three items included:
0 = "strongly agree", 1 = "agree somewhat", 2 = "neither", 3 = "disagree somewhat", and 4 =
"strongly disagree." A latent variable measurement model was estimated in MPLUS (wave
4: RMSEA=0.018; CFI=0.989; TLI=0.975; SRMR=0.013; wave 5: RMSEA=0.00;
CFI=1.00; TLI=1.00; SRMR=0.00) and factor scores included in this analysis.

Suicide Attempts. Beginning in wave 4, students were asked if they had ever "talked
with a doctor, nurse, teacher, priest, minister, counselor, therapist, or parent because you had
attempted to commit suicide." For ethical reasons, we were unable to ask students about
current suicidal thoughts or all past suicide attempts. For ease of interpretation, rather than
include wave 4 suicide attempts as an independent variable in the model of subsequent
suicide attempts (and therefore model change in suicide attempts), I drop the 143 cases where
the student had already attempted suicide by wave 4, and only include those who had never
reported attempting suicide.[24] Because of the scarcity of suicide attempts, I included data

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[24] However, a model including all respondents and controlling for wave 4 suicide attempts is substantively no
different.

from waves 5 through 7 in the binary outcome. Thus, respondents received a 1 if they ever

reported attempting suicide between wave 5 and wave 7 and a 0 otherwise.

Independent Variables

Race. Contexts asks students to report their race as one of the following categories:

White, Black or African-American, Hispanic or Latino, American Indian or Native

American, Asian or Pacific Islander, Multiracial, or Other. Because of low frequencies,

however, we use White, African-American, Latino, and Other, with White as the reference

category. At the school level, I measure race as percent minority.

Bullying. Involvement in bullying is measured using the set of questions asking

students to name (up to five other students) who they pick on or are mean to, and those who

are mean to or pick on them. These nominations are used to generate a network of bullying,

which has the advantage of relying on both self- and peer-reports. To mitigate

underreporting of bullying behavior, I consider A to bully B if either A nominates B as a

victim, or B nominates A as a bully. Based on this network, I measure bullying with bullying

outdegree, or simply the number of students the respondent picks on. Correspondingly, I

measure victimization using bullying indegree, or the number of students who pick on ego.

Finally, I measure bully-victim status using an interaction of bullying indegree and

outdegree.

Control variables. I include the following as control variables: gender (male is the reference), age,[25] academic performance (an average of grades in each of the following subjects: English, mathematics, history, and science), family composition (an indicator variable for whether the adolescent lives with both parents), parental educational attainment (the highest degree attained, separate for both parents, where 0=less than high school and 5=graduate school), and extracurricular activities (a series of indicators for sports teams, service clubs, performing arts, school newspaper or yearbook, and honor societies).

Methods. Because students are nested within both schools and neighborhoods, I estimated cross-classified hierarchical linear models for all four continuous outcomes. I include only random intercepts at the neighborhood and school levels, as while the overall level of any given outcome may vary across neighborhoods or schools, I do not anticipate that the fundamental processes involved will differ in ways not already included in the model, particularly given the relative homogeneity of the sample, which is drawn from rural North Carolina. I use multiple imputation to address missing data, generating five imputed datasets. The equations for the four linear outcomes are:

Level 1:

$$Y_{ij} = \beta_{0j} + \beta_{0k} + \beta_1 (\text{Outcome at wave 4})_{ij} + \beta_2 (\text{Network Size})_{ij} + \beta_3 (\text{Male})_{ij} + \beta_4 (\text{Black})_{ij} + \beta_5 (\text{Latino})_{ij}$$
$$+ \beta_6 (\text{Other Minority})_{ij} + \beta_7 (\text{One parent home})_{ij} + \beta_8 (\text{Age})_{ij} + \beta_{9-15} (\text{Activities})_{ij} + \beta_{16} (\text{Mother's Education})_{ij} +$$
$$\beta_{17} (\text{Father's Education})_{ij} + \beta_{18} (\text{Bullying outdegree})_{ij} + \beta_{19} (\text{Bullying indegree})_{ij} + \beta_{20-32} (\text{Interactions})_{ij} + r_{ij}$$

Level 2 Intercepts:

$$\beta_{0j} = \gamma_{00} + u_{0j}$$

$$\beta_{0k} = \gamma_{01} + u_{0k}$$

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[25] I also tried models with grade in school instead of age, with no substantive differences.

Combined Model:

$$Y_{ij} = \gamma_{00} + \gamma_{01} + \beta_1 (\text{Outcome at wave 4})_{ij} + \beta_2 (\text{Network Size})_{ij} + \beta_3 (\text{Male})_{ij} + \beta_4 (\text{Black})_{ij} + \beta_5 (\text{Latino})_{ij}$$
$$+ \beta_6 (\text{Other Minority})_{ij} + \beta_7 (\text{One parent home})_{ij} + \beta_8 (\text{Age})_{ij} + \beta_{9-15} (\text{Activities})_{ij} + \beta_{16} (\text{Mother's Education})_{ij} +$$
$$\beta_{17} (\text{Father's Education})_{ij} + \beta_{18} (\text{Bullying outdegree})_{ij} + \beta_{19} (\text{Bullying indegree})_{ij} + \beta_{20-32} (\text{Interactions})_{ij} + r_{ij} + r_{ij}$$

where Y_{ij} is the dependent variable at wave 5, γ_{00} and γ_{01} are random intercepts at

the school and neighborhood levels, respectively, β_{0j} is an individual intercept, β_1 - β_{32} are

coefficients for independent variables at the individual level, u_{0j} and u_{0k} are randomly

distributed error terms at the school and neighborhood levels, and r_{ij} is a random individual

error term. The equation for the model of suicide is substantively identical, with the

exception that it drops the few cases that had already attempted suicide by wave 4 rather than

include wave 4 suicide in the model. It is estimated using the proc glimmix option in SAS 9.

Results

Table 3.1 displays the summary statistics for the variables used in the models. The

figures are largely self-explanatory, but a few items are worth noting. First, while depression

and anxiety are relatively constant between waves 4 and 5, school attachment increases

dramatically and popularity becomes less skewed. Six percent of the sample had attempted

suicide prior to wave 4, and an additional 4 percent attempted suicide afterwards. Students

are active in extra-curricular activities: over half participated in sports, one-third in service

clubs, and one-quarter in honors societies.

Table 3.1: Descriptive Statistics

	Mean	S. E	Min	Max
Wave 4 betweeness centrality (percentile)	12.70	16.75	0.00	100.00
Wave 5 betweeness centrality (percentile)	11.06	16.64	0.00	100.00
Wave 4 depression	0.02	1.17	-4.32	4.73
Wave 5 depression	0.03	1.24	-4.36	4.60
Wave 4 anxiety	0.01	1.20	-4.47	4.60
Wave 5 anxiety	0.01	1.26	-4.42	4.65
Wave 4 school attachment	-1.29	1.23	-5.28	3.08
Wave 5 school attachment	-0.01	1.02	-3.62	3.47
Male	0.49	0.50	0.00	1.00
Black	0.35	0.48	0.00	1.00
Latino	0.04	0.19	0.00	1.00
Other minority	0.07	0.24	0.00	1.00
One parent household	0.13	0.30	0.00	1.00
Age	14.60	1.04	12.00	18.00
Mother's education	2.22	1.49	0.00	5.00
Father's education	2.00	1.55	0.00	5.00
GPA	1.80	0.87	0.00	4.00
Participates in sports	0.54	0.48	0.00	1.00
Participates in service clubs	0.32	0.44	0.00	1.00
Participates in arts	0.26	0.41	0.00	1.00
Participates in yearbook/newspaper	0.14	0.31	0.00	1.00
Participates in honors societies	0.25	0.41	0.00	1.00
Participates in DARE	0.09	0.25	0.00	1.00
School size	571.37	304.69	21.00	1564.00
Percent minority in school	0.48	0.18	0.11	0.93
Bullying outdegree	0.77	1.30	0.00	9.00
Bullying indegree	0.79	1.49	0.00	17.00

N=5,010

Table 3.2 presents the results for popularity. Although I included both random
intercepts, the model found no variation in popularity occurring at the neighborhood level.
The random intercept at the school level, however, was significant. Model A shows that
school size has a negative effect on popularity, despite the fact that popularity is normalized
to a percentile scale. It is more difficult to be a big fish in a big pond.

Table 3.2: Cross-Classified HLM of Popularity (Percentile)

	Model A		Model B		Model C	
	β	SE	β	SE	β	SE
Intercept	29.09 ***	4.88	29.31 ***	4.89	30.23 ***	4.87
Popularity at wave 4	0.25 ***	0.01	0.25 ***	0.01	0.25 ***	0.01
Network size	-0.01 **	0.00	-0.01 **	0.00	-0.01 **	0.00
Male	-1.89 ***	0.48	-1.89 ***	0.48	-1.89 ***	0.48
One parent	-2.03 *	0.79	-2.01 *	0.79	-2.05 **	0.78
Age	-1.02 **	0.32	-1.03 **	0.32	-1.06 ***	0.32
Participates in sports	1.72 **	0.53	1.72 ***	0.53	1.73 ***	0.53
Participates in service clubs	-0.11	0.60	-0.10	0.60	-0.09	0.60
Participates in arts	0.38	0.67	0.38	0.67	0.40	0.67
Participates in yearbook/newspaper	-2.14 **	0.81	-2.10 *	0.82	-2.10 *	0.82
Participates in honors societies	0.45	0.75	0.44	0.74	0.38	0.74
Participates in DARE	-0.46	1.05	-0.55	1.06	-0.53	1.06
Mother's education	0.13	0.19	0.12	0.19	0.12	0.19
Father's education	0.01	0.22	0.02	0.22	0.03	0.22
GPA	0.00	0.34	0.01	0.34	0.01	0.34
Percent minority	-3.56	3.76	-3.46	3.77	-4.71	3.75
Black	-0.04	0.56	-0.49	0.66	-0.28	0.66
Latino	0.64	1.24	1.34	1.48	1.59	1.48
Other minority	-1.46	1.00	-2.13 ^	1.20	-2.10 ^	1.20
Bullying outdegree	0.36 *	0.18	0.01	0.26	0.02	0.26
Bullying indegree	-0.30 ^	0.16	-0.17	0.22	-0.16	0.22
Bullying outdegree * Black			0.67 ^	0.40	0.03	0.97
Bullying indegree * Black			-0.09	0.35	-0.92	0.72
Bullying outdegree * Latino			0.13	0.97	2.81	2.74
Bullying indegree * Latino			-0.99	0.82	-2.69	2.36
Bullying outdegree * Other minority			1.23 ^	0.71	-5.44 **	1.89
Bullying indegree * Other minority			-0.43	0.61	0.07	2.21
Percent minority*Black*Bullying outdegree					1.19	1.57
Percent minority*Black*Bullying indegree					1.96	1.46
Percent minority*Latino*Bullying outdegree					-5.48	5.37
Percent minority*Latino*Bullying indegree					3.30	4.32
Percent minority*Other minority*Bullying outdegree					14.93 ***	3.86
Percent minority*Other minority*Bullying indegree					-1.49	4.03
School Random intercept	9.14 *	4.34	9.19 *	4.37	8.75 *	4.17
Neighborhood random intercept	—	—	—	—	—	—
N=5,010						

^.<.05, one-tail test; *p<.05; **p<.01; ***p<.001

Boys were less popularity than girls by an average of nearly two percentile points. Somewhat surprisingly, older students were also less popular. One possible interpretation of this finding is that older students are more likely to have failed grades and therefore have academic and social or emotional problems. As might be expected, athletes were more

popular, while those who participated in yearbook were less so. We find no significant differences for other extra-curricular activities, and parental education seems to have no effect either. Surprisingly, average grades has no effect on popularity in either direction. Race, either at the individual or the school level, also has no significant effect on popularity, which might be interpreted as a sign of social progress.

Finally, bullying other students *increases* one's popularity, contrary to hypothesis 1. For every three victims, a bully increased her popularity by one percentile point between waves 4 and 5. Conversely, victims lost popularity. On average, a victim with ten bullies would drop three percentile points, or nearly one-fifth of a standard deviation. I also tested models (not shown) with an added interaction between bullying indegree and bullying outdegree, but neither the interaction nor the main effects were significant, so the interaction is excluded from further models.

In model B, we find that African-American students and those of other (non-Latino) minority backgrounds enjoy a particular popularity boost when they bully others, supporting hypothesis 5. Figure 2 plots the interactions between race and bullying, showing that particular benefit enjoyed by African-Americans and other non-Latino minorities. In fact, the "other" minorities face a popularity deficit in comparison to whites, unless they engage in bullying behavior. In model C, which includes interactions with school diversity, we find that the interaction between black and bullying becomes insignificant. Other minorities maintain their popularity boost from bullying, but only in schools with high proportions of minority students, contrary to hypothesis 7.

Figure 2: Predicted Effect of Bullying Outdegree on Popularity, by Race
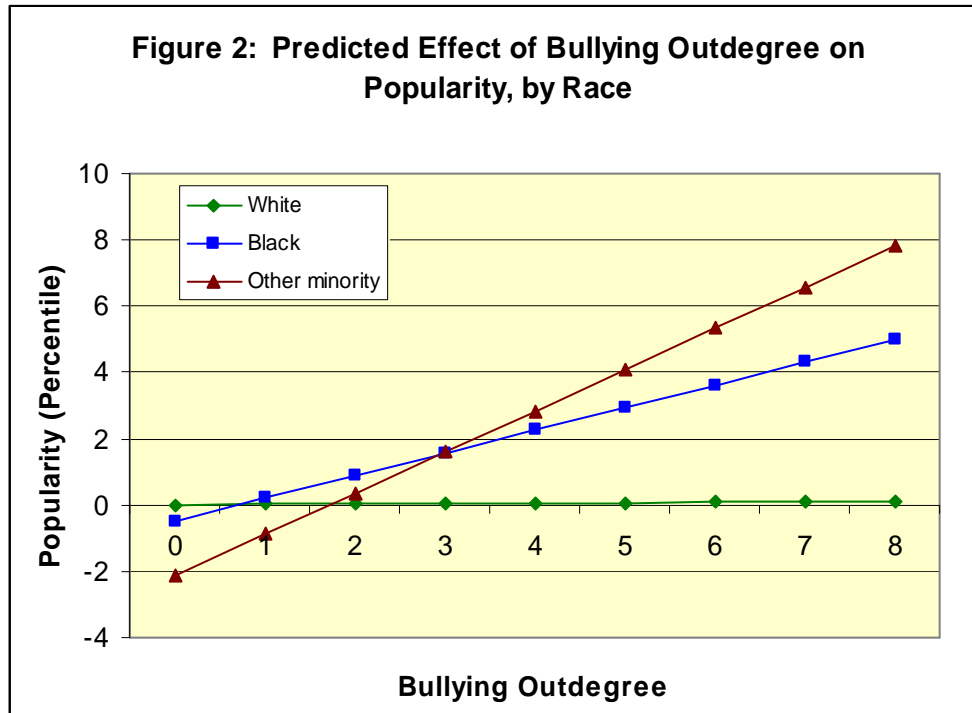

Table 3.3 presents results for depression. No variation in depression was found at the neighborhood level, and the random school intercept is also not statistically significant. Depression was higher for kids in large schools than for those in smaller schools. We find no significant gender, age, or family structure differences, and parent education is also once again insignificant.

Table 3.3: Cross-Classified HLM of Depression

	β	SE	β	SE	β	SE
Intercept	0.17	0.30	0.17	0.30	0.17	0.30
Depression at Wave 4	0.50 ***	0.02	0.50 ***	0.02	0.50 ***	0.02
Network size	0.00 ^	0.00	0.00 ^	0.00	0.00 ^	0.00
Male	-0.07 ^	0.04	-0.07 ^	0.04	-0.07 ^	0.04
One parent	-0.05	0.07	-0.05	0.07	-0.05	0.07
Age	0.00	0.02	0.00	0.02	0.00	0.02
Participates in sports	0.01	0.04	0.01	0.04	0.01	0.04
Participates in service clubs	-0.11 *	0.05	-0.11 *	0.05	-0.11 *	0.05
Participates in arts	0.00	0.04	0.00	0.04	0.00	0.04
Participates in yearbook/newspaper	0.06	0.07	0.06	0.07	0.06	0.07
Participates in honors societies	-0.06	0.06	-0.06	0.06	-0.06	0.05
Participates in DARE	-0.04	0.08	-0.04	0.08	-0.04	0.08
Mother's education	0.03	0.02	0.03	0.02	0.03	0.02
Father's education	-0.02	0.01	-0.02	0.01	-0.02	0.01
GPA	-0.10 ***	0.02	-0.10 ***	0.02	-0.10 ***	0.02
Percent minority	-0.15	0.13	-0.15	0.13	-0.15	0.13
Black	-0.09 *	0.04	-0.10 *	0.05	-0.10 *	0.05
Latino	0.10	0.09	0.11	0.11	0.11	0.11
Other minority	0.07	0.07	0.00	0.09	0.00	0.09
Bullying outdegree	0.02 ^	0.01	0.02	0.02	0.02	0.02
Bullying indegree	0.03 *	0.01	0.02	0.02	0.02	0.02
Bullying outdegree * Black			-0.01	0.03	-0.01	0.07
Bullying indegree * Black			0.02	0.03	0.01	0.05
Bullying outdegree * Latino			0.01	0.07	0.08	0.19
Bullying indegree * Latino			-0.02	0.07	-0.17	0.22
Bullying outdegree * Other minority			0.04	0.05	0.14	0.14
Bullying indegree * Other minority			0.04	0.05	0.05	0.16
Percent minority*Black*Bullying outdegree					0.01	0.11
Percent minority*Black*Bullying indegree					0.00	0.11
Percent minority*Latino*Bullying outdegree					-0.14	0.35
Percent minority*Latino*Bullying indegree					0.29	0.37
Percent minority*Other minority*Bullying outdegree					-0.22	0.27
Percent minority*Other minority*Bullying indegree					0.00	0.31
School Random intercept	0.001	0.002	0.001	####	0.001	0.002
Neighborhood random intercept	—	—	—	—	—	—
N=5,010						

^.<.05, one-tail test; *p<.05; **p<.01; ***p<.001

Most extra-curricular activities also have no significant effect on depression. The lone exception is participation in service clubs, which appears to decrease depression, as might be expected. Students with better grades also experienced significantly reduced depression between waves.

While school diversity is not related to depression, black students experienced significantly less depression than whites. Consistent with hypotheses 1 and 2, involvement in bullying significantly increased depression. I also tested the interaction of bullying outdegree and indegree (not shown), but again, neither the main effects nor the interaction were significant in any of the depression models, so the interaction was dropped. Model B includes interactions between bullying and race, but finds no evidence that the effects of bullying involvement on depression differ by race. Finally, model C adds interactions between race, bullying involvement, and school diversity, but none of the interactions have a significant effect. It would appear, then that involvement in bullying significantly increases depression uniformly across racial groups and school settings.

Table 3.4 presents results for anxiety. First, the model found no variation in anxiety at the school level, and the neighborhood level random intercept was insignificant. On average, boys were significantly less anxious than girls, and those with low grade point averages were significantly more anxious. African-American students were somewhat less anxious than whites, which is in keeping with other research suggesting lower levels of depression and anxiety. Finally, while being victimized is not significant, bullying others appears to increase anxiety, supporting hypothesis 1. Models B and C test interactions between race, bullying and diversity, but find no significant variation in the relationships.

Table 3.4: Cross-Classified HLM of Anxiety

	β	SE	β	SE	β	SE
Intercept	-0.16	0.31	-0.16	0.31	-0.17	0.306
Anxiety at wave 4	0.48 ***	0.02	0.48 ***	0.02	0.48 ***	0.019
Network size	0.00	0.00	0.00	0.00	0.00	0.000
Male	-0.21 ***	0.04	-0.21 ***	0.04	-0.21 ***	0.037
One parent	0.03	0.06	0.03	0.06	0.03	0.061
Age	0.02	0.02	0.02	0.02	0.02	0.021
Participates in sports	-0.04	0.04	-0.04	0.04	-0.04	0.042
Participates in service clubs	-0.04	0.05	-0.04	0.05	-0.04	0.050
Participates in arts	0.06	0.05	0.06	0.05	0.06	0.047
Participates in yearbook/newspaper	-0.06	0.06	-0.06	0.06	-0.06	0.059
Participates in honors societies	-0.02	0.05	-0.02	0.05	-0.02	0.054
Participates in DARE	0.00	0.08	0.00	0.07	0.00	0.075
Mother's education	0.01	0.02	0.01	0.02	0.01	0.018
Father's education	0.00	0.01	0.00	0.01	0.00	0.014
GPA	-0.08 **	0.02	-0.08 **	0.02	-0.08 **	0.024
Percent minority	0.04	0.12	0.03	0.12	0.03	0.133
Black	-0.08 ^	0.04	-0.07	0.05	-0.07	0.051
Latino	0.07	0.09	0.09	0.12	0.08	0.115
Other minority	0.03	0.09	0.06	0.10	0.06	0.097
Bullying outdegree	0.02 ^	0.01	0.03	0.02	0.03	0.019
Bullying indegree	0.02	0.01	0.02	0.02	0.02	0.016
Bullying outdegree * Black			-0.02	0.03	-0.05	0.078
Bullying indegree * Black			0.01	0.03	0.04	0.056
Bullying outdegree * Latino			0.04	0.08	-0.01	0.213
Bullying indegree * Latino			-0.06	0.06	-0.21	0.188
Bullying outdegree * Other minority			-0.03	0.06	0.14	0.158
Bullying indegree * Other minority			-0.01	0.04	-0.07	0.170
Percent minority*Black*Bullying outdegree					0.06	0.123
Percent minority*Black*Bullying indegree					-0.07	0.126
Percent minority*Latino*Bullying outdegree					0.11	0.390
Percent minority*Latino*Bullying indegree					0.31	0.340
Percent minority*Other minority*Bullying outdegree					-0.36	0.344
Percent minority*Other minority*Bullying indegree					0.12	0.311
School Random intercept	—	—	—	—	—	—
Neighborhood random intercept	0.001	0.004	0.001	0.004	0.001	0.004
N=5,010						

^.<.05, one-tail test; *p<.05; **p<.01; ***p<.001

Table 3.5 presents the results for school attachment, and shows no significant variation

for either the random school or random neighborhood intercepts. The size of the school,

however, is negatively related to school attachment, even after controlling for age, which is

positively related to attachment. Surprisingly, considering their superior academic

achievement, girls are significantly less attached to school than boys. Those who participate

in sports are more attached to school, while those who are involved in the arts are less so.

Finally, the racial diversity of the school is negatively related to school attachment,

regardless of individual race, which is not related to school attachment.

Table 3.5: Cross-Classified HLM of School Attachment

	β	SE	β	SE	β	SE
Intercept	0.33	0.27	0.32	0.27	0.33	0.271
School attachment at wave 4	0.38 ***	0.01	0.38 ***	0.01	0.38 ***	0.013
Network size	0.00 ***	0.00	0.00 ***	0.00	0.00 ***	0.000
Male	0.11 **	0.03	0.11 **	0.03	0.11 **	0.034
One parent	-0.01	0.05	-0.01	0.05	-0.01	0.051
Age	0.03 ^	0.02	0.03 ^	0.02	0.04 ^	0.020
Participates in sports	0.06 ^	0.04	0.06 ^	0.04	0.06 ^	0.036
Participates in service clubs	0.05	0.04	0.05	0.04	0.05	0.040
Participates in arts	-0.07 ^	0.03	-0.07 ^	0.04	-0.07 ^	0.035
Participates in yearbook/newspaper	0.05	0.05	0.05	0.05	0.05	0.046
Participates in honors societies	-0.02	0.04	-0.02	0.04	-0.02	0.041
Participates in DARE	0.03	0.07	0.03	0.07	0.03	0.066
Mother's education	-0.01	0.01	-0.01	0.01	-0.01	0.014
Father's education	0.00	0.01	0.00	0.01	0.00	0.014
GPA	0.02	0.02	0.02	0.02	0.02	0.020
Percent minority	-0.47 ***	0.13	-0.47 ***	0.13	-0.51 ***	0.142
Black	-0.07 ^	0.04	-0.07	0.05	-0.06	0.047
Latino	0.11	0.08	0.09	0.10	0.08	0.095
Other minority	-0.11	0.08	-0.19 *	0.08	-0.18 *	0.075
Bullying outdegree	-0.02	0.02	0.00	0.02	0.00	0.017
Bullying indegree	0.00	0.01	-0.02 ^	0.01	-0.02	0.013
Bullying outdegree * Black			-0.04 ^	0.03	-0.07	0.058
Bullying indegree * Black			0.03 ^	0.02	0.05	0.041
Bullying outdegree * Latino			-0.05	0.06	-0.28 ^	0.165
Bullying indegree * Latino			0.07	0.05	0.12	0.147
Bullying outdegree * Other minority			0.06	0.05	0.04	0.110
Bullying indegree * Other minority			0.03	0.06	-0.04	0.138
Percent minority*Black*Bullying outdegree					0.05	0.090
Percent minority*Black*Bullying indegree					-0.03	0.082
Percent minority*Latino*Bullying outdegree					0.49	0.316
Percent minority*Latino*Bullying indegree					-0.10	0.274
Percent minority*Other minority*Bullying outdegree					0.04	0.229
Percent minority*Other minority*Bullying indegree					0.14	0.277
School Random intercept	0.005	0.003	0.005	0.003	0.005	0.003
Neighborhood random intercept	0.000	0.002	0.001	0.002	0.001	0.002
N=5,010						

^.<.05, one-tail test; *p<.05; **p<.01; ***p<.001

Oddly, grades are unrelated to school attachment, and there appears to be no significant relationship between bullying involvement and school attachment. However, once interactions between race and bullying are introduced (model B), we find that the main effect of bullying indegree becomes significant and negative. The interactions between race and bullying are significant only at the .10 level, and in the opposite direction of what I hypothesized, but are worth considering nonetheless. We find that the positive interaction between bullying indegree and Black essentially cancels out the negative main effect of being picked on (Figure 3). So, it appears that Whites become more detached from school when they are picked on, while Blacks become more detached when they pick on others.

Figure 3: Effects of Bullying Outdegree and Indegree on School Attachment, by Race
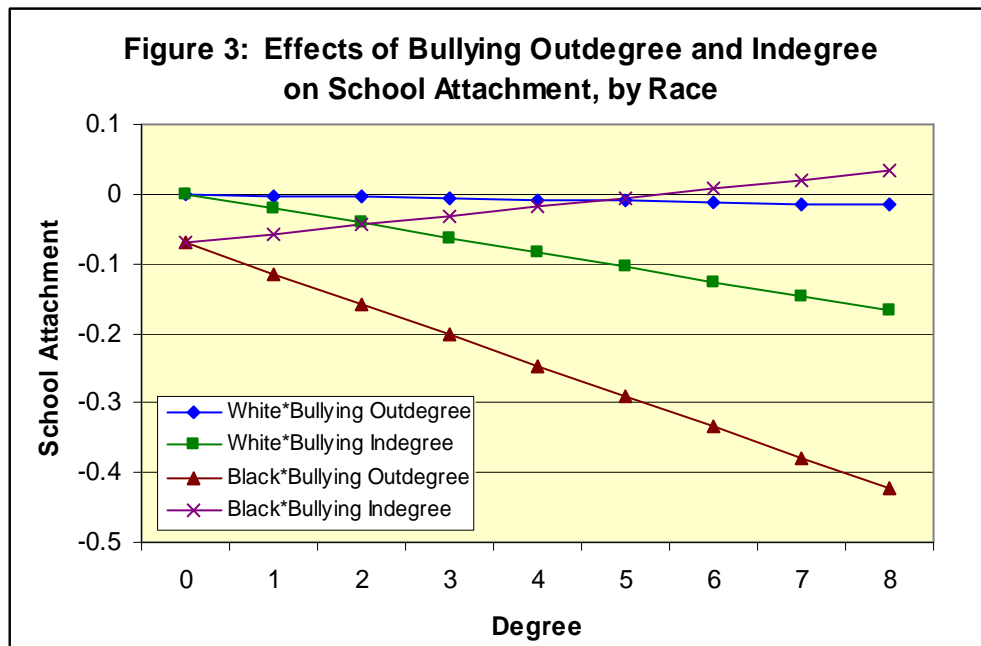
Finally, table 3.6 displays the results of suicide attempts.[26] Initially, a cross-classified model was estimated (again with random intercepts at both the neighborhood and school levels) using proc glimmix in SAS 9, but the model would not converge. I was able to estimate the two random effects in separate models, but neither were significant and so I present an ordinary logistic regression model.[27]

We find that school size is positively related to suicide attempts: for every additional 100 students, the likelihood of suicide increases by 10 percent. Girls and those who live in one parent homes are 1.8 and 1.5 times as likely, respectively, to attempt suicide (compared to boys and those in two-parent homes). Kids who participate in service clubs are less likely to attempt suicide, while those who serve on the yearbook or student paper are more likely than others to do so.

With respect to race, blacks are just 40 percent as likely as whites to attempt suicide, and are also significantly less likely than all other racial groups. Regardless of race, attending a high-minority school increases risk of suicide significantly: for every one percentage point increase in the percent minority in the school, the likelihood of suicide increases by one percent. Bullying others is not related to suicide attempts, but being victimized increases the likelihood of attempting suicide: for every additional person who

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[26] Again, for ethical reasons, the measure only counts suicide attempts that were reported to a responsible adult, and thus, may not reflect all suicide attempts. It is only for the sake of brevity that I refer to the measure simply as suicide attempts. For ease of interpretation, rather than include an indicator for whether the respondent had ever attempted suicide by wave 4, and then model *change* in suicide attempts, I exclude the 143 respondents who had reported suicide attempts prior to wave 4. I therefore use wave 4 indicators to model the likelihood of a suicide attempt between waves 5 and 7.

[27] There were no substantive differences between models that included random intercepts (at either the school or neighborhood level) and models with no random intercepts.

bullies her, a victim's likelihood of suicide increases by 13 percent. Despite the strong effects of race, diversity, and bullying, we find no significant interactions between any of these factors.

Table 3.6: Cross-Classified Hierarchical Mixed Model of Suicide Attempts

	β	SE	β	SE	β	SE
Intercept	0.07	0.20	0.08	0.20	0.04	0.20
Network size	0.00	0.00	0.00	0.00	0.00	0.00
Male	0.09 ***	0.02	0.09 ***	0.02	0.09 ***	0.02
One parent	0.06	0.04	0.06	0.04	0.06	0.04
Age	0.00	0.01	0.00	0.01	0.00	0.01
Participates in sports	-0.01	0.03	-0.01	0.03	-0.01	0.03
Participates in service clubs	-0.06 ^	0.03	-0.05 ^	0.03	-0.05 ^	0.03
Participates in arts	-0.02	0.04	-0.02	0.04	-0.02	0.04
Participates in yearbook/newspaper	0.09 ^	0.05	0.09 ^	0.05	0.09 ^	0.05
Participates in honors societies	-0.04	0.04	-0.04	0.04	-0.04	0.04
Participates in DARE	0.10	0.06	0.09	0.06	0.09	0.06
Mother's education	-0.01	0.02	-0.01	0.02	-0.01	0.02
Father's education	0.02	0.01	0.02	0.01	0.02	0.01
GPA	-0.01	0.02	-0.01	0.02	-0.01	0.02
Percent minority	0.06	0.08	0.07	0.08	0.14 ^	0.08
Black	0.00	0.03	-0.02	0.03	-0.03	0.03
Latino	-0.02	0.07	-0.01	0.07	-0.01	0.07
Other minority	0.07	0.05	0.08	0.06	0.07	0.06
Bullying outdegree	0.02 ^	0.01	0.01	0.01	0.01	0.01
Bullying indegree	-0.01	0.01	-0.01	0.01	-0.01	0.01
Bullying outdegree * Black			0.02	0.02	0.09 *	0.04
Bullying indegree * Black			-0.01	0.02	0.01	0.04
Bullying outdegree * Latino			-0.06	0.05	-0.06	0.13
Bullying indegree * Latino			0.04	0.04	0.15	0.11
Bullying outdegree * Other minority			0.01	0.03	-0.04	0.09
Bullying indegree * Other minority			-0.02	0.03	0.18 ^	0.10
Percent minority*Black*Bullying outdegree					-0.12 ^	0.07
Percent minority*Black*Bullying indegree					-0.03	0.07
Percent minority*Latino*Bullying outdegree					-0.01	0.26
Percent minority*Latino*Bullying indegree					-0.21	0.20
Percent minority*Other minority*Bullying outdegree					0.10	0.19
Percent minority*Other minority*Bullying indegree					-0.39 *	0.18
School Random intercept	0.0010	0.0013	0.0010	0.0013	0.0013	0.0014
Neighborhood random intercept	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003
N=3,077						

^.<.05, one-tail test; *p<.05; **p<.01; ***p<.001

Conclusions

This analysis has considered a number of different outcomes, with mixed results. Before drawing general conclusions, however, it is worth considering some of the findings that were not part of my hypotheses. First, school size, when it is significant, is related to negative outcomes: more depression, more suicide attempts, and lower school attachment. Boys are less popular than girls, on average, but they appear to be happier: they have lower levels of depression and anxiety, are less likely to attempt suicide, and are more attached to school.

High school stereotypes are reinforced in this analysis. First, we find beneficial effects of volunteering: those who participate in service clubs are less depressed and less likely to attempt suicide. Those who are involved in yearbook or the school paper, on the other hand, are less popular and more likely to attempt suicide. Athletes are, not surprisingly, more popular and more attached to school. Earning good grades reduces depression and anxiety, on average.

Turning to the core findings, we find that *involvement in bullying is a significant factor in all of the outcomes considered*. Victims of bullying become less popular, more depressed, less attached to school (with racial variation), and more likely to attempt suicide. However, bullying others leads to *increased* popularity, though at the cost of greater anxiety and depression. Others have found that bullies are often popular(e.g., Olweus, 1993; Pelligrini et al., 1999), though to the author's knowledge this is the first analysis that has used longitudinal data to show that bullying actually increases social status. This analysis

suggests that what may appear to be senseless cruelty may actually be instrumental behavior, with lasting rewards beyond the fleeting entertainment value of bullying.

In general, we find that African-American students are psychologically somewhat better off than Whites, as they are significantly less depressed, less anxious and less likely to attempt suicide. This finding is consistent with much other research (e.g., Riolo et al., 2005). Racially diverse schools, however, tend to have students who are less attached to school, and also to have more frequent suicide attempts. This is somewhat paradoxical because in this setting, more diverse schools have more African-American students—who have lower rates of suicide attempts than Whites. It is possible (though not certain) that the deleterious effects of diversity are on Whites.

While we find effects of bullying, race, and diversity on several of the outcomes, only rarely is there any evidence that the consequences of bullying involvement vary by race. Specifically, we find no racial differences in any of the mental health outcomes. This is consistent with research by Rowe et al. (1994) that finds no racial variation in the correlations between a wide range of social and psychological variables.

However, we do find racial variation in the consequences of bullying for the two outcomes that are, perhaps, more contingent on local processes as opposed to the more fundamental and universal factors involved in psychological pathology. For African-Americans and other non-Latino minorities, bullying others increases popularity more than it does for whites, and for African-Americans, bullying others also decreases school

attachment. We also find that, after being bullied, Whites, Latinos, and other minorities become less attached to school, while being picked on appears to have a negligible effect on African-Americans' school attachment. Interestingly, we find that while school diversity itself has consequences, it has no moderating effect on race-bullying interactions (with one exception).

This study has provided support for the idea that psychological processes are no different for adolescents of different races. Involvement in bullying diminishes mental health, regardless of race. We cannot conclude from this analysis, however, that all the consequences of bullying are invariant by race. In particular, future research should attempt to learn more about why African-Americans and non-Latino minorities appear to enjoy particular status benefits from bullying others.

Finally, I would like to consider the implications of this analysis for prevention. First, this analysis joins the chorus of research showing how important it is to prevent bullying. The physical and mental health of children and adolescents are severely diminished when they become involved in bullying, either as perpetrator or victim. Second, this analysis has reinforced the idea that bullying is not simply senseless cruelty, engaged in for fleeting laughs. Rather, it can have lasting, positive consequences for the bully's social prospects. One challenge for prevention, then, is to redefine bullying into something that is uncool. To do this will require interventions that reach not just bullies, but their audiences, the majority of students who are not directly involved in bullying. These are the ones who reward aggression. Fortunately, coolness is a fragile thing—what is cool one day is out the next,

what is fashionable in one school may not be in another. We need prevention efforts that will

help make bullying always "out."

CHAPTER 4

WHO NEEDS ENEMIES? THE ROLE OF RACE, STATUS, AND SOCIAL DISTANCE IN BULLYING RELATIONS

I. Introduction

Two decades ago, a review of our sociological understanding of race relations in the United States noted agreement that things have changed, but that "no overarching sociological perspective has emerged to explain these changes" (Pettigrew, 1985, p. 329). This was due, in part, to the increased complexity of race relations, brought about largely by the Civil Rights movement. While overtly racist attitudes have dwindled, other indirect forms of discrimination have persisted. By the mid-1980's, there had been significant progress, in minority voting registration and educational attainment, for instance, but significant disparities remained (Pettigrew, 1985). Today, those trends have continued: minority students continue to erode the educational attainment gap, and aspirations for post-secondary education are high among all racial and ethnic groups (Kao and Thompson, 2003). At the same time, significant problems remain: African-Americans, Latinos, and Native Americans are all significantly more likely than Whites to attend poor schools and to drop out of high school (White and Kaufman, 1997).

In addition to persistent academic inequalities and disparities between whites and minorities, the social organization of schools has been of concern to researchers and

policymakers alike. While the *Brown v. Board of Education* decision desegregated schools, it was not able to desegregate the social circles in their hallways, cafeterias, and locker rooms. Research has consistently shown that homophily in friendship, the principle that people befriend similar others, is stronger with respect to race than any other broad demographic category (McPherson et al., 2001). Just 15 percent of American adults have any racial heterogeneity among their close ties (McPherson et al., 2006). Given the established importance of peer influence, such social homogeneity could exacerbate existing patterns of lower achievement among minorities (Crosnoe et al, 2003). For this and other reasons, scholars have begun to examine the conditions under which desegregation of schools can lead to integration of friendship groups (Moody, 2001).

The specific mechanisms that produce such racial homogeneity are difficult to pinpoint. Certainly propinquity, the tendency for people to befriend those they happen to spend more time with, plays a substantial role, but friendship homogeneity is substantially greater than would be expected by chance alone (e.g., Moody, 2001). While overt racism has receded over the past fifty years [for example, in 1942, just 42 percent of Whites thought "Blacks should have as good a chance as White people to get any kind of job," compared to 92 percent in 1972 (Pettigrew, 1979)] racial discrimination has instead become indirect and more difficult to either observe or analyze (for a review, see Winant, 2000). It does not suffice to simply ask direct questions on surveys, as many will deny their racial biases, even as they reveal them subtly (Bonilla-Silva and Forman, 2000). These prejudices may help explain racial homogeneity in the friendship circles of adolescents and adults.

While we already know much about the patterns of friendship ties among adolescents, much less is known about relations among students who are *not* friends; this gap is especially significant given that, in typical friendship networks, the vast majority of pairs of students are not directly linked.[28] So how do we understand the absence of friendship? On the one hand, pairs who are not themselves friends, but who are socially close may have amicable relations, and friends of friends often become friends, as suggested by balance theory (Heider, 1946), and empirically demonstrated in American middle and high schools (Moody, 1998). On the other hand, the absence of a friendship tie could also imply animosity: having two friends who are not themselves friends may entail rivalries, and has been shown to create psychological strain that can lead to suicidal thoughts (Bearman and Moody, 2004). It cannot be discerned, using typical friendship network data, whether the absence of friendship implies amicability, neutrality, or animosity.

Unfortunately, data on negative relations are extremely rare, particularly in the context of schools. To the author's knowledge, no network data on negative ties have been collected in American schools. Considering the increasing scholarly (and administrative) attention paid to racial integration and racial climate in schools, a better understanding of negative relations is required. Here I present data on one relatively general form of negative relation, bullying, and consider factors from these different domains.

In addition to informing our understanding of race relations among adolescents, this analysis is also motivated by concern over a serious social problem. Estimates of bullying

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[28] This is partly due to survey design, which often restrict friendship nominations to five or seven. However, even studies with unlimited nomination possibilities find that the majority of dyads are not friends (e.g., Moody and Paxton, 2003).

prevalence suggest that at least 17 percent of American schoolchildren are bullied annually (Nansel et al., 2001). The consequences of bullying are serious: being victimized by bullies is significantly positively related to suicidal ideation (Rigby and Slee, 1999, Kaltiala-Heino et al., 1999; Carney, 2000; Owens et al., 2000), social isolation (Nansel et al., 2001; Hay et al., 2004; Hodges and Perry, 1999), anxiety and depression (Schafer et al., 2004; Olweus, 1993; Callagan and Joseph, 1995; Neary and Joseph, 1994; Baldry, 2004; Dill et al., 2004), low self esteem (e.g., Olweus, 1993; O'Moore and Kirkham, 2001; Karatzias et al., 2002), physical health problems (Ghandour et al., 2004), and diminished academic performance and school attachment (Woods and Wolke, 2004; Eisenberg et al., 2003).

Bullying is inherently relational, involving perpetrators and victims. However, to the author's knowledge, only one study, of Dutch four-year olds, has analyzed bullying from a network perspective (Vermande et al. 2000). While some studies rely on peer nominations to determine who bullies and who does not, virtually all examine bullying as a behavior of an individual, not as a relationship. Much has been learned, but these analyses cannot tell us, for example, whether bullying is more likely to occur between kids of different races, or whether boys are more likely to bully girls than girls are to bully boys.

It is important to clarify that while bullying (as defined below) is quite general and includes a wide range of behaviors, such as punching, teasing, ostracism, and rumor-mongering, *it is not the opposite of friendship*. If we simply wanted to clarify the meaning of the absence of a friendship tie in a network, as indicative of neutrality or animosity, it might be more appropriate to ask kids who their enemies are. Examining bullying relations cannot

tell us these things, and we cannot simply take what is known of friendship relations, reverse the propositions, and apply them to bullying. This analysis is an initial exploration of bullying as a network relation that is distinct from, but not simply the opposite of, friendship, and is guided by diverse research on friendship patterns, race, and bullying. *The purposes of this paper are: a) to examine the effect of racial similarity on bullying and explore whether that effect is modified by racial diversity; b) to consider structural factors that make bullying more likely; c) to determine how status differences affect the likelihood of bullying at the dyadic level.*

Before continuing, it is worth pointing out that dyadic models use ordered pairs of actors,[29] include all possible pairs of students, and model the likelihood of a tie. Often the first actor in an ordered pair is referred to as the sender and the second is the receiver. The dyadic models of bullying in this analysis control for the number of students the sender bullied and the number of students who bullied the receiver. As such, all the factors that make an individual more likely to bully in general, such as family conflict, status insecurity, or low school attachment, should already be accounted for by including the number of students the sender bullies. Similarly, the factors that make the receiver more likely to be bullied in general are also accounted for. Because of this, these models focus on the characteristics of the *dyad*, not the individuals composing it, and include the combined demographic characteristics of the pair,[30] the social status differences between them, and the structural connections which link them.

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[29] For example, the pair Adam-Billy is included in the data along with the pair Billy-Adam.

[30] For instance, the dyadic effect of race can be seen by looking at white-white pairs compared to white-black pairs, etc.

II. Race and Bullying

Research on bullying has tended to define it as "engaging in negative actions against a less powerful person repeatedly and over time" (Olweus, 1999; Kaukiainen et al., 2002). However, observing and measuring the relative power of schoolchildren is complicated, and in practice, the definition is circular—if someone is being repeatedly victimized, they are less powerful. Additionally, if one student harasses many other students, but only one time each, this would be excluded from the definition of bullying.

Accordingly, I abandon the relative power aspect of the definition, or rather, accept the circular logic of victimization implying power inequity, and focus instead on victimization itself. I also relax the requirement of repeated victimization, acknowledging that a student may pick on her peers regularly, but no single student on a frequent basis. Therefore, I define bullying as a situation, however brief, where a perpetrator harms a victim who is a peer, using physical (hitting, tripping, etc.), direct verbal (name-calling, threats of violence), or indirect (rumor-mongering, ostracism, etc.) aggression, and in a context of a continued relationship.

The literature on school bullying has largely ignored the role of race in either predicting bullying behavior or in accounting for variation in its consequences (for exceptions, see Graham and Juvonen, 2002 and Nansel et al., 2001). However, where race is considered, it often matters: in one study, African-American students were significantly more likely than others to bully their peers (Graham and Juvonen, 2002), while another found that Whites experienced more harassment than Blacks (Eisenberg et al., 2003). Additionally,

Nansel et al. (2001) found that one-quarter of American students who were ever bullied were specifically belittled about their religion or race. However, self-reports by victims are limited in that they reveal only overtly racial bullying. This analysis will not be limited by perceived motives (nor will it be able to discern motive at all) and will be able to detect whether students tend to bully students of other races even when the abuse is not overtly racist.

While there is a dearth of research on interracial bullying, we can turn to analyses of interracial friendships for insights. While the Supreme Court mandated that schools be race-blind, students are not, and homophily, the principle that people tend to befriend similar others, is a dominant feature of adolescent friendship networks (e.g., Tuma and Hallinan, 1979; Hallinan and Williams, 1989). Because of this and structural factors such as tracking, the friendship circles of adolescents in the US are often racially homogenous (Clotfelter, 2002).

The first question, then, is whether bullying is more or less likely to occur among same-race or mixed race pairs. One approach is to naively presume that bullying and friendship are mutually exclusive, and that the absence of friendship at least makes the presence of bullying more likely. If so, we could then derive hypotheses from the literature on adolescent friendship, and would expect bullying to occur between races more often than within racial groups. A second approach is to ignore the *content* of the relations for a moment, forgetting that friendship is positive and bullying is negative, and consider both as

forms of social interaction. In this case, we would expect bullying to follow the patterns of friendship, rather than reverse them.

There are at least two reasons to adopt the latter approach. The first reason is propinquity. Residential segregation, differential rates of participation in extra-curricular activities, and academic tracking may inhibit opportunities for students of different races to interact at all, for good or ill. Secondly, when bullying does occur between kids of different races, it raises the specter of generalized conflict between racial groups, as occurred at Jefferson High School in Los Angeles in 2005. Roger Gould (2003) showed that collectivities have an interest in clearly demonstrating their solidarity, and so seemingly isolated conflicts between individuals can quickly spiral into large-scale collective violence. Therefore, based on the consistent findings of homophily among adolescents, I hypothesize the following:

Hypothesis 1: *Bullying is more likely to occur among same-race pairs compared to mixed-race pairs.*

There are just a few network studies of interracial friendship and racial diversity in American schools. In each case, the outcome of interest is the likelihood of friendship between two students of different races. Joyner and Kao (2000) find that students in schools with greater proportions of students of their own race are less likely to make cross-race friendships. Moody (2001) also examines diversity and integration and his findings largely support Joyner and Kao's (2000) in that diversity is for the most part inversely related to

106

integration.[31] Only at the highest levels of diversity does in-group preference begin to decline (Moody, 2001).[32] This is contrary to Blau's (1977) proposition that heterogeneity increases the probability of interaction beyond mixing opportunities.

On the other hand, other theoretical work on race and interracial aggression predicts that interracial violence will increase with diversity. Specifically, Blalock (1967) argues that county lynching rates will accelerate as percent black increases, a finding borne out in empirical studies (e.g., Reed, 1972; Corzine et al., 1983). While interracial violence might seem to offer a good model for understanding interracial bullying, there is a qualitative difference between the violence of lynching, in which there is often little or no social connection between perpetrator and victim and where there are also symbolic objectives, and bullying, which occurs in the context of continued relations and is obviously less severe. Because of this, I abandon the analogy of interracial bullying to lynching and maintain that bullying will follow the patterns of friendship, which suggests the following:

Hypothesis 2: *Same-race dyads in diverse schools will be more likely to involve bullying than same-race dyads in less diverse schools..*

Propinquity

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[31] Moody defines diversity as the probability that a randomly selected pair of students will be of a different race, and integration as the extent to which students have friends of different races, after accounting for chance and propinquity.

[32] In contrast, Quillian and Campbell (2003) found that own-group preference is *inversely* related to the proportion of students of the same race. Both Moody and Quillian and Campbell use the Add Health dataset, so their divergent results are most likely explained by the fact that Quillian and Campbell do not include as many controls for propinquity, nor do they include structural controls typical of p* models. It also is unclear whether they included the main effect of diversity in their models. For these reasons, I have greater confidence in Moody's findings.

Much of the work on adolescent friendship has considered the effects of propinquity—the fact that students are more likely to befriend students with whom they spend more time with (Festinger et al., 1950; Quiroz et al., 1996). In keeping with the above, my expectation is that bullying is more likely between pairs of students who participate in extra-curricular activities together and who live in the same neighborhoods.

Hypothesis 3: The likelihood of bullying increases if the pair of students live in the same neighborhood and with the number of extracurricular activities they have in common.

Gender

Gender also organizes social life in powerful ways, but gender interaction follows a different logic than race, where factors like relative group size and propinquity are primary forces behind homophily along with in-group preferences. This is because men and women are represented in equal proportions, and, among adults at least, are deeply integrated socially. Most adults have close confidants of the opposite gender (McPherson et al., 2006). Propinquity and relative group size are less salient for gender relations, so same-sex friendship patterns are largely a product of preference rather than structural considerations. Among school-aged children and adolescents, cross-gender friendships are unusual; in fact, when faced with an intransitive triad, most youths would rather drop a same sex friend than add a friend of a different gender (Tuma and Hallinan, 1979). In terms of bullying relations, the literature suggests that boys are more aggressive in general (e.g., Olweus, 1993; Boulton and Smith, 1994).[33] As such, I propose:

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[33] It is possible that the indirect bullying more often perpetrated by girls is not reflected in these analyses (Underwood et al., 2001).

Hypothesis 4: Bullying will be most likely to occur within gender; however, boys will bully girls more often than girls will bully boys.

Friendship and Social Distance

One question that has no parallel in the interracial friendship literature is how bullying is related to social distance, defined as the number of friendship links separating any given pair of actors. Social distance is important to consider in this analysis because Black and White students (and, to a lesser extent, Asians, Latinos, and Native Americans) tend to be friends with students of the same race/ethnicity, creating greater than average social distance between students of different races, and it is therefore possible that the social distance effect may confound the effect of being a mixed-race pair.

Again, if we take the naïve view that bullying can be understood as the opposite of friendship, then we would first hypothesize that bullying is unlikely to occur among friends. And, given the prevalence of transitive relations in adolescent friendship networks—the finding that, if *a* is friends with *b*, and *b* is friends of *c*, then *a* is friends with *c* more often than would be expected by chance alone (e.g., Moody, 1998; Doreian et al., 1996; Hallinan and Kubitschek, 1990;)—we might also expect that students are unlikely to bully their friends' friends (those with a social distance of 2). Even though the victim is not a friend, bullying the friend of a friend may generate strain in the initial friendship. By this logic, we would expect social distance to be positively related to bullying, and that bullies and their victims would tend to occupy different social spheres.

However, this naïve approach is based on a questionable assumption, that bullying and friendship are opposing relations. Critique of this premise goes back at least as far as Simmel's (1950, 1971) classic descriptions of relations among dyads, which argued that friendly, intimate relations are complicated by animosity and domination. More recently, Gould (2003) argued that conflicts between equals, and particularly when there is ambiguity about social rank, are more likely to spiral into deadly confrontations than conflicts between people of differing social status. Domination is virtually built into friendship:

Take any two people at random, and it is unlikely that they will match exactly in the degree to which they appeal to each other as friends…even if they do form a friendship, the asymmetry in the relationship will…consistently make one party to the relation feel neglected and cause the other to feel crowded if the former demands more attention. (Gould, 2003, pp. 48).

This incongruence in demand for friendship provides the foundation for domination, but it is when dominance is renegotiated, for example, when one friend contradicts the other publicly, that conflict can emerge and spiral out of control. Gould's argument suggests the following:

Hypothesis 5: Bullying will be more common between friends than non-friends, and a bullying tie from A *to* B *will be most likely when only* B *nominates* A *as a friend, less likely when only* A *nominates* B *as a friend, and the least likely when the friendship is mutual.*

While there are reasons to expect bullying to occur between friends, the friendship may be more difficult to maintain even if bullying occurrences are rare. Additionally, there is reason to anticipate high rates of bullying among dyads that are not friends, but which are

socially close. If A is a socially desirable friendship "target", and B and C are both friends with A, then B and C may be considered rivals for A's affections. More generally, if bullying is instrumental toward gaining status within the peer group, we might expect bullies to target those within their social circle. Such displays of dominance may be more compelling than picking on social isolate or someone in a completely different friendship circle. Because of this, I expect:

Hypothesis 6: In general, bullying will have an inverse relationship to social distance. However, dyads who are socially close but not friends may have a higher rate of bullying than friends.

Bullying Network Factors

Thus far, I have frequently drawn on the existing theories and empirical analyses of friendship networks to craft hypotheses concerning bullying, mostly by arguing that bullying and friendship are not opposite relations, but are both just elements of social interaction. However, there are conceptual limitations to this approach. Even acknowledging the imbalances that Gould argues lead to domination, friendship is at least partially reciprocal. If there is fundamental disagreement about the presence of friendship between two people, an observer would probably not label the relationship as friendship—perhaps unrequited affection or idolization. In practice as well, researchers typically find rates of friendship reciprocity much greater than chance alone would dictate.[34]

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[34] However, reciprocity rates are perhaps not as high as one might expect: in the Contexts data, reciprocity rates vary between 50 and 60 percent for best friend nominations.

Bullying, on the other hand, is not conceptually a reciprocal, undirected relation, but a directed one, from bully to victim. Of course, mutual aggression does occur. Victims occasionally stand up to bullies. Tables can turn. But for the most part, bullying is something one student does to another and does not in turn receive back. The specific wording of the bullying nomination item was designed to capture this directionality—it asks for those who pick on or are mean to you, not those with whom you fight or have conflict. Because of this, I do not anticipate high degrees of reciprocal bullying between students.

Hypothesis 7: *bullying relations are not likely to be reciprocated—if* A *picks on* B, B *is unlikely to pick on* A.

I have already considered the consequences of transitivity in the friendship network, but we can apply the same theory of social balance to negative relations as well. Balance theory suggests that a friend of a friend is a friend, but it also proposes that an enemy of a friend is an enemy, a friend of an enemy is an enemy, and an enemy of an enemy is a friend (Davis, 1963). Again, unlike friendship and "enemyship," bullying is an inherently directed relation, between a bully and a victim. As such, we cannot simply substitute "bully" for "enemy" in the above statements. An enemy of an enemy may be a friend, but a bully of a bully is probably a bully. Specifically, if Adam picks on Bill, and Bill picks on Charlie, we would expect Adam to pick on Charlie too. This last proposition was supported in a network study of aggression among young schoolchildren in Holland, which found significantly greater than expected levels of transitivity in aggressive relations (Vermande et al., 2000). Similarly, we may expect bullying to be less likely to occur when it would create intransitive

triads: if Bill is picking on Charlie, and Adam is not picking on Charlie, Adam also may be less likely to pick on Bill.[35]

Hypothesis 8: the networks of bullying should exhibit significant amounts of transitivity: if A *picks on* B *and* B *picks on* C, *then* A *also picks on* C. *Intransitivity is expected to be negatively related to bullying.*

If we combine transitivity and the absence of reciprocity a third hypothesis is suggested: that bullying is not cyclic. If Adam picks on Bill, and Bill picks on Charlie, we do not expect Charlie to then pick on Adam. This is also consistent with literature on hierarchies and animal pecking orders (e.g., Mazur, 1973; Schjelderup-Ebbe, 1935).

Hypothesis 9: The networks of bullying should have lower levels of cyclicity than expected by chance: if A *picks on* B *and* B *picks on* C, *then* C *is unlikely to pick on* A.

Friendship Network Factors

The bullying network is not the only dimension on which aggressive behavior may be structured: patterns of relations in the friendship network may have an even stronger effect on bullying relations, as they are probably of greater duration. Gould's (2003) argument about ambiguity in social status provides some guidance here. Gould demonstrates that ambiguity about the relative social rank of two people may breed and exacerbate conflict,

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[35] However, there may be a countervailing tendency to establish intransitive triads, depending on how hierarchical bullying is: if Bill and Charlie do not pick on each other, Adam may create an intransitive triad simply by picking on them both—a not uncommon scenario.

allowing trivial disagreements to turn fatal as the contest centers not on the argument itself but on social standing.

Here, I test the idea using the structure of friendship relations. Certain triad arrangements may create ambiguities as to status, specifically, transitivity and cyclicity. If Abby is friends with Betty, and Betty is friends with Catherine, Abby could view Catherine as a rival, and seek to ostracize her. This situation is reflected by the measure of friendship transitivity, defined as the number of transitive triads that would be created if the sender was to nominate the receiver as a friend.

However, if we reverse one of the friendship ties such that Betty likes Abby and Catherine likes Betty, we find a very different situation, characterized by a measure of cyclicity. Here, as before, Catherine is socially close, but now is of distinctly lower status rather than a rival. In both cases, however, we might expect Abby to victimize Catherine. Accordingly, I hypothesize:

Hypothesis 10: Potentially transitive triads and potential cycles in the friendship network are more likely to involve bullying.[36]

Status

In the adolescent realm the specific markers of status may include popularity, physical attractiveness, pubertal development, athletic prowess, comedic ability, and fashion, among

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[36] I use the term "potentially" because these measures are indicators of how many transitive triads and cycles *would* be created if A was to nominate B as a friend—but the number actually involved depends on whether A did in fact nominate B as a friend. The

others. Though there are many others, these are among the primary dimensions of cool.

There are two competing ideas about the role of status, one suggesting that the more popular

students will pick on the less popular ones, the second suggesting that bullying is more likely

to occur between status equals.

In the case of the former, Hawley's social dominance theory (1999) proposes that

aggression is a tactic used by stronger students against weaker ones in order to make further

gains in relative social standing. As such, the theory predicts a positive relationship between

bullying and popularity, although in practice the reciprocal nature of these variables makes it

difficult to determine causal priority. Research has shown that bullies are indeed more

popular (Bjoerkqvist, Oesterman, Lagerspetz, Landau, Caprara, Vittoro, and Fraczeck, 2001;

Olweus, 1993), and tend to have larger friendship groups (Huttunen et al., 1996). Also

consistent with social dominance theory, victims are more likely to experience isolation and

peer rejection (e.g., Graham and Juvonen, 1998; Hay et al., 2004; Hodges and Perry, 1999).

However, there is also evidence to support the proposition that bullying is more likely

to occur among status equals. First, Gould's work on violence (2003) shows that violent

conflict is more likely to arise between status equals. Additionally, analysis of the *Context*

data (chapter 2), has found that bullies tend to come from the *middle* of the popularity

percentiles, and the most popular students are also the least likely to bully others, on

average.[37] This in itself does not demonstrate the conflict-from-equality argument, but is consistent with it. I test these two competing ideas as follows:

Hypothesis 11: *The gap between the sender's and receiver's popularity will be positively related to bullying; the absolute difference between sender's and receiver's popularity will be negatively related to bullying.*

Prior research has also suggested that bullies tend to be more physically developed while victims tend to be less so (e.g., Olweus, 1993; Batsche and Knoff, 1994). Research has also shown that victims of bullying tend to be less attractive than others (Sweeting and West, 2001), and similarly, that bullies are more attractive (Pelligrini and Bartini, 2001). Accordingly, I hypothesize:

Hypothesis 12: The difference between the sender's and receiver's pubertal development will be positively related to bullying.

Hypothesis 13: The difference between the sender's and receiver's physical appearance will be positively related to bullying.

III. Data and Methods

The Contexts of Adolescent Substance Use

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[37] The differences may be due to different sample populations, or it is possible that if earlier studies had tested for nonlinearity, they might have found that the positive effect of popularity on bullying tapers off and reverses itself at the highest ranges of popularity.

The Contexts of Adolescent Substance Use study (hereafter, Contexts) is a longitudinal survey of all middle and high school students in three counties in North Carolina. The focus of Contexts is on alcohol, tobacco, and drug use, but it collects information on a wide range of other topics as well. The three counties were selected based on willingness to participate and proximity to Chapel Hill, North Carolina, where data collection and management occur. The biannual survey, administered in schools, began in the spring of 2001 with wave 1; wave 5 data was collected in the spring of 2004. After wave 5, Contexts continues with two additional annual surveys (Wave 6 was administered in the fall of 2004, wave 7 was administered in the fall of 2005), which means that the oldest cohort has been followed through high school.

At wave 1, all public school students in grades 6, 7, and 8 for each county were asked to participate, resulting in over 5,000 participants divided among 29 grade/class networks. The response rate has been maintained at or above 80% for the five waves of data which have already been collected.

In addition to questions concerning substance use, aggressive behaviors, academic performance, depression, dating violence, school attachment, suicidality, physical development, family life, and neighborhood characteristics, the survey asks students to nominate up to five of their best friends. Beginning in waves 4 and 5, the survey adds questions asking students to nominate up to five students whom they "are mean to or pick on" and up to five students who are mean to or pick on the respondent. In addition to naming

the peers who are bullies and victims, the survey also asks questions regarding the manner of bullying and the frequency with which it occurs.

The Context study also interviews one parent annually for a subsample of students, asking questions about substance use, parenting style, and household composition. Finally, the home address of each student was geo-coded, allowing the study to link to geographic datasets which provide important information about neighborhood setting.

Dependent Variable

The unit of analysis here is not the individual student, as in most analyses of bullying behavior. Instead, I examine all possible directed *pairs* of students in each of the networks, which results in n*(n-1) dyads.[38] The dependent variable is a binary indicator of whether the first student (or "sender") bullied or picked on (using the above "mean to or picked on" network nominations) the second ("receiver"). To mitigate underreporting bias, I consider a bullying tie from A to B to be present if either A nominated B as someone she picks on, *or* if B nominated A as someone who picks on him.

Independent Variables

Race: Because of low frequencies, the racial categories used are White, Black, and other. The analysis begins by using a set of dummy variables for all possible racial combinations (sender→reciever): White-White (reference), White-Black, White-other, Black-Black, Black-White, Black-other, other-other, other-White, other-Black. These are

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[38] Each pair of students is therefore represented twice in the dataset, once as A→B and again as B→A.

ultimately collapsed into a single dummy variable indicating whether the dyad is of the same race.

Diversity. I measure diversity at the network level using Moody's (2001) definition, where diversity is the probability that any two randomly selected pairs of students will be of a different race. I also test hypotheses using the percent black in the school.

Social Distance: Social distance is the number of friendship links[39] separating the pair of students. For example, direct friends have a social distance of 1, friends of friends a distance of 2, etc. All networks have isolates, however, no network has more than one large component—in other words, the only disconnected nodes are isolates (or, rarely, isolated dyads). When the two actors are not connected, they are given a social distance score of ten, which is one greater than the observed maximum distance.

Propinquity: Propinquity is measured in two ways, first with questions concerning extra-curricular activities. Students are asked whether they participate on sports teams, newspaper or yearbook, service clubs, honor societies, and drug awareness groups. I include the number of these activities in which both the students are involved. Second, geographic propinquity is captured by a binary indicator of whether the two students lived in the same block group.[40]

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[39] For this measure, the friendship network is symmetrized such that A and B are considered friends if either A nominates B, or B nominates A.

[40] This variable was imputed for cases where one of the students' residence could not be established.

Reciprocity: Reciprocity is a binary indicator of whether a tie from the sender to the receiver would create a reciprocal relationship; it is therefore an indicator of whether the receiver has bullied the sender.

Transitivity and Intransitivity: A transitive triad is one where, given that A nominates B and C, that B also nominates C. I include transitivity measures derived from both the bullying network (bullying transitivity) and the friendship network (friendship transitivity). Bullying transitivity is the number of transitive bullying triads that *would* be created if the sender picked on the receiver. Friendship transitivity is the number of transitive friendship triads that would be created if the sender nominated the receiver as a *friend*. Bullying intransitivity is the number of intransitive triads that would be created if the sender picked on the receiver; friendship intransitivity is the number of intransitive triads that would be created if the sender nominated the receiver as a friend.[41]

Cyclicity: A cycle is a triad in which A nominates B, B nominates C, and C nominates A. Bullying cyclicity is the number of cycles that would be created if the sender in the pair picked on the receiver. Friendship cyclicity is the number of cycles that would be created if the sender nominated the receiver as a friend.

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[41] There is a subtle difference in these measures: for bullying, we are using the potential number of transitive triads to predict the presence of a tie; for friendship transitivity, we are also using the potential number of transitive triads to predict the presence of a bullying tie, but we can also include an indicator of whether those triads were, in fact, created by a friendship tie. In practice, however, it does not affect the friendship transitivity coefficients (or any others) if we interact sender→receiver friendship with friendship transitivity (and the interaction is also insignificant when controlling for the main effect of sender→receiver friendship). The same pattern holds for intransitivity and cyclicity.

Friendship. I use a set of three dummy variables for friendship status (the reference is not friends): sender→receiver (sender nominates receiver as a friend), receiver→sender (receiver nominates sender as a friend), and mutual friends.

Popularity: The popularity gap is measured first by calculating normed betweenness centrality: a node's normed betweenness centrality is defined as the proportion of all geodesics (the shortest path between a pair of students) that include that node. Because this measure, even though normalized as a proportion, is nonetheless sensitive to network size, I further adjusted it by transforming it into a percentile. The most popular student in the network is in the 100th percentile, and isolates have popularity of 0. Finally, to obtain the popularity gap, I subtract the receiver's popularity percentile from the sender's popularity percentile; a high positive score therefore indicates that the sender is more popular than the receiver. Popularity difference refers to the absolute value of the popularity gap.

Friendship Gap and Friendship Difference. A second way of measuring popularity is to simply use friendship indegree, or the number of students who name ego as a friend. Friendship gap is therefore sender's friendship indegree – receiver's friendship indegree. Friendship difference is the absolute value of the friendship gap.

Puberty: Puberty was measured using an abbreviated version of Peterson et al.'s (1988) scale, which includes somatic assessments of pubertal maturation: body hair growth (any place other than head), changes in skin (such as pimples), and growth in height (growth spurt). The response scale for all items was: 0 = "not yet started", 1 = "barely started", 2 = "definitely started", and 3 = "seems complete" I estimated a latent variable measurement

model in MPLUS. Model fit was good (RMSEA=0.018; CFI=0.985; TLI=0.982;

SRMR=0.018), and factor scores were output. The pubertal gap measure is calculated by

subtracting receiver's pubertal development from that of the sender's.

Appearance: Appearance was calculated as the simple average of two items: "most

of the time I am happy with the way I look; and "I am proud of my body." Response

categories were "strongly agree," "agree somewhat," "disagree somewhat," and "strongly

disagree." As with the other gap measures, I subtract the receiver's appearance score from

that of the sender's.

Structural Controls. To control for the monadic propensities to bully and to be

victimized, I include sender's bullying outdegree (the number of others that the sender

bullies), sender's indegree (the number of students who pick on the sender), and receiver's

outdegree and indegree.

Methods

To model the presence of a bullying tie between two students, I use an exponential

random graph model based on the P* modeling framework developed by Wasserman and

Pattison (1996; 1999). I first transform each of the school networks into a set of N(N-1)

dyads, where Y_{ij}=1 if there is a bullying tie from i to j and 0 otherwise. I then apply SAS

IML modules developed by James Moody (2001) to calculate the structural parameters

(transitivity, intransitivity, etc.).[42] These structural parameters were generated by first

calculating the statistic when the tie from *i* to *j* is forced to be absent, then calculating the

same statistic when the tie is forced to be present, and subtracting the former from the latter.

However, in practice it is computationally intensive to calculate these structural parameters,

and several networks took weeks to analyze. Computing time is geometrically related to

size, so 5 of the 19 networks were unable to be included because of their size.[43]

Initially, models were estimated as cross-classified hierarchical mixed models, using

the Proc Glimmix option in SAS 9, with random intercepts at both the school and

neighborhood levels and no random slopes. However, the cross-classified models would not

converge, so I then estimated hierarchical models with random school and neighborhood

intercepts separately. Neither random intercept ever approached statistical significance

individually, so I estimate a logit with the pooled sample. Formally, the model is a logistic

regression described (here using the baseline model) as

$$Log\left(\frac{p(Y_{ij} = 1)}{p(Y_{ij} = 0)}\right) = b_0 + b_{1-8}N_{ij} + b_9 Activities + b_{10-12}S_{ij} + b_{13}Samerace + b_{14}Diversity + e_{ij}$$

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[42] Following Moody (2001), rather than include individual level fixed effects for expansiveness and attractiveness (traditionally included in the P* model), which would result in 2N, or over 5 million additional variables, I include sender's and receiver's outdegree and indegree.

[43] Besides their larger size, the excluded networks included older students and had slightly lower levels of bullying (a mean difference in bullying outdegree of .39). However, the excluded networks were nearly identical to the subsample with respect to gender, race, family structure, and SES, and there were no significant differences for the other independent variables. Furthermore, models of bullying outdegree showed no significant differences between the two samples.

Where b_0 captures network density, N is a set of structural variables (sender outdegree, sender indegree, receiver outdegree, receiver indegree, reciprocity, transitivity, intransitivity, and cyclicity), "Activities" is a count of the number of extracurricular activities both members of the dyad are involved in, "Samerace" is a binary indicator of whether the pair is of the same racial background or not, "Diversity" is the probability that any two randomly selected students in the school will be of the same race, and e_{ij} is a dyadic error term.

Missing data are often a problem, but are particularly so in models of dyads: if 25 percent of the respondents are missing on a variable, in dyad form this translates into the loss of 44 percent of the data. Accordingly, prior to merging with the dyadic data, I used missing data imputation in SAS 9 on the individual respondents. All models are analyzed using proc mianalyze in SAS 9.

IV. Results

Table 4.1 displays descriptive statistics for all dyads included in the analysis, and contains a few noteworthy findings. First, these networks are sparse: out of one thousand dyads, just slightly more than three will involve bullying, and 17 will involve some form of friendship (either directed or reciprocated). Sparseness is partly by design, as the survey limits the number of friendship nominations to five, and (given the maximal symmetry) the number of bullying nominations to ten. However, the actual bullying rate is just 11 percent of the maximum possible, which is slightly more than 21 per thousand dyads. The observed friendship rate is 46 percent of the maximum possible of nearly 11 per thousand dyads. Reciprocity rates are fairly similar between bullying and friendship: 23 and 29 percent of all

124

bullying and friendship relationships are reciprocated, respectively. Half of all dyads are

mixed gender, and slightly more than half of all dyads involve students of different races.

Table 4.1: Descriptive Statistics of Dyads

Variable	Mean	S.E.	Min.	Max.
Sender's bullying outdegree	0.90	1.43	0.00	9.00
Sender's bullying indegree	0.90	1.67	0.00	17.00
Receiver's bullying outdegree	0.90	1.43	0.00	9.00
Receiver's bullying indegree	0.90	1.67	0.00	17.00
Bullying reciprocity	0.00	0.06	0.00	1.00
Bullying cyclicity	0.01	0.21	0.00	9.00
Bullying transitivity	0.02	0.18	0.00	9.00
Bullying intransitivity	1.74	2.15	-1.00	25.00
Number of shared activities	0.59	0.82	0.00	6.00
Male?male	0.25	0.42	0.00	1.00
Male?female	0.25	0.43	0.00	1.00
Female?male	0.25	0.43	0.00	1.00
Female?female	0.25	0.42	0.00	1.00
White?white	0.25	0.44	0.00	1.00
White?black	0.14	0.35	0.00	1.00
White?other	0.05	0.22	0.00	1.00
Black?white	0.14	0.35	0.00	1.00
Black?black	0.20	0.40	0.00	1.00
Black?other	0.04	0.19	0.00	1.00
Other?white	0.04	0.19	0.00	1.00
Other?black	0.03	0.17	0.00	1.00
Other?other	0.01	0.10	0.00	1.00
Same race	0.46	0.50	0.00	1.00
School diversity	0.49	0.08	0.35	0.84
Sender's friendship indegree	2.93	2.56	0.00	17.00
Sender's friendship outdegree	2.93	2.02	0.00	5.00
Receiver's friendship indegree	2.93	2.56	0.00	17.00
Receiver's friendship outdegree	2.93	2.02	0.00	5.00
Friendship reciprocity	0.00	0.06	0.00	1.00
Friendship transitivity	0.11	0.51	0.00	12.00
Friendship intransitivity	5.57	3.23	-1.00	22.00
Friendship cyclicity	0.09	0.60	0.00	15.00
Friendship distance	3.31	1.90	0.00	10.00
Sender nominates reciever as a friend	0.12	0.33	0.00	1.00
Receiver nominates sender as a friend	0.03	0.18	0.00	1.00
Mutual friendship	0.14	0.35	0.00	1.00
Friend gap (sender-receiver)	0.00	3.58	-17.00	17.00
Puberty gap (sender-reciever)	0.00	0.44	-2.00	2.00
Appearance gap (sender-receiver)	0.00	1.12	-3.00	3.00
Popularity gap (sender-receiver)	0.00	3.58	-17.00	17.00
Friend difference (absolute value)	2.69	2.36	0.00	17.00
Popularity difference (absolute value)	11.66	17.28	0.00	100.00
N=761,558 dyads				

Table 4.2 presents results from regression models of network and demographic characteristics. First, I consider the structural features that are common to all models (model 1). As expected, sender's bullying outdegree and receiver's bullying indegree are highly significant; sender's bullying indegree and receiver's bullying outdegree, however, are not.[44] In model 1, contrary to hypothesis 7, reciprocity has a strong positive relationship to bullying: if the receiver in a pair bullies the sender, the sender is over 100 times more likely to bully the receiver. The cyclicity parameter is also positive, contrary to hypothesis 9. Transitivity is positively related to bullying, supporting the first part of hypothesis 8; intransitivity, though negative as expected, is not significantly related to bullying. Surprisingly, the number of shared activities is not significantly related to the likelihood of bullying.[45] However, pairs of students who live in the same neighborhood are 27 percent more likely to bully one another.

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[44] I include the latter two variables just as a precaution—theoretically, their effects should be absorbed by the effects of sender's outdegree and receiver's indegree.

[45] I also tested shared activities separately (both in sports, both in yearbook, etc.): only both in honors was significant and positive, while two other indicators (both in yearbook and both in service clubs) were significant and *negative*. In any case, I use the number of shared activities because I want to control for the amount of time the pair is in each other's company, not what they are doing during that time. However, controlling for activities individually had no substantive effect on the results.

Table 4.2: Logistic Regression of Bullying on Race and Diversity

Variable (Sender → Receiver)	Model 1 β	SE	Model 2 β	SE	Model 3 β	SE	Model 4 β	SE
Intercept	-7.20 ***	0.06	-7.68 ***	0.06	-8.72 ***	0.15	-8.61 ***	0.22
Sender bullying outdegree	0.57 ***	0.01	0.57 ***	0.01	0.58 ***	0.01	0.58 ***	0.01
Sender bullying indegree	-0.11 ^	0.06	-0.11 *	0.06	-0.09 ^	0.06	-0.09 ^	0.06
Receiver bullying outdegree	0.01	0.06	0.00	0.06	0.03	0.06	0.03	0.06
Receiver bullying indegree	0.36 ***	0.01	0.36 ***	0.01	0.37 ***	0.01	0.37 ***	0.01
Bullying reciprocity	4.89 ***	0.14	4.92 ***	0.14	4.87 ***	0.14	4.87 ***	0.14
Bullying cyclicity	0.13 **	0.05	0.13 **	0.05	0.13 **	0.05	0.13 **	0.05
Bullying transitivity	0.12 ^	0.07	0.13 ^	0.07	0.11	0.07	0.11	0.07
Bullying intransitivity	-0.08	0.06	-0.07	0.06	-0.09	0.06	-0.09	0.06
Number of shared activities	0.01	0.03	0.00	0.03	0.00	0.03	0.00	0.03
Live in same neighborhood	0.24 **	0.08	0.26 **	0.08	0.25 ***	0.08	0.25 *	0.08
Male→Female	-0.19 **	0.06	-0.19 **	0.06	-0.20 ***	0.06	-0.20 ***	0.06
Female→Male	-0.56 ***	0.07	-0.57 ***	0.07	-0.59 ***	0.07	-0.59 ***	0.07
Female→Female	0.14 *	0.06	0.12 *	0.06	0.08	0.06	0.09	0.06
White→Black	-0.96 ***	0.11	—	—	—	—	—	—
White→Other	-0.55 ***	0.11	—	—	—	—	—	—
Black→Black	-0.64 ***	0.08	—	—	—	—	—	—
Black→White	0.00	0.06	—	—	—	—	—	—
Black→Other	-0.42 ***	0.12	—	—	—	—	—	—
Other→White	-0.35 **	0.11	—	—	—	—	—	—
Other→Black	-0.32 *	0.13	—	—	—	—	—	—
Other→Other	-0.01	0.15	—	—	—	—	—	—
Same race	—	—	0.56 ***	0.05	0.52 ***	0.05	0.33	0.26
School diversity	—	—	—	—	2.11 ***	0.27	1.87 ***	0.43
Same race*diversity	—	—	—	—	—	—	0.39	0.54
-2 Log Likelihood	21972.80		22025.5		21967.2		21966.6	
N=761,558 dyads								

^p<.05, one-tail test; *p<.05; **p<.01; ***p<.001

127

In terms of gender, we find strong support for hypothesis 4, as bullying tends to occur within, rather than between, sexes. Boys are 20 percent more likely to bully boys than they are to bully girls; boys are also 1.75 times more likely to be bullied by boys than by girls. Girls are also significantly more likely to pick on other girls than boys. There are two interesting asymmetries, however. First, girls are 15 percent more likely to bully each other than boys are to bully each other. Second, rotating the reference category (not shown) revealed that boys are significantly more likely to bully girls than girls are to bully boys. Taken together, these findings suggest that while boys and girls may have similar perpetration rates (models of bullying outdegree do not find any gender differences), girls are significantly more likely to be victimized, mostly by girls, but also by boys.

Model 1 finds strong support for hypothesis 1: dyads with students of different races were less likely to involve bullying. Compared to White→White pairs, mixed-race dyads were between 38 and 72 percent as likely to involve bullying. Rotating the reference categories revealed that mixed race pairs were also less likely to involve bullying than the other same-race dyads, that there were no significant differences among the three types of same-race dyads. Because of this, model 2 drops the specific race indicators in favor of one binary indicator of whether the pair was of the same race, finding that same-race pairs are 1.75 times as likely to involve bullying as mixed race pairs.

Model 3 incorporates school diversity into the models, and finds that it is significantly related to bullying in a positive direction: for every .10 increase in school diversity the likelihood of bullying increases by 21 percent. Model 4 introduces an interaction between

128

same-race and diversity, but finds no significant effect, contrary to hypothesis 2.[46]

Accordingly, I adopt model 3 as a baseline model for further hypothesis testing.

Table 4.3 tests hypotheses related to the friendship network. Model 1 shows that

friends are significantly more likely to bully each other than non-friends, on average.

Compared to non-friends, senders are 2.8 times as likely to bully those they nominate as

friends. When the receiver nominates the sender as a friend, they are 5.1 times as likely to be

bullied by that person. Mutual friendship are 4.5 times more likely to involve bullying.

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[46] I tested hypothesis 2 in a number of ways in addition to what is shown; I estimated models with the interaction of the specific race indicators with diversity; I tested the same-race variable interacted with percent black rather than overall diversity; and I tested the specific race indicators interacted with percent black. The only significant finding in all these tests was that Whites are even less likely to bully Blacks as the percent Black in the school increases, though the significance level was marginal.

Table 4.3: Logistic Regression of Bullying on Friendship Network Characteristics

Variable (Sender → Receiver)	Model 1 β	Model 1 SE	Model 2 β	Model 2 SE	Model 3 β	Model 3 SE
Intercept	-8.86 ***	0.15	-6.91 ***	0.17	-8.76 ***	0.17
Sender bullying outdegree	0.58 ***	0.00	0.70 ***	0.01	0.58 ***	0.01
Sender bullying indegree	-0.07	0.06	-0.10 ^	0.06	-0.10 ^	0.06
Receiver bullying outdegree	0.04	0.06	0.00	0.06	0.02	0.06
Receiver bullying indegree	0.38 ***	0.01	0.39 ***	0.01	0.38 ***	0.01
Bullying reciprocity	4.72 ***	0.14	4.68 ***	0.14	4.82 ***	0.14
Bullying cyclicity	0.09 ^	0.05	0.09 ^	0.05	0.10 *	0.05
Bullying transitivity	0.01	0.07	0.10	0.07	0.04	0.07
Bullying intransitivity	-0.10 ^	0.06	-0.07	0.06	-0.08	0.06
Number of shared activities	0.00	0.03	-0.20	0.03	-0.01	0.03
Live in same neighborhood	0.23 **	0.08	0.26 **	0.08	0.24 **	0.08
Male→Female	-0.12 *	0.06	-0.04	0.06	-0.16 *	0.06
Female→Male	-0.51 ***	0.07	-0.44 ***	0.07	-0.55 ***	0.07
Female→Female	0.10 ^	0.06	0.13 *	0.06	0.06	0.06
Same race	0.47 ***	0.05	0.35 ***	0.05	0.47 ***	0.05
School diversity	2.16 ***	0.27	2.62 ***	0.27	2.12 ***	0.27
Sender nominates receiver as a friend	1.40 ***	0.14	—	—	—	—
Receiver nominates sender as a friend	1.63 ***	0.12	—	—	—	—
Mutual friendship	1.49 ***	0.16	—	—	—	—
Friendship distance	—	—	-0.79 ***	0.04	—	—
Friendship distance squared	—	—	0.06 ***	0.00	—	—
Friendship transitivity	—	—	—	—	0.16 ***	0.03
Friendship intransitivity	—	—	—	—	-0.01	0.01
Friendship cyclicity	—	—	—	—	0.16 ***	0.02
-2 Log Likelihood	21718.0		21512.1		21756.3	
N=761,558 dyads						

^p<.05, one-tail test; *p<.05; **p<.01; ***p<.001

Model 2 tests hypotheses about friendship distance,[47] and finds evidence of a curvilinear effect. Using a base case with the means or modes on all variables, figure 4 displays the predicted effect of social distance on the bullying rate. We do not find the hypothesized inverted J-relationship to bullying, but rather, a U-shaped curve where adolescents are likely to bully those with whom they are either socially close or very distant.[48] Most importantly, we do find that the likelihood of bullying generally declines with social distance.

Figure 4: Predicted Dyadic Bullying Rate, By Social Distance

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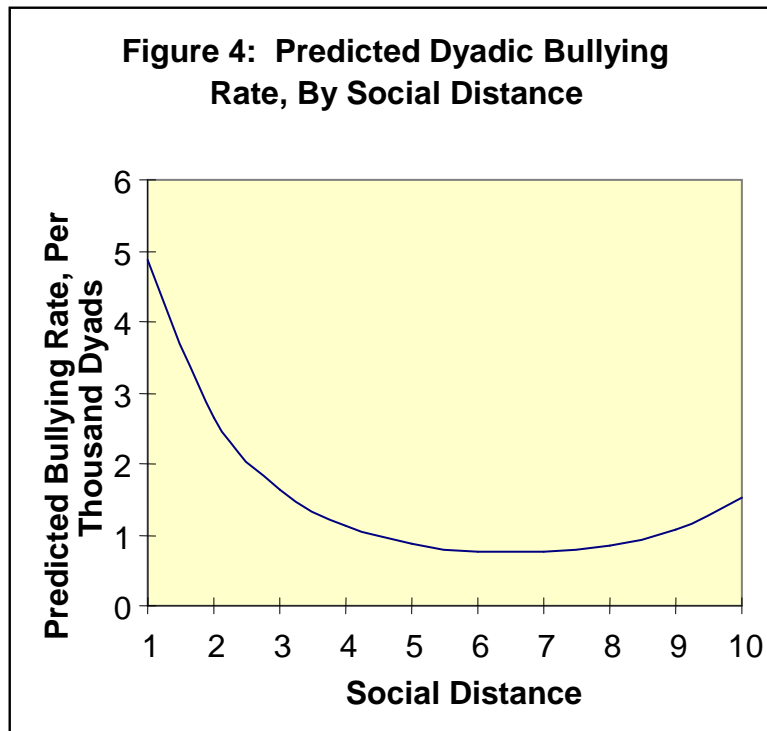
[47] Again, friendship distance is calculated in a symmetrized network, such that a tie is counted from A to B if either A nominates B or B nominates A as a friend. While there are differences in the effects of friendship type (sender→receiver, receiver→sender, and reciprocal), all three types are significantly more likely to involve bullying than non-friends so it is justifiable to collapse them all into a social distance of 1 for the purposes of hypothesis testing.

[48] Disconnected dyads technically have infinite social distance, but here I assign them a value of 10, which is one greater than the largest observed social distance. However, I also ran models: a) where disconnected dyads had social distance imputed based on their structural characteristics; and b) where I included a binary indicator of whether the dyad was connected. Results were identical, implying that the upturn is not do to the arbitrary assignment of disconnected dyads.

Model 3 shows the results from the structure of the friendship network. As hypothesized, we find that friendship transitivity and cyclicity are positively related to bullying. Intransitivity is included as a control, as these are complex and interdependent variables: a tie that creates a transitive triad might also create a cycle. However, friendship intransitivity is not significant. I tested these three variables separately but there were no differences in their effects. In addition, I tested whether the effects changed when interacted with a friendship tie, but again there were no differences.

Table 4.4 tests hypotheses about the role that popularity differences play. Model 1 shows that the friend gap—defined as sender's friendship indegree minus receiver's friendship indegree—is positively related to bullying. Compared to a pair with the same friendship indegree, a sender with 10 more friends than the receiver is 13 percent more likely to bully that receiver. Model 2 tests the effect of friendship *difference*, defined as the absolute value of the difference in the sender and receiver's friendship indegree, but finds no significant effect. Model 3 combines the two effects, and finds that the effect of the friendship gap becomes stronger, but the effect of friendship difference is still insignificant.

Table 4.4: Logistic Regression of Bullying on Popularity Differences

Variable (Sender → Receiver)	Model 1 β	SE	Model 2 β	SE	Model 3 β	SE	Model 4 β	SE	Model 5 β	SE	Model 6 β	SE
Intercept	-8.74 ***	0.15	-8.71 ***	0.16	-8.69 ***	0.16	-8.74 ***	0.16	-8.72 ***	0.16	-8.72 ***	0.16
Sender bullying outdegree	0.58 ***	0.01	0.58 ***	0.01	0.58 ***	0.01	0.58 ***	0.01	0.58 ***	0.01	0.58 ***	0.01
Sender bullying indegree	-0.09	0.06	-0.09 ^	0.06	-0.09 ^	0.06	-0.09	0.06	-0.09	0.06	-0.09	0.06
Receiver bullying outdegree	0.03	0.06	0.03	0.06	0.03	0.06	0.03	0.06	0.03	0.06	0.03	0.06
Receiver bullying indegree	0.37 ***	0.01	0.37 ***	0.01	0.37 ***	0.01	0.37 ***	0.01	0.37 ***	0.01	0.37 ***	0.01
Bullying reciprocity	4.87 ***	0.14	4.87 ***	0.14	4.87 ***	0.14	4.87 ***	0.14	4.86 ***	0.14	4.86 ***	0.14
Bullying cyclicity	0.13 **	0.05	0.13 **	0.05	0.13 **	0.05	0.13 **	0.05	0.13 **	0.05	0.13 **	0.05
Bullying transitivity	0.11	0.07	0.11	0.06	0.11	0.06	0.11	0.06	0.11	0.06	0.11	0.06
Bullying intransitivity	-0.09	0.06	-0.09	0.06	-0.09	0.06	-0.09	0.06	-0.09	0.06	-0.09	0.06
Number of shared activities	0.00	0.03	0.00	0.03	0.01	0.03	0.01	0.03	0.01	0.03	0.01	0.03
Live in same neighborhood	0.25 **	0.08	0.25 **	0.08	0.25 **	0.08	0.25 **	0.08	0.25 **	0.08	0.25 **	0.08
Male→Female	-0.19 **	0.06	-0.20 **	0.06	-0.19 **	0.06	-0.20 **	0.06	-0.20 ***	0.06	-0.20 ***	0.06
Female→Male	-0.59 ***	0.07	-0.58 ***	0.07	-0.59 ***	0.07	-0.58 ***	0.07	-0.58 ***	0.07	-0.58 ***	0.07
Female→Female	0.09	0.06	0.09	0.06	0.09	0.06	0.09	0.06	0.08	0.06	0.08	0.06
Same race	0.52 ***	0.05	0.52 ***	0.05	0.52 ***	0.05	0.52 ***	0.05	0.52 ***	0.05	0.52 ***	0.05
School diversity	2.80 ***	0.28	2.08 ***	0.27	2.06 ***	0.28	2.09 ***	0.28	2.10 ***	0.28	2.10 ***	0.28
Friend gap (sender - receiver)	0.01 ^	0.01	—	—	0.01 *	0.01	—	—	—	—	—	—
Friend difference (abs. value)	—	—	-0.01	0.01	-0.01	0.01	—	—	—	—	—	—
Popularity gap (sender-receiver)	—	—	—	—	—	—	0.00	0.00	—	—	0.00	0.00
Popularity difference (abs. value)	—	—	—	—	—	—	—	—	-0.01 *	0.00	-0.01 *	0.00
Popularity difference squared	—	—	—	—	—	—	—	—	0.0001 *	0.00	0.0001 *	0.00
-2 Log Likelihood	21963.8		21965.8		21961.4		21967.2		21963.2		21962.8	

N=761,558 dyads

^p<.05, one-tail test; *p<.05; **p<.01; ***p<.001

Figure 5: Predicted Bullying Rate, By Popularity Difference
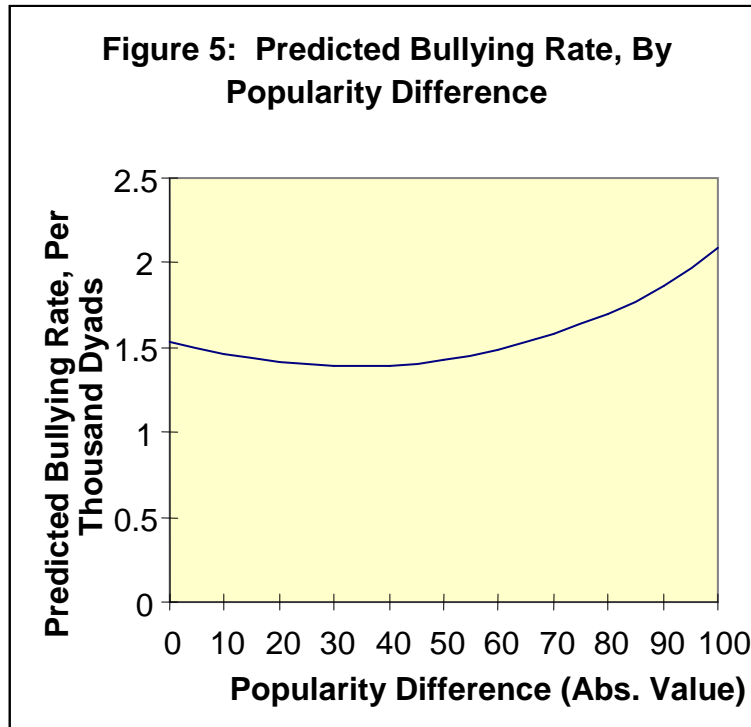
Interestingly, when we define popularity in a broader sense using percentile of betweeness centrality, we find no significant effect of popularity gap (model 4), suggesting that students are as likely to bully *more* popular students as less popular ones. In model 5, however, we find that the absolute value of popularity difference has a nonlinear relationship to bullying, shown in Figure 2.[49] It appears that there is a tendency to bully those who are either very similar or very different in terms of popularity. However, the vast majority of dyads are within 40 percentile points of one another, so for most of the sample, the tendency is to bully those of similar popularity. This effect is unchanged when popularity gap is included in the model (Model 6).

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[49] I tested quadratic terms for all of the friendship and popularity measures, but only popularity difference had a significant squared term.

Table 4.5 tests the final hypotheses, that senders are more likely to pick on those who are less developed and less attractive than they are. A one-standard deviation increase in the appearance gap (a value of 1.12) corresponds to a 14 percent increase in the likelihood that the sender will bully the receiver. The effect for puberty is weaker: an increase in the pubertal gap of one standard deviation (a value of .44) results in a 5 percent increase in the likelihood of bullying.

Table 4.5: Logistic Regression of Bullying on Appearance and Development

Variable (Sender → Receiver)	Model 1		Model 2	
	β	SE	β	SE
Intercept	-8.79 ***	0.15	-8.75 ***	0.15
Sender bullying outdegree	0.58 ***	0.01	0.58 ***	0.01
Sender bullying indegree	-0.09	0.06	-0.09	0.06
Receiver bullying outdegree	0.02	0.06	0.03	0.06
Receiver bullying indegree	0.38 ***	0.01	0.37 ***	0.01
Bullying reciprocity	4.89 ***	0.14	4.87 ***	0.14
Bullying cyclicity	0.13 **	0.05	0.13 **	0.05
Bullying transitivity	0.11	0.07	0.11	0.07
Bullying intransitivity	-0.09	0.06	-0.09	0.06
Number of shared activities	0.00	0.03	0.00	0.03
Live in same neighborhood	0.26 **	0.08	0.25 **	0.08
Male→Female	-0.22 ***	0.06	-0.20 **	0.06
Female→Male	-0.56 ***	0.07	-0.58 ***	0.07
Female→Female	0.09	0.06	0.09	0.06
Same race	0.52 ***	0.05	0.52 ***	0.05
School diversity	2.13 ***	0.28	2.09 ***	0.27
Appearance gap (sender-receiver)	0.12 ***	0.01	—	—
Puberty gap (sender-receiver)	—	—	0.11 ^	0.06
-2 Log Likelihood	21928.7		21963.1	
N=761,558 dyads				

^p<.05, one-tail test; *p<.05; **p<.01; ***p<.001

Table 4.6 displays results for a model that includes all the significant variables from earlier models. We find that most variables remain significant, and at roughly the same magnitudes. There are exceptions, however. By controlling for all other factors, we find that

boys do not bully girls significantly less often than they bully each other. Additionally, the effect sizes of the friendship indicators are dramatically reduced, and there is now no significant difference between non-friends and dyads where the sender nominates the receiver as a friend. When the receiver nominates the sender as a friend, she is more likely to be bullied, regardless of whether the friendship is mutual. However, this model also includes social distance, which is directly related to friendship, and a combined model that leaves out social distance (not shown) finds no substantive difference for friendship compared to what is shown in table 4.3.

Including social distance, which is unchanged, also likely erodes the effect of friendship transitivity to insignificance, though friendship cyclicity remains significant. Finally, the effect of the friendship gap becomes insignificant. All other findings are substantively the same as those presented earlier. It is especially important that bullying continues to be more likely to occur within race, even after controlling for propinquity and social distance. In fact, separate analysis (not shown) finds that interracial friendship is just half as likely as interracial bullying.

Table 4.6: Combined Logistic Regression of Bullying on Dyadic Characteristics

Variable (Sender → Receiver)	β		SE
Intercept	-7.09	***	0.21
Sender bullying outdegree	0.57	***	0.01
Sender bullying indegree	-0.08		0.06
Receiver bullying outdegree	0.01		0.06
Receiver bullying indegree	0.39	***	0.01
Bullying reciprocity	4.68	***	0.14
Bullying cyclicity	0.10	*	0.05
Bullying transitivity	-0.01		0.07
Bullying intransitivity	-0.08		0.06
Number of shared activities	-0.01		0.03
Live in same neighborhood	0.27	**	0.08
Male→Female	-0.06		0.06
Female→Male	-0.42	***	0.07
Female→Female	0.12	*	0.06
Same race	0.36	***	0.05
School diversity	2.63	***	0.28
Sender nominates receiver as a friend	-0.12		0.16
Receiver nominates sender as a friend	0.36	**	0.14
Mutual friendship	0.29	^	0.17
Friendship distance	-0.71	***	0.06
Friendship distance squared	0.05	***	0.00
Friendship transitivity	-0.02		0.03
Friendship cyclicity	0.04	^	0.02
Friend gap (sender - receiver)	0.00		0.01
Popularity difference (abs. value)	-0.01	**	0.00
Popularity difference squared	0.0001	**	0.00
Puberty gap (sender-receiver)	0.13	*	0.06
Appearance gap (sender-receiver)	0.12	***	0.02
-2 Log Likelihood	21437.6		
N=761,558 dyads			

^p<.05, one-tail test; *p<.05; **p<.01; ***p<.001

Discussion and Conclusions

This paper had three purposes. The first objective was to determine whether bullying is primarily inter- or intra-racial, and whether school racial diversity influenced the prevalence of interracial bullying. We find that bullying is strongly bounded by race, even after controlling for the number of shared extracurricular activities, residential proximity, and the social distance between the pair. As such, there are additional in-group preferences at

work that go beyond the well-known in-group friendship preference. One possibility is that adolescents wish to avoid conflicts that can easily escalate into collective violence, but this is only speculation, and future research should consider this question. In any case, while it rarely crosses racial lines, we nonetheless find that the school's racial diversity increases the prevalence of bullying. However, interracial bullying is no more or less likely in diverse schools than in homogenous ones. That the tendency to avoid bullying students of other races is not influenced by their proportion in the school is unanticipated by theory, and should also be examined in future research.

The second purpose of this analysis was to consider structural factors that may be related to bullying. In that regard, two general approaches to understanding bullying were presented. Bullying, as a negative relationship, could be assumed to be antithetical to friendship, or alternatively, it could be treated as simply another form of social interaction. In the former case, we would expect bullying not to occur between friends, and to be more likely than not to cross gender and racial lines. In the latter, we would expect the reverse. This analysis has powerfully demonstrated that bullying, rather than being antithetical to friendship, is compatible with it. Friendship can involve domination, and when adolescents make friendship claims they open themselves up to the possibility of victimization.

When bullying does stray outside the bounds of friendship, it usually involves peers who are either socially close or very distant. Among socially close dyads, there are two situations where bullying is particularly likely. We find that structural rivals, those dyads that form transitive friendship triads, are particularly likely to involve bullying. Additionally,

bullying is likely to flow from structural superiors, those who could create a cyclic friendship triad, to structural subordinates.

Contrary to expectations, bullying is more likely when it creates reciprocal or cyclical victimization. Relatively high reciprocity rates for some types of aggression were also found by Xie et al. (2002). Evidence that bullying is transitive and that it less likely under intransitive circumstances can be found, but is weak. Bullying is therefore more clustered and less hierarchical than expected, and we do not find strong evidence of pecking orders. However, it important to interpret these findings correctly: while bullying is more likely when it would create a cycle or a reciprocal relationship, nearly 80 percent of all bullying relations are not reciprocated, and over 95 percent of bullying dyads do not create any cycles.

The third purpose of this paper was to examine how status affects bullying. Earlier analysis of these data (chapter 2) found that adolescents in the middle of the popularity spectrum are the most likely to bully. Here, we find that adolescents with more friends tend to bully those with less, that more physically developed students pick on their less developed peers, and that attractive kids victimize unattractive ones. So status differences matter, and the strong dominate the weak. But we also found that adolescents tend to pick on those of similar social status, and that this effect was stronger than that of the difference in the number of friends. This suggests that bullying is most likely to occur between kids who are in the middle of the social hierarchy and who are closely connected but of unequal "coolness."

There are several limitations to this analysis. First, it is set in a rural setting. Findings may not generalize to other areas, particularly those with very different racial compositions. Second, this analysis only includes 14 schools, so school-level findings in particular are tentative. It is possible that the racial diversity of the school will have different consequences in other studies. Finally, this analysis is not longitudinal, and causal inferences should be made cautiously.

Despite these qualifications, this analysis raises important issues. That bullying ties are even less likely to cross racial boundaries than friendship ties is, perhaps, a cause for some relief. However, any relief about the relative scarcity of race-based bullying should be tempered by the finding that bullying occurs within friendships. While the idea of friendship as a vehicle for domination is hardly new in sociology, it will likely come as a surprise to bullying prevention experts, and perhaps even to adolescents in those relationships: the *Context* study data collectors were careful not to use the word bullying because it may conjure up stereotypes of lunch money being stolen, when in fact bullying is more likely to come in the guise of Monday morning gossip. While it does not find evidence of classic pecking order hierarchies, this study strongly suggests that bullying, as it tends to occur within the social group, is a means by which adolescents jockey for social standing. It is hoped that this study will spur further research and will direct greater attention toward bullying prevention within friendships and small social groups, and greater emphasis on building healthy relationships.

CHAPTER 5

CONCLUSIONS

Twenty years ago, when he was 15, Jon Ronson was thrown in a lake by some of his

friends. By his own account, the episode has haunted him for the past two decades,

completely coloring his experience of high school in Cardiff, Wales. At his high school

reunion, he asked some of the culprits about it. One of them remembered the episode clearly,

but was convinced that they all jumped in the lake together, in fun. He refused to believe that

it was anything but general carousing, much less an episode of bullying (Ronson, 2006).

Accounts like this one, besides reminding us of the longevity of bullying memories, highlight

the difficulty in measuring bullying. Of course, recall can introduce errors, but it is likely

that Jon and his friend would have had differing interpretations of the event had they been

asked about it later that day.

This dissertation has reinforced the importance of collecting information about

bullying from multiple sources. It has shown (chapter 1) that self-reported bullying rates are

lower than those generated from a network-based measure and has suggested that self-

reported techniques may underestimate the true rate of bullying. Survey questions about

victimization, which may be less likely to be underreported, may come closer to the actual

rate of bullying but self-reported victimization cannot be used to study the predictors of

bullying perpetration. Studying bullying from a network approach has the advantage of more

accurate estimates, but it also has the advantage of allowing the researcher to determine who bullies whom, as opposed to simply who bullies in general. It is hoped that future research will continue to measure and analyze bullying using social network analysis.

This dissertation has extended existing knowledge about bullying. Like existing research, it has found that adolescents with conflictive home lives, who are less attached to parents and school, who are depressed, who are themselves bullied, and who have friends who bully are more likely to bully others. It has bolstered research that has found that being bullied is related to depression and suicide, and that bullying others is related to depression and anxiety. However, even with these established findings, this study represents a significant contribution because of its longitudinal design. Most earlier research has been cross sectional, and so causal relationships cannot be discerned. This study has tested these factors using longitudinal data, and has clarified the causal relationships.

This dissertation has also raised a number of new issues with respect to bullying. One key contribution is its emphasis on the role of race. Prior research has paid scant attention to how race is related to bullying. This dissertation has found that minorities are significantly more likely to bully others, and that these racial differences cannot be explained by differences in socioeconomic status, neighborhood disorder, school attachment, parental attachment, depression, status insecurity, pubertal development, the influence of aggressive friends, family conflict, weakened conventional beliefs, or higher rates of victimization. One likely answer to this puzzle in chapter 2 comes from the analysis in chapter 3, which finds that minority adolescents experience larger social status benefits from bullying than do

whites. For the most part, however, bullying involvement appears to have the same consequences for adolescents of all races.

Finally, this dissertation has shown that, even after controlling for shared activities, residential proximity, and social distance, adolescents are still less likely to bully someone of a different race. While racial diversity increases the prevalence of bullying, it appears to have no influence on the likelihood of interracial bullying. These findings may differ for other settings, and future research should continue to explore these relationships.

Many of the new findings in this dissertation support a relatively heterodox perspective on bullying. Rather than a pathological symptom of deviance, bullying is a normal part of adolescent social life. It is normal for teenagers partly because status insecurity is normal for teenagers: adolescents are occasionally unsure where they fit in the social hierarchy and often feel pressure to gain or maintain social standing. It is the seemingly normal kids in the middle of social hierarchy, rather than the ones on the extremes, who are mean to others. While personal attractiveness seems to prevent bullying, having attractive friends appears to cause it, as does having friends who place great importance on popularity.

Further evidence of bullying as a way to resolve status insecurity comes from the fact that when adolescents bully others, they are more likely to bully those who are socially close, including friends, and who are of similar popularity. They are particularly likely to bully those who are socially close and structural rivals or subordinates. These findings are supported by research examining how meanness can coexist with friendship, particularly in

relatively popular social cliques (Merten, 1997). Additionally, the notion of status insecurity

as a motivating factor for bullying is strengthened by the fact that bullying others increases

social status.

　　　While this dissertation has placed greater emphasis on the findings showing that

otherwise normal kids bully in order to resolve status insecurities, this emphasis should not

be interpreted as an attempt to replace earlier perspectives on bullying. To the contrary, this

dissertation has also found that adolescents with mean friends, conflictive home lives,

problems with depression, and who are themselves victimized are more likely to bully others.

It has found that physically developed and attractive kids are more likely to bully

unattractive, less-developed ones. It has also found that bullying others increases depression

and anxiety. Therefore, this dissertation does not suggest that all bullying occurs between

seemingly normal kids, or that status insecurity is the only motivation for bullying. *It only

argues that status insecurity should be considered as one of the several motivations for

bullying and that bullying can occur between status equals, close associates, and friends.*

　　　Even so, this dissertation has presented a very different view of bullying than might be

encountered in the literature. In fact, the findings depart from the typical picture of bullying

to such an extent that some may question whether bullying is in fact what this study

measures. Because of this, it is worth reviewing some important findings. First, of all

victims of bullying in this study, 71 percent experienced verbal abuse, 68 percent

experienced indirect bullying, and 46 percent experienced physical attacks. While some

verbal abuse might be dismissed as playful teasing, indirect and physical bullying is never

playful. Furthermore, 60 percent of these victims were bullied weekly. Finally, being victimized is significantly related to social isolation, depression, and suicide attempts.

Implications for Prevention

Bullying is of serious concern for parents and school administrators, and most school districts have adopted anti-bullying policies. Intervention studies have shown mixed results, however. The most successful, the Olweus Bullying Prevention program, has shown reductions in the prevalence of bullying ranging from 40-70 percent (Olweus, 1993). However, many of the successful programs have not been able to maintain long-term success, and when they do, it may be because of the ongoing involvement of the research team in the school (Galloway and Roland, 2004).

Most bullying prevention programs adopt either a rules and consequences approach (e.g., Olweus, 1993), whereby bullies are confronted and disciplined, or a problem-solving approach, which emphasizes collaboration between bullies, victims, and sometimes parents (e.g., Smith et al., 2004). Almost uniformly, however, bullying prevention programs are specific and focus directly on bullying behaviors.

However, Galloway and Roland (2004) argue that such a direct approach may not be as successful as a more holistic effort, which focuses more on school climate in general. They recognize that the crucial stakeholders in any school-based bullying prevention initiative are teachers. Rather than ask that teachers to impinge on their already hectic schedule to implement a bullying intervention, they framed the intervention as a general approach to

improving classroom management and relations among pupils, and trained teachers as part of regularly scheduled professional development requirements (Galloway and Roland, 2004). The intervention exposed teachers to research regarding effective pedagogy, positive relations between pupils, and developing routines for better task-oriented work, and then included teachers in two-hour peer supervised teaching sessions. The results were positive: after two years, they continued to find lower bullying prevalence in the experimental schools (Galloway and Roland, 2004).

Such a holistic approach to bullying prevention might be supported by findings in this dissertation. Bullying that occurs between friends and close associates might be difficult to detect and prevent, as it is unlikely to be recognized as bullying. Prevention is also particularly difficult when there it bring the rewards of social status. Some revisions are in order, and while specific intervention recommendations are beyond the scope of this dissertation, it is possible to outline three principles that may make future prevention efforts more successful.

The first principle is awareness of bullying in all its forms. Adolescents may know that their friends are sometimes mean to them, but they may not consider it bullying. Simply giving a name to the kinds of abuse that can occur within a friendship may be empowering, and in any case, is the first step toward prevention.

The second principle is that the majority rules. In virtually any school, the majority of students are not involved in bullying. Instead, they form the audience for bullying

performances, as well as the awards committee. They may applaud acts of cruelty and humiliation, and they reward the entertainers with increased social status. If a bullying prevention program is to be successful over the long term, it must redefine the acceptability of bullying in the eyes of its intended audience.

Finally, social hierarchies are bad. Status insecurity comes from status hierarchies. The more vertically oriented schools are and the more social inequality there is, the more status insecurity there will be. A successful bullying prevention program will flatten social hierarchies.

Of course, these are theoretical principles, and changing what is cool is easier said than done. But it is worth considering the experience of Vivian Gussin Paley (1993), who enacted a very simple rule in her kindergarten class: you can't say "you can't play." This simple rule, which forbade exclusivity in play, had dramatic consequences for her pupils. At first, there was strong resistance. One said:

> Some people—even me—want to own things. They say you can't come here and you can't come there. They say they are the boss, and other people agree. Even me. If that stopped, then your plan could work. (Paley, 1993).

Ultimately, however, the rule worked, and made everyone happier, even those popular "bosses" who had resisted it at first. In the end, everyone suffers from bullying, even the bullies who gain status from their behavior. I close with one last account of a bullying episode:

Jonathan Gold was a self-described nerd in high school, and played the cello. There was a boy in his high school who often picked on him and others. Jonathan describes him now as "a gladhander" and quite popular. He also recalled that the boy had achieved some notoriety by setting a school leg-press record of 510 pounds. One day as Jonathan was walking down the hall with his cello, the boy hip-checked Jonathan, who fell down the stairs, causing significant damage to his cello. He remembers looking back up the stairs and seeing the boy laughing and "high-fiving" his friends.

The boy's name? Jack Abramoff.

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149

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