Perceptions of Collective Efficacy and Bullying Perpetration in Schools

Kirk R. Williams, University of California, Riverside
Nancy G. Guerra, University of California, Riverside

Bullying is a specific type of aggression defined by repeated and unprovoked attacks by a more powerful aggressor against a less powerful victim (Olweus 1993; Rigby 2002). Bullying can be direct and visible, such as physical assaults or verbal attacks. It can also be indirect and secretive, such as spreading rumors, and more recently, using electronic media to cause harm and humiliation (Williams and Guerra 2007). Because such behavior can only occur in the context of ongoing social interactions, it has been studied almost exclusively within specific social settings, including workplaces, prisons, and schools. An emergent literature examines the prevalence and correlates of bullying in these and other settings, but the bulk of recent research on bullying has analyzed children’s behavior in schools (or electronically as an extension of school-based relationships). As children negotiate peer status hierarchies and group affiliations with classmates, bullying has emerged as a prevalent and problematic aspect of development and a significant social problem in the United States and internationally (Kanetsuna and Smith 2002; Nansel et al. 2001; Nation et al. 2008).

Given that bullying in schools is embedded in the fabric of social interaction, it cannot be understood fully without careful consideration of the social dynamics that foster and sustain it. Yet, most studies of children’s bullying focus primarily on individual characteristics and personal pathology of bullies and victims rather than contextual features of schools that facilitate bullying behavior. For example, when compared to controls (nonbullies), bullies have been
found to be more hostile and impulsive (Espelage, Bosworth, and Simon 2001), more narcissistic (Salmivalli, Kaitanen, and Lagerspetz 1999), and less empathic (Menesini et al. 2003), but often more socially skilled (Nation et al. 2008). Accounts of characteristics that differentiate types of victims also have been provided (e.g., Tobin et al. 2005). This scholarly approach has considerable merit but is limited in scope, especially given the social nature of bullying behaviors. An emphasis on these “personalized” accounts of bully and victim characteristics offers little to further an understanding of the social dynamics involved with bullying.

An examination of the social processes that contribute to bullying in schools requires careful consideration of potential contextual influences at the school level. However, most studies that have examined school context, bullying, and related behaviors such as aggression have been grounded in education and psychology and have not provided an integrated theoretical framework for understanding these social contextual influences. Much of the research on school context has centered on the impact of school climate on behavior in schools (Bryk and Schneider 2002). Unfortunately, school climate is a vague and imprecise concept often defined as the “quality and character of school life” that touches practically every aspect of the social atmosphere of schools (Cohen 2006; Moos 1979). Further, much of the research on the effects of different aspects of school climate on student problems has emphasized how climate impacts individual behavioral outcomes such as aggression rather than student participation in socially embedded behaviors such as bullying.

When studies have examined more specific aspects of school climate and their relation to student aggressive behaviors (which are related, but still distinct from bullying), they typically partition climate into four domains: academic support; student discipline; social support from teachers; and social support from peers (Roeser and Eccles 1998). Academic support is defined as an environment with high academic expectations that encourages learning. Student discipline refers to clear and consistent rules that are fairly administered. Social support is defined as teachers and/or peers who are responsive and care about students. Several empirical studies have linked these dimensions with student behavior problems—in other words, individual behavior problems are more likely when students perceive low academic expectations, unfair or irregular discipline, and low levels of teacher and student support (Kuperminc et al. 1997; Wang et al. 2010).

The limited number of studies that specifically have examined the influence of school climate on bullying have largely focused on general school climate. Again, measures of general school climate allow for characterization of schools along a broad positive or negative dimension and include questions such as “I am happy to be at this school” (Furlong et al. 2005). A slightly different perspective on school contextual effects on bullying has addressed how bullies fit into the peer context at school, specifically whether they are more likely to be rejected or disliked by peers or socialize with other bullies (Vaillancourt, Hymel, and McDougall 2007). In recent meta-analyses that included studies examining these school contextual predictors of bullying, affiliation with deviant peer groups was the most significant predictor of bullying, followed by being disliked by peers and perceived negative school climate, which had significant but very modest effect sizes (Cook et al. 2010).

Although each of the dimensions of school context addressed in studies of behavior problems and bullying may be important, there is still little in the way of a coherent theoretical framework for linking school context with student engagement in negative behaviors. This is relevant for problem behaviors such as individual aggression targeting another student as well as for bullying behaviors that are more deeply connected to the social dynamics of schools. An important next step is to test a carefully articulated theoretical model that can specify more clearly the precise mechanisms of influence of school context on student conduct including bullying. In this regard, the significance of the social dynamics of bullying make it ideally suited for sociological investigation. However, the field of sociology has been slow to offer a viable explanation for bullying in schools or elsewhere. Only recently, Randall Collins (2008) proposed a micro-sociological theory of violence and applied it to bullying, drawing from his...
seminal work on interaction ritual chains (Collins 2004). Yet, no sociological theory has been posited to account for variations in the frequency of bullying across social space and time.

The present study examines bullying in schools through a sociological lens, drawing from neighborhood studies of crime and violence utilizing the theoretical construct of collective efficacy. Collective efficacy has been conceptualized as the linkage between mutual trust and social cohesion among members of a neighborhood (or collectivity) and their willingness to intervene for the common good—a dimension of communities that has been associated with lower rates of crime and violence (Sampson, Raudenbush, and Earls 1997:919). This construct also is well suited for conceptualizing and measuring contextual dimensions of schools, which are strategic for building a sociological understanding of bullying. Collective efficacy also specifies more clearly the precise mechanisms of influence accounting for relations between contextual characteristics and bullying. Further, not only does collective efficacy provide a theoretical foundation for understanding the dynamics of bullying in school settings, but schools provide an ideal setting for testing collective efficacy theory since they are bounded social contexts with regular and ongoing social interactions.

Guided by this argument, lagged cross-sectional (LCS) models and fall-to-spring change (FSC) models of perceptions of collective efficacy and bullying perpetration are specified. The models are estimated to determine whether these theoretically relevant dimensions of school context significantly predict such behavior across two points in time. Additional analyses are conducted to determine whether different dimensions of perceived collective efficacy are more strongly related to changes in the frequency of this form of behavior.

The Theoretical Construct of Collective Efficacy

Collective efficacy has garnered considerable currency in the social sciences. It was developed in neighborhood-level studies of the structural and demographic determinants of crime, with those studies typically cast in the social disorganization tradition of theorizing about such behavior. As discussed below, collective efficacy is relevant to a variety of topics in social science research and has much promise for understanding bullying in schools.

The Meaning and Dimensions of Collective Efficacy

Collective efficacy consists of two central components. The first bears on the nature of social relationships. The issue, however, is not exclusively the interconnections among people, constituting a social network, but the shared trust and support extended to each other, with the recognition that collective action to achieve group interests is mutually beneficial now and in the future. The social network itself forms the structural fabric of the collectivity, but through this structural fabric flows a shared sense of trust and support.

This component of collective efficacy pushes scholarly thinking beyond the notion of social capital. Apart from the issue of dense or weak ties (e.g., Burt 2007; Granovetter 1973), social capital typically denotes connections to or within social networks and the rewards that accrue as a result of these connections, be they to individuals or collectivities (e.g., Bourdieu 1985; Coleman 1988; Field 2003; Portes 1998; Putnam 2000). Collective efficacy rests on the assumption that social networks are a necessary starting point, but it adds the action-oriented component of mutual trust and support as a required precursor for collective mobilization for the common good. To this extent, collective efficacy has an agentic quality missing from conventional thinking about social capital (e.g., Sampson 2006; Sampson, Morenoff, and Earls 1999).

This action-oriented quality is particularly pronounced in the second component of collective efficacy, informal social control. The informal nature of social control undoubtedly refers to community members assuming the responsibility of protecting or promoting the common good rather than formal control agents, such as police or officials of other institutionalized forms of
Collective Efficacy and Bullying

129

maintaining the social order. Although Robert Sampson and associates never provide a precise definition of social control, a concept about which treatises have been written (e.g., Gibbs 1989, 1994), the discussion of this concept suggests it pertains to the willingness of adult community members to intervene in a range of problem situations, with the shared expectation that such intervention will benefit children and adults alike (e.g., Sampson et al. 1997:918). Typically this has been measured as residents’ perceptions of the willingness of others to intervene for the common good, although this is different from actually intervening. As such, the concept bears more on the propensity for informal social control rather than tangible social control mobilized by community members. Research on this distinction suggests that the relation is far from nonproblematic (e.g., Wells et al. 2006).

Taken together, these two components of collective efficacy represent analytical properties of collectivities varying in their mutual support and collective action orientation (e.g., Sampson 2006:152). That variability is not necessarily associated with closeness in the relationships among people in a collectivity (e.g., family connections or friendship networks). The realization of collective efficacy merely requires a reasonable expectation that contact among those people will continue in the future, and thus, they should work together to ensure repeated interactions are mutually beneficial. As Sampson (2006) stated the matter, “while community efficacy may depend on working trust and social interaction, it does not require that my neighbor or local police officer be my friend” (p. 153).

Furthermore, collectivities are not necessarily efficacious with regard to all issues that surface day-to-day (Sampson 2006; Sampson et al. 1997). Some issues may be more salient to people in a collectivity, instigating collective planning and action. Some collectivities may have greater resources or other capacities for addressing particular issues, regardless of their salience (Sampson et al. 1999). The point is that collective efforts are likely to rally around issues for which considerable consensus exists, and those efforts are more likely to be successful. Sampson’s research has focused on the well-being of children, especially violence in public places involving children and adolescents, which is a unifying theme for most residents of any neighborhood. However, the logic of collective efficacy has been extended to other issues as well, including research on obesity in children and adolescence (Cohen et al. 2006), other health-related outcomes (Browning and Cagney 2002), and intimate partner violence (Browning 2002). The present study builds on this burgeoning line of research by examining the relation between collective efficacy and bullying in schools.

Applying Collective Efficacy to Bullying in Schools

Bullying is fundamentally a social behavior, occurring among people involved in relationships characterized by repeated social interactions. Schools provide an appropriate context for studying bullying and collective efficacy because of the regular and ongoing interactions between students and teachers as well as the opportunities for informal social control within both peer culture and student-teacher interactions. Even when bullying occurs electronically, it often stems from and is regulated by social interactions based in relationships at school (Williams and Guerra 2007). It is important to note, however, that when applying collective efficacy to the school context, cohesion and trust and informal social control involve student-student and student-teacher interactions.

Collective efficacy also provides a potential explanation for the influence of social relationships and informal social control on children’s behavior in school beyond the vague and more global notion of school climate. Although school climate research often includes dimensions of school context such as perceptions that students and teachers are caring and responsible, it does not rely specifically on perceptions that they can be trusted. Further, both general school climate and the specific dimensions that have been studied previously do not incorporate perceptions of others’ willingness to take action for the common good. Unlike other conceptualizations and measurements of school climate, these two components are distinctive school
characteristics bearing directly on bonds between teachers and students to each other and the larger social context as well as the action-oriented predisposition of teachers and students to support each other in dealing with a specific social problem—bullying. Characterizing the nature of these interactions in terms of the components of collective efficacy appears to be a promising avenue for building a sociological explanation of this social problem. Stated as an empirical question, is bullying less likely in schools where student-student and student-teacher relationships are imbued with cohesion and trust, along with a willingness of students and teachers to intervene towards the common good? Those relationships may not entirely prevent bullying, but they may significantly limit its frequency. The present study is designed to test this asserted relation between collective efficacy and bullying in schools.

Methods

The data analyzed for the present research were drawn from a larger study evaluating a statewide bullying prevention initiative in Colorado, funded by The Colorado Trust, a private grant-making foundation in Denver. The participating grantees included school districts, individual schools, or community-based agencies distributed across 40 of Colorado’s 64 counties, including rural and urban areas of the state.

Schools and Youth Participants in the Present Analysis

The analysis was based on data collected in the fall and spring of the 2006–2007 and 2007–2008 academic years. The design involved drawing new samples of students each year from the fifth, eighth, and eleventh grades, representing transition years in elementary, middle, and high schools. The design allowed analysis of single-year, fall to spring changes among student participants within each year; although between each year, the samples of students in these grades were different. A total of 3,798 youth were eligible for the fall data collection in 2006 and 3,501 were eligible in the fall of 2007. These students represented all students in the fifth, eighth, and eleventh grades in 2006 and 2007. The sample consisted of 60 percent non-Latino whites, with the ethnic minorities being 23.5 percent Latino, 3.7 percent African American, 1.8 percent Native American, 3.0 percent Asian and Pacific Islanders, and 8.0 percent other. Males constituted 47.8 percent of the sample (females 52.2 percent), and the age breakdown was 32.5 percent 10 to 12, 49.3 percent 13 to 15, and 18.2 percent 16 years of age or older.

Procedures

All data collection was conducted in compliance with the protocol approved by the human subjects review board, including acquiring informed parental consent and youth assent (minors can only agree to participate; parents must give consent). Moreover, all instruments developed to collect data from youth were piloted prior to full implementation, with all indices in that pilot study having acceptable reliabilities (i.e., alpha coefficients beyond .70).

Data were collected using two different electronic methods, with the choice of methods negotiated with schools in terms of what was deemed best for their students, although paper questionnaires were used in year one and year two by a small percentage of youth absent the day of data collection (4.5 percent and .3 percent, respectively). Data collectors used an LCD projector to present questionnaire items in classrooms of approximately 30 students or fewer (used by 35.8 percent in 2006–2007 and 17.6 percent in 2007–2008). After the data collectors read each question aloud, students used a wireless response pad to enter their answers, which were automatically recorded in an electronic database and linked to the student identification code. The questionnaire was administered in English or Spanish as needed. The second method of electronic data collection involved adapting the questionnaire to a Web-based format linked to the database, with the questionnaire completed on line (64.2 percent in 2006–2007 and 82.1 percent
Collective Efficacy and Bullying

in 2007–2008). The student Web-based questionnaire was administered in school computer labs. Data collectors assisted students in logging on to the password-protected questionnaire and were available for help as they answered questions at their own pace.

Since most of the data collection was done online, Spanish-speaking students were presented the Spanish version of the questionnaire, with Spanish-speaking assistants available to answer questions. For the in-class data collection, teachers and data collectors negotiated on a case-by-case basis about whether Latino students had enough command of English to participate in class or whether separate administration of the questionnaire was needed. No evidence was found that these different data collection procedures influenced the results reported in this analysis.

**Measures**

Testing for the internal consistency (alpha coefficients) and the dimensionality (factor analyses) of the perceived collective efficacy and self-reported bullying indices were conducted with both academic year samples combined. The rationale for combining the two samples is discussed in the analysis plan below. Means and standard deviations of the fall and spring measures of these variables are presented in the appendix.

**Bullying Perpetration.** Nine items bearing on the perpetration (not victimization) of bullying and bystander involvement were adapted from Dorothy Espelage, Melissa Holt, and Rachel Henkel (2003). For all items, bullying as a distinct form of aggression was highlighted by emphasizing that the behavior was repeated and that the target of the behavior was specifically “identified” and weaker than the perpetrator, implying a power imbalance. An example of a physical perpetration item was “I pushed, shoved, tripped, or picked fights with students I know are weaker than me.” Examples of verbal perpetration items were “I teased or said mean things to certain students” and “I told lies or made fun of certain students using the Internet (e-mail, instant messaging, cell phone text messaging, or Websites).” Examples of negative bystander behaviors were “I encouraged students to push, shove, or trip weaker students” and “I joined in when students were teasing and being mean to certain students.” In the fall, student respondents were asked to “mark how often these things have happened in the past year,” and in the spring, they were asked to “mark how often these things happened since the school year began.” Numeric coding (in parentheses) and response options included (1) never, (2) one or two times, (3) several times, and (4) a lot.

Summary measures were calculated by summing the responses to the respective items for bullying and dividing by the number of items, yielding a mean score for each respondent. This measure could be subdivided into perpetration and bystander involvement, but the nine items were combined into a single index for two reasons. First, a reliability analysis showed they had high internal consistency (fall alpha = .86 and spring alpha = .87). Second, a principal components factor analysis showed that the nine items loaded on a single factor in both years (with factor loadings ranging from .590 to .760 with fall data and .618 to .792 with spring data). The singularity of these two possible components of the measure is most likely due to the use of negative bystander behavior items alone, instead of other types of more positive bystander behavior (e.g., intervening to stop bullying).

**Collective Efficacy.** This key theoretical construct was measured through a modified version of the scale created by Sampson and colleagues (1997). The measure used here included both dimensions of collective efficacy reported previously: cohesion and trust as well as informal social control. The first dimension included seven items: students in my school can be trusted, students in my school generally get along with each other, students in my school generally feel the same way about things, teachers in my school can be trusted, teachers in my school usually get along with students, teachers in my school generally feel the same way
about things, and this is a pretty close-knit school where everyone looks out for each other. Student responses were assessed using a four-point Likert scale ranging from “really disagree” to “really agree.”

Informal social control was operationalized in terms of student perceptions of the willingness of students and teachers to intervene in bullying situations. Respondents were asked to think about what most students and teachers in their school would do in four different situations. The series of four situations was asked about students and then about teachers, yielding eight items for the informal social control index. Specifically, they were asked: “students (teachers) in your school would help out to stop bullying if a student is making fun of and teasing another student who is obviously weaker, a student is spreading rumors and lies about another student behind their back, a student is telling lies or making fun of another student who gets picked on a lot using the Internet (e-mail, instant messaging, cell phone text messaging, or Websites), and a student or group of students is pushing, shoving, or trying to pick a fight with a weaker student. Scoring categories ranged from “never” to “always.”

Similar to the measurement of bullying, items were summed and divided by the total number of items to yield a mean score for each respondent. The fifteen-item collective efficacy index had acceptable levels of internal consistency (fall alpha = .82 and spring alpha = .85). However, a principal components factor analysis showed that the collective efficacy items were multidimensional, forming three factors. Table 1 presents the results of this analysis. Observe that the teacher-based informal social control items loaded most highly on the first factor, with the student-based items loading most highly on the second factor. The third factor consisted of the cohesion and trust items. Given the multidimensional nature of this measure of collective efficacy, specified models (see below) were estimated with each dimension included separately and then all dimensions included together. The objective was to determine which of the dimensions was most strongly related to self-reported bullying.

**Analysis Plan**

Four issues needed to be addressed in formulating the analysis plan. First, overall case loss from missing data (both years combined) was about 42 percent. It was slightly higher in the second year (43.3 percent) compared to the first year (39.7 percent). Of the overall cases lost, 17.8 percent was due to nonresponse in the fall data collection and 23.6 percent was due to attrition from fall to spring data collection. The missing data problem was addressed in two ways. First, multiple imputation with ten iterations was conducted to compensate for missing data (Allison 2002; McKnight et al. 2007). The imputation process involved filling in missing values by drawing from a conditional distribution of missing values, given complete data on other variables. This was done multiple times (ten times in the present analysis), generating multiple data sets with slightly different imputed values for missing data. Each data set was analyzed, and the results were pooled across data sets for the final results, correcting standard errors for underestimation. Since all analyses were done in Stata/SE 10.1, imputation with chained equations was performed using the “ice” command (see Carlin, Galati, and Royston 2008; Royston 2004 for descriptions). Those multiply imputed data were used to estimate the effects of perceived collective efficacy on bullying, using the “micombine” command in Stata/SE 10.1. Hence, the total sample of 7,299 youth in 78 schools and community centers was available for those analyses. Second, the effects of perceived collective efficacy were also estimated with data having complete information, disregarding missing values (i.e., the raw data). Those analyses reduced the sample size to 4,231; however, they permitted a comparison of the results with or without compensating for missing data.

Second, data collection in the fall and spring of both academic years permitted the specification of two different analytical models. The initial analysis estimated LCS models in which the spring measurement of bullying perpetration was regressed on the fall measurement of perceived collective efficacy (or its components). The LCS models allowed the appropriate
specification of the temporal order in the relation between these variables, with the measurement of perceived collective efficacy preceding the measurement of self-reported bullying perpetration during the academic year. Estimation of the LCS model, therefore, addressed the following empirical question: Did individuals perceiving high levels of collective efficacy in the fall report less bullying in the spring? Subsequent analysis estimated a FSC model that involved individual changes in self-reported bullying from the fall to the spring being associated with individual changes in perceptions of collective efficacy during this same time period. This model constituted a replication of the findings produced by estimating the LCS model, with the following empirical question addressed: Did individuals whose perceptions of collective efficacy increased during the academic year report reductions in bullying over this time period? Apart from...
from providing a replication of the LCS analysis, a more general contribution of FSC model estimation is that previous studies of collective efficacy have been limited to more static, cross-sectional analyses. Hence, the present study extends this literature in a novel direction.

Individual change was measured at the individual student level. Change in student reported bullying was estimated by specifying the measure of bullying obtained in the fall as a predictor of the measure obtained in the spring within the FSC models. Doing so held constant the stability in self-reported bullying, with the residuals representing behavioral changes from fall-to-spring. The frequency of bullying measured in the fall was not included in the LCS equations precisely because the central issue of the LCS analyses was to determine whether students perceiving high levels of collective efficacy in the fall report a lower frequency of bullying in the spring. Including the fall measure of bullying in the LCS analysis would preclude addressing this issue directly because perceived levels of collective efficacy or its components measured in the fall would be predicting change in bullying from the fall to the spring—behavioral stability would be controlled with the residuals representing fall-to-spring changes in bullying (see Kessler and Greenberg 1981 for a discussion of such issues).

Consistent with this approach and allowing for a single measure of change in the theoretically relevant predictors to be included in the FSC models, student-level changes in perceptions of collective efficacy and its components were estimated by calculating residual-change scores for each student. The calculation involved regressing the spring measure on the fall measure and saving the residuals. Similar to using the lagged dependent variable (i.e., the fall measurement of self-reported bullying) as a predictor in the change models estimated, this procedure removed the stability between the two points in time and yielded an estimate of change relative to the initial scoring of student respondents in the fall. Hence, the residual-change scores reflected change in the spring relative to where individual students started in the fall (Bohrnstedt 1969; and for a substantive example previously published in Social Problems, see Hochstetler and Shover 1997). The residual-change scores made full use of the longitudinal nature of the data and provided a replication of the LCS models. Determining that the empirical results of estimating the FSC models corroborate those of the LCS models would yield greater confidence in the robust nature of the relation between perceptions of collective efficacy and self-reported bullying within schools and community centers.

Third, the data formed a hierarchical structure, with students nested within schools or community centers. Multilevel modeling is an analytical technique that accommodates this data structure. This technique was explored in Stata/SE 10.1 by using the “xtmixed” estimation procedure (Rabe-Hesketh and Skrondal 2005). As a preliminary assessment, fully unconditional models of the fall and spring measures of perceptions of collective efficacy and bullying perpetration as well as fall-to-spring changes in these two variables (as measured by residual-change scores described above) were estimated separately to determine the variability within and between schools (Raudenbush and Bryk 2002:24). Table 2 shows the results of this analysis.

The intra-class correlation coefficients (ICC) indicated that variability between schools in these measures was highly limited. About 7 to 8 percent was between schools for the fall and spring measures of perceived collective efficacy and self-reported bullying, with only about

Table 2 • Variance Components of the Fall, Spring, and Change Measures for Bullying and Perceived Collective Efficacy

<table>
<thead>
<tr>
<th>Variance Components</th>
<th>Bullying</th>
<th></th>
<th></th>
<th>Collective Efficacy</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fall</td>
<td>Spring</td>
<td>Change</td>
<td>Fall</td>
<td>Spring</td>
<td>Change</td>
</tr>
<tr>
<td>Between schools</td>
<td>.015</td>
<td>.014</td>
<td>.004</td>
<td>.013</td>
<td>.014</td>
<td>.007</td>
</tr>
<tr>
<td>Within schools</td>
<td>.174</td>
<td>.189</td>
<td>.119</td>
<td>.155</td>
<td>.152</td>
<td>.122</td>
</tr>
<tr>
<td>Intra-class correlation (ICC)</td>
<td>.079</td>
<td>.069</td>
<td>.033</td>
<td>.077</td>
<td>.084</td>
<td>.054</td>
</tr>
</tbody>
</table>

Note: \(N = 7,299\) students within 78 schools and community centers
Collective Efficacy and Bullying

3 (bullying) and 5 (perceptions of collective efficacy) percent being between schools for the residual-change measures. This was not a surprising finding since ICCs rarely exceed .20 in studies using multilevel modeling (e.g., Duncan and Raudenbush 1999; Snijders and Bosker 1999). Moreover, among neighborhood-level studies applying the construct of collective efficacy, ICCs typically ranged between .05 and .13 (e.g., Browning and Cagney 2002; Sampson et al. 1999).

However, ordinal least squares (OLS) regression was conducted to estimate the effects of individual perceptions of collective efficacy on individual self-reports of bullying behavior, irrespective of the hierarchical structure of the data. This analytical procedure departed from previous collective efficacy research, which has controlled for individual determinants of “level-one” variation and estimated the effects of collective efficacy as a contextual characteristic at “level two,” with contexts typically being neighborhoods. The rationale for the individual-level focus in the present research is that the items within the collective efficacy index were drawn from student perceptions. As such, they represent characteristics of those individual students. Aggregating perceptual data to form a contextual, school-level measure may be defensible, but focusing the analysis at the individual level was more appropriate given the method of measurement and the substantial within schools, compared to between schools, variability in both self-reported bullying and perceptions of collective efficacy. That said, level-one equations were estimate using multilevel modeling techniques that partition the within and between schools variability in bullying, and the results were virtually identical to the OLS results reported below.

The shift of focus from the contextual to the individual level slightly reframed the issue being addressed. It is no longer how characteristics of social context influence aggregated behavioral outcomes but how individual student perceptions of that context (in this case schools) influence their own self-reported behavior. Reframing the issue necessarily implies a slightly different mechanism of influence linking individual perceptions of collective efficacy and self-reported bullying behavior. Two interrelated mechanisms of influence are viable.

The first mechanism draws from social bonding theory (Hirschi 1969) in that perceiving a high level of cohesion and trust should produce inhibitory effects similar to those reported in previous tests of this theory. The point is illustrated in the application of this theory to another form of behavior with characteristics similar to bullying, that is, a demeaning behavior occurring within a setting of ongoing interaction and a power imbalance—intimate partner violence (e.g., Lackey and Williams 1995). As is well known, Travis Hirschi (1969) identified four dimensions of the social bond (attachment, commitment, involvement, and belief), but attachment is the dimension most relevant to the cohesion and trust component of collective efficacy. Specifically, the more individual students feel a sense of attachment to teachers and peers within schools, the greater will be their sense of cohesion and trust, and the lower will be the likelihood that they will engage in behavior (e.g., bullying) that might jeopardize those interpersonal connections.

The second mechanism of influence draws from deterrence theory. Specifically, perceiving a high likelihood that students and teachers will intervene in bullying situations should produce a deterrent effect, with individual students refraining from bullying behavior because they fear the social costs associated with being sanctioned for such behavior (e.g., Williams and Hawkins 1986). This theoretical reasoning has also been applied to intimate partner violence, that once again is a behavior sharing characteristics with bullying (e.g., Williams and Hawkins 1989a, 1989b, 1992; Williams 2005).

Fourth, data were collected in two consecutive academic years: 2006–2007 and 2007–2008. The issue here is whether perceptions of collective efficacy and self-reported bullying significantly differ between these two years. If the patterns are significantly different, then the samples should be analyzed separately; but if they are similar, the two samples can be combined and treated as one larger sample. To determine the difference or similarity by year, the samples were “stacked,” and two equations were estimated, one for bullying and one for perceptions of collective efficacy. The spring measure was regressed on the fall measure for each estimated equation, which also included a dummy variable for year (0 = 2006–2007 and
1 = 2007–2008) and an interaction term representing the cross product of year by measure obtained in the fall (bullying or collective efficacy, depending on the equation). No statistically significant estimated effects of year or the interaction of year by fall measurement were found, thus justifying the combining of both academic years of data into a single larger sample.

In sum, two models were estimated using OLS regression with multiply imputed and raw data from the two-year combined sample of 7,299 students in 78 schools and community centers: (1) the LCS model involving fall measures of perceived collective efficacy predicting spring self-reports of bullying perpetration, and (2) the FSC model involving individual-level changes in perceived collective efficacy associated with individual-level changes in self-reported bullying perpetration during the academic year. Two empirical questions were addressed. First, are perceptions of collective efficacy measured at a single point in time (in the fall) independently associated with self-reports of involvement in bullying measured at a later point in time (in the spring), and are changes in such perceptions independently associated with changes in these self-reports from the fall to the spring? Second, which of the three separate dimensions of perceived collective efficacy identified above are most strongly associated with bullying perpetration?

Gender, age, and ethnicity were covariates in the multivariate models estimated. As noted above, the sample consisted of three age groups, with youth 13 to 15 years of age having a higher frequency of bullying perpetration (fall mean = 1.49, spring mean = 1.56) than youth 10 to 12 years of age (fall mean = 1.25, spring mean = 1.32) combined with those 16 or older (fall mean = 1.41, spring mean = 1.38). Hence, a dummy variable was created with youth in the middle age category scored one, and those in the other two age categories scored zero. Gender was also a dummy variable, with males scored one and females scored zero. Ethnicity was included as a control variable in the analyses. As noted above, the preponderance of the youth in the sample were non-Latino white (60 percent), with Latinos having the largest representation among the ethnic minorities (23.5 percent). Rather than creating a series of dummy variables representing each ethnic minority, one dummy variable was created, with non-Latino whites scored one and ethnic minorities scored zero. This variable captures ethnicity in terms of majority-minority status, which has been used in other studies of bullying and, more generally, aggressive behavior (Hanish and Guerra 2000a, 2000b). Other possible covariates such as grade point average or family income were not collected because of the sensitive and confidential nature of these issues, particularly in the eyes of parents, teachers, and school administrators.

Empirical Findings

The results of estimating the multivariate model that addressed the first empirical question are shown in Table 3. Notice in Table 3 that age, gender, and ethnicity had small but statistically significant estimated effects on the spring measure of self-reported bullying (LCS model) as well as changes in bullying perpetration from the fall to the spring (FSC model). The frequency of this behavior and changes in this behavior were greater for males than females, greater for youth 13 to 15 than the other two age groups, and greater for ethnic minorities compared to non-Latino whites. Notice further that in the LCS model, collective efficacy measured in the fall had a negative and statistically significant estimated effect on self-reported bullying measured in the spring, consistent with theoretical expectations. Moreover, the estimated effects using the multiply imputed data are quite similar to those using the raw data.

Now consider the FSC model. The estimated effect of the frequency of bullying perpetration measured in the fall on the frequency measured in the spring was statistically significant and strong in magnitude. This effect suggested substantial behavioral stability, meaning self-reported involvement in this behavior tended to remain relative similar between these two points in time. However, behavioral changes did occur, and youth perceptions of overall
Collective efficacy and Bullying

Collective efficacy were significantly and strongly associated with those behavioral changes. Moreover, the estimated effect was in the direction expected: as perceptions of overall collective efficacy increased, self-reported involvement in bullying decreased and vice versa. Like the LCS model, the estimated effects using multiply imputed data were similar to those using the raw data in the FSC model.

The empirical results bearing on the second empirical question are presented in Table 4. Recall the analysis for this question subdivided the overall perceived collective efficacy measure into the three components identified by the factor analysis reported above: cohesion and trust, student informal social control (SISC), and teacher informal social control (TISC). Model 1 included the cohesion and trust measure only, Model 2 included only the SISC measure, Model 3 included only the TISC measure, and Model 4 included the measures of all collective efficacy components. These three components of collective efficacy were estimated separately because the factor analysis showed they were distinct, with determination of independent estimated effects being the issue. The final model (Model 4) was estimated to determine which of these components had the greatest estimated independent effect. The results of estimating these four models using multiply imputed data and raw data were quite comparable, similar to the findings reported in Table 3. Hence, only the findings using the multiply imputed data were reported in Table 4 to conserve space (results based on the raw data are available upon request from the authors).

As in the previous analysis (Table 3), age, gender, and ethnicity continued to have small but statistically significant estimated effects across the LCS and FSC equations in all of the models estimated. Moreover, the estimated effects of the fall on the spring frequency measures of bullying continued to show substantial stability over time (see FSC equations across Models 1 through 4). Now, consider the estimated effects of the three components of perceived collective efficacy.

Taken separately, the measure of cohesion and trust (Model 1) had the strongest negative estimated effects on both the frequency of bullying measured in the spring (LCS) and changes

Table 3 • Estimated Effects of Perceived Collective Efficacy on Self-Reported Bullying within 78 Schools and Community Centers Using Multiply Imputed (MI) and Raw Data

<table>
<thead>
<tr>
<th></th>
<th>Lagged Cross-Section</th>
<th>Fall-to-Spring Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MI</td>
<td>Raw</td>
</tr>
<tr>
<td>Age1</td>
<td>.197*</td>
<td>.199*</td>
</tr>
<tr>
<td></td>
<td>(.012)</td>
<td>(.014)</td>
</tr>
<tr>
<td>Gender2</td>
<td>.137*</td>
<td>.135*</td>
</tr>
<tr>
<td></td>
<td>(.014)</td>
<td>(.014)</td>
</tr>
<tr>
<td>Ethnicity3</td>
<td>−.092*</td>
<td>−.083*</td>
</tr>
<tr>
<td></td>
<td>(.012)</td>
<td>(.015)</td>
</tr>
<tr>
<td>Collective efficacy</td>
<td>−.146*</td>
<td>−.172*</td>
</tr>
<tr>
<td></td>
<td>(.016)</td>
<td>(.017)</td>
</tr>
<tr>
<td>Fall bullying</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Constant</td>
<td>1.745*</td>
<td>1.798*</td>
</tr>
<tr>
<td></td>
<td>(.044)</td>
<td>(.050)</td>
</tr>
<tr>
<td>$R^2$</td>
<td>.107</td>
<td>.093</td>
</tr>
</tbody>
</table>

Notes: MI data ($N = 7,299$); Raw data ($N = 4,231$)

113 to 15 = 1, others = 0
2Males = 1, females = 0
3Non-Latino white = 1, ethnic minorities = 0
*p < .00 (two-tailed tests)
in bullying from the fall to the spring (FSC). The measures of SISC (Model 2) and TISC (Model 3) had small but statistically significant estimated effects in both the LCS and the FSC equations. The negative sign of these estimated effects was in the direction expected. However, when the measures of all three collective efficacy components were included in the same equation (Model 4), the measure of TISC remained statistically significant in both the LCS and the FSC equations, but that was not the case for the measure of SISC. It became statistically insignificant in both equations of Model 4. The measure of cohesion and trust was statistically significant, negative in direction, and much stronger in magnitude compared to the measure of TISC in Model 4. The estimated effect of this component of perceived collective efficacy was almost seven times stronger than the estimated effect of TISC in the LCS equation and almost five times stronger than the estimated effect of TISC in the FSC equation of Model 4.

**Summary and Conclusions**

The results suggest that individual student perceptions of collective efficacy are important for understanding within school variations in bullying. The lagged cross-sectional analysis showed that perceptions of collective efficacy measured in the fall significantly and negatively predicted the frequency of self-reported bullying measured in the spring. Additionally, increases in these perceptions from fall-to-spring were significantly and strongly associated with decreases in the frequency of bullying perpetration between these two points in time.

**Table 4 • Estimated Effects of Cohesion and Trust, Student Informal Social Control (SISC), and Teacher Informal Social Control (TISC) on Bullying**

<table>
<thead>
<tr>
<th>Variables</th>
<th>LCS (b) (se)</th>
<th>FSC (b) (se)</th>
<th>LCS (b) (se)</th>
<th>FSC (b) (se)</th>
<th>LCS (b) (se)</th>
<th>FSC (b) (se)</th>
<th>LCS (b) (se)</th>
<th>FSC (b) (se)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>.182* (.012)</td>
<td>.086* (.010)</td>
<td>.209* (.12)</td>
<td>.101* (.111)</td>
<td>.209* (.12)</td>
<td>.096* (.12)</td>
<td>.183* (.12)</td>
<td>.081* (.12)</td>
</tr>
<tr>
<td>Gender</td>
<td>.141* (.104)</td>
<td>.080* (.103)</td>
<td>.139* (.104)</td>
<td>.083* (.104)</td>
<td>.137* (.12)</td>
<td>.082* (.12)</td>
<td>.139* (.12)</td>
<td>.078* (.12)</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>-.087* (.102)</td>
<td>-.026** (.101)</td>
<td>-.101* (.112)</td>
<td>-.032* (.111)</td>
<td>-.094* (.12)</td>
<td>-.030* (.12)</td>
<td>-.084* (.12)</td>
<td>-.026** (.12)</td>
</tr>
<tr>
<td>Cohesion and trust</td>
<td>-.186* (.105)</td>
<td>-.272* (.103)</td>
<td>-.033* (.101)</td>
<td>-.055* (.109)</td>
<td>-.045* (.008)</td>
<td>-.085* (.007)</td>
<td>-.026* (.009)</td>
<td>-.054* (.007)</td>
</tr>
<tr>
<td>SISC</td>
<td>— —</td>
<td>— —</td>
<td>— —</td>
<td>— —</td>
<td>— —</td>
<td>— —</td>
<td>— —</td>
<td>— —</td>
</tr>
<tr>
<td>TISC</td>
<td>— —</td>
<td>— —</td>
<td>— —</td>
<td>— —</td>
<td>— —</td>
<td>— —</td>
<td>— —</td>
<td>— —</td>
</tr>
<tr>
<td>Fall bullying</td>
<td>— .555* (.016)</td>
<td>— .567* (.016)</td>
<td>— .562* (.017)</td>
<td>— .552* (.017)</td>
<td>— .565* (.003)</td>
<td>— .605* (.007)</td>
<td>— .908* (.007)</td>
<td>— .627* (.007)</td>
</tr>
<tr>
<td>Constant</td>
<td>1.867* (.044)</td>
<td>.619* (.023)</td>
<td>1.431* (.025)</td>
<td>.596* (.024)</td>
<td>1.485* (.027)</td>
<td>.605* (.024)</td>
<td>1.908* (.027)</td>
<td>.627* (.023)</td>
</tr>
<tr>
<td>(R^2)</td>
<td>.119 .465</td>
<td>.092 .414</td>
<td>.096 .431</td>
<td>.121 .473</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: \(N = 7,299\) students within 78 schools and community centers

1LCS = lagged cross-section, FSC = fall-to-spring change
213 to 15 = 1, others = 0
3Males = 1, females = 0
4Non-Latino white = 1, ethnic minorities = 0
\(^*p < .05\) **p < .005** (two-tailed tests)
Disaggregating the perceived collective efficacy measure into the three components identified by the principal components factor analysis showed that cohesion and trust had the most substantial estimated effects on the self-reported frequency of bullying and changes in this behavior during the academic year. Teacher informal social control had statistically significant but weak estimated effects on the frequency of bullying perpetration and changes in this behavior from the fall to the spring. The measure of student informal social control was statistically significant but very weak in magnitude when the cohesion and trust as well as the teacher informal social control measures were excluded from the estimation procedure, but it became statistically insignificant when the measures of all three collective efficacy components were included in the same equation. In drawing conclusions and suggesting directions for future research, three important contributions of this study are highlighted.

First, an important innovation of this study is a precise specification of the mechanisms by which school context influences bullying behavior. As noted earlier, although there have been studies examining the relations between school context and bullying, most of these studies have examined more global constructs such as school climate. In contrast, the construct of collective efficacy denotes relationships as characteristics of settings (in this case, schools) that directly influence bullying behaviors. Bullying is less likely in schools characterized by cohesion and trust among students and teachers (an inhibitory influence of attachments) and a perception that others, most importantly teachers, will intervene to prevent bullying (a form of general deterrence).

The finding that teacher informal social control was more influential than student informal social control is an important contribution to the burgeoning research on collective efficacy. An assumption of neighborhood studies of collective efficacy is that adults have a vested interest in protecting children and promoting their welfare for the good of the community (Sampson 2006). However, bullying is a complex social behavior that is also sustained among children and adolescents, in part, because of its role in establishing and maintaining social hierarchies and peer networks (Espelage et al. 2003; Guerra, Williams, and Sadek forthcoming). Unlike street crime and violence, a relatively weak consensus may exist, at least on the part of students, on whether bullying actually works against the common good. This point might account for the weak and ultimately insignificant effect of the student measure of informal social control on bullying perpetration.

A second contribution of the present study is the extension of collective efficacy theory to contexts beyond neighborhoods and outcomes other than crime and violence. Consistent with studies of neighborhoods, relatively little between school variation in collective efficacy was found. However, it still may be the case that even small differences contribute to school-level differences in bullying, just as variation in collective efficacy between neighborhoods, albeit relatively small, has been linked with variations in violent crime. In the present study, the role of within school variation and how this impacts individual bullying behavior was emphasized. Specifically, within school variation in perceptions of collective efficacy was found to predict within school variation in frequencies of bullying over two points in time. It may be that perceptions of contextual influences are particularly important in driving behavior beyond what is objectively “real.” For example, the perception that a teacher will intervene to stop bullying (although presumably based at least somewhat on actual probabilities) should have an important deterrent effect on individual behavior regardless of whether that perception is accurate (consistent with the actual probability of intervention). A logical next question is whether collective efficacy cast more broadly would influence not only bullying but a range of other school effectiveness outcomes, such as academic achievement, school dropout rates, or graduation rates.

One of the key components of collective efficacy, social cohesion and trust, has long been examined in relation to learning and behavioral outcomes. More recently, specific dimensions of cohesion and trust suggested by the sociological literature on social capital have been studied in schools. For example, Anthony Bryk and Barbara Schneider (2002) highlight the importance of relational trust as a key ingredient of effective schools. Relational trust derives
from a network of sustained relationships whereby individuals trust each other to fulfill the mandates of their specific role—parent, teacher, student, administrator, etc. When participants believe others will act competently according to the requirements of their role and their behavior confirms this, mutual trust emerges. This model provides a more detailed description of trust in social relationships and its relevance to school improvement, but it lacks the action-oriented aspects of relationships found in the construct of collective efficacy. Stated otherwise, although trusting relationships provide a meaningful foundation for school success, they must also be mobilized to achieve concrete goals. Collective efficacy theory provides an organizational framework for understanding school context in terms of the importance of both trusting relationships and collective action. As Sampson (2006) notes “the key theoretical point is that networks have to be activated to be ultimately meaningful” (p. 153).

The themes discussed above focus on the utility of collective efficacy theory for understanding bullying within schools and possibly for studying other components of school effectiveness. In this manner, collective efficacy is a useful approach for schools that suggests specific direction for prevention, intervention, and school improvement. However, a third contribution of the present study is that it constitutes a direct test of sociological theory in a specific and well-defined context with longitudinal data. As noted previously, most of the work in this area has examined social and organizational characteristics of neighborhoods and their linkage to lower levels of community violence (Sampson 2006; Sampson et al. 1997). Yet, schools provide even greater opportunities than neighborhoods for individuals to monitor and shape behavior. They are concentrated in a single location and require daily interactions among many of the same people over a significant length of time. As such, schools provide a new venue for testing the theoretical underpinnings of collective efficacy in a different context.

Given the limited between but substantial within school variability in perceived collective efficacy found in the present study, future research should address possible internal heterogeneity in the organizational characteristics of schools. Specifically, collective efficacy may operate more at the level of classrooms or grade levels rather than school wide, and such a possibility may be greater in middle or high schools where students move from class-to-class and teacher-to-teacher, compared to elementary schools where students remain in a single classroom with a single teacher throughout most of the day. Teacher monitoring and involvement may be more logistically possible and effective in elementary schools, and self (student)-monitoring might be more effective in middle and high schools, with that skill derived at least in part from connectedness, relational trust, and a belief that support from teachers and peers would be forthcoming. Of course, these speculations await further research.

In closing, a number of limitations of the present research should be considered. First, our findings are based on an analysis of data over the course of a single school year. A more extended longitudinal study would be desirable. Second, although we include a range of ages from childhood through adolescence, it is important to study each age group separately. We would expect collective efficacy to operate differently as children get older, particularly in terms of the complex ways that adolescents may intervene, as well as understanding their perceptions of the “common good.” Overall, our findings suggest that an important role for teachers is to monitor student behavior. Students also influence each other’s behavior through peer sanctions and emergent normative beliefs. Yet, collective efficacy traditionally has emphasized only the willingness to intervene by adults. In a related study that included both quantitative and qualitative findings (Guerra et al. forthcoming), adult intervention to prevent bullying was particularly effective for elementary school children, as suggested above, but had a lesser impact during adolescence. Third, the focus of the present research was on willingness to intervene only in terms of preventing bullying. Determining other aspects of the common good (and how this is defined by both students and adults) bearing on school contextual influences on relevant outcomes would also be important. Still, the findings reported here suggest that collective efficacy is a particularly useful explanation for understanding contextual influences on social behavior when contexts are bounded and regulation of behavior is an important function of individuals in that context.
Appendix • Means and Standard Deviations (SD) of the Fall and Spring Measures of the Variables Included in the Analyses Using the Multiply Imputed (MI) and Raw Data

<table>
<thead>
<tr>
<th>Variables</th>
<th>MI Data</th>
<th>Raw Data</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Means</td>
<td>SD</td>
</tr>
<tr>
<td>CE: Fall</td>
<td>2.664</td>
<td>.409</td>
</tr>
<tr>
<td>Spring</td>
<td>2.613</td>
<td>.427</td>
</tr>
<tr>
<td>CT: Fall</td>
<td>2.731</td>
<td>.426</td>
</tr>
<tr>
<td>Spring</td>
<td>2.674</td>
<td>.457</td>
</tr>
<tr>
<td>SISC: Fall</td>
<td>2.251</td>
<td>.667</td>
</tr>
<tr>
<td>Spring</td>
<td>2.237</td>
<td>.652</td>
</tr>
<tr>
<td>TISC: Fall</td>
<td>2.939</td>
<td>.858</td>
</tr>
<tr>
<td>Spring</td>
<td>2.878</td>
<td>.856</td>
</tr>
<tr>
<td>Bullying: Fall</td>
<td>1.409</td>
<td>.423</td>
</tr>
<tr>
<td>Spring</td>
<td>1.466</td>
<td>.500</td>
</tr>
</tbody>
</table>

CE = collective efficacy
CT = cohesion and trust
SISC = student informal social control
TISC = teacher informal social control

References


