



The development of academic competence among adolescents who bully and who are bullied[☆]

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ABSTRACT

Using data from the first three waves (Grades 5, 6, and 7) of the 4-H Study of Positive Youth Development, this study assessed if being a bully or being a victim accounts for an adolescent's academic competence, if selected contextual and individual variables impact an adolescent's academic competence, and if such impact differs in relation to an adolescent's bullying status. The results of random coefficient hierarchical regression analyses indicated that being a bully predicted lower grades across time, and that being a bully was more detrimental for girls than for boys. Being a bully and being a victim negatively predicted self-perceived academic competence, but these predictive effects did not change over time or differ by sex. Teacher support positively predicted grades and greater parent support and teacher support independently predicted higher self-perceived academic competence. Greater educational expectations and school engagement independently predicted higher self-reported grades, while these two predictors positively interacted in explaining self-perceived academic competence. Unexpectedly, peer support negatively predicted self-reported grades for victims, and negatively predicted self-perceived academic competence for bullies. We discuss the importance of addressing the issue of academic competence in bullying interventions, as well as the utility of capitalizing on developmental assets in promoting academic competence among adolescents who bully and who are bullied.

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School bullying, sometimes also called peer victimization or peer harassment, is widely defined as a subset of aggressive behaviors among school children and adolescents. A young person is being bullied when he or she is repeatedly exposed to intentional negative actions on the part of one or more other youth. The negative actions include physical assaults, cruel teasing, being called “bad names,” spreading rumors, and social exclusion. Usually, the youth who is bullied is unable to effectively defend himself or herself from being physically and/or emotionally hurt by such negative actions (Olweus, 1993, 1999; Smith & Morita, 1999).

Bullying entails a “systematic abuse of power” (Rigby, 2002), in which young people have different bullying statuses. Theoretically, youth who are directly involved in bullying can have any of three statuses: bullies who perpetrate negative actions on peers; victims who are targets of negative actions perpetrated by peers; and bully–victims who bully peers in certain situations and are bullied by peers in other situations. Researchers operationally define these three bullying statuses differently using various tools, including self report, peer nomination, coding videotape, and so on (e.g., Nansel et al., 2001; O'Connell, Pepler, & Craig, 1999). Bullying is a complex relationship problem and group process, and even those who are not directly involved in bullying play certain

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roles (Atria & Spiel, 2007; Pepler, 2006), such as bystanders who passively witness bullying incidents, facilitators of the bullies, or helpers of the victims (O'Connell et al., 1999; Smith, 2004). Youth who are not directly involved in bullying are labeled as non-involved or bystanders (Smith, 2004; Yang, Chung, & Kim, 2003).

Over the past three decades, school bullying has been increasingly recognized as a widespread issue that has important implications for youth well-being (Smith, 2004; Smith & Morita, 1999). For example, in a survey of approximately 130,000 primary school and junior high school students in Norway, about 15% of these students were involved in bullying with some regularity. Approximately 9% were victims, 7% were bullies, and 1.6% were bully–victims (Olweus, 1993, 1999). Nansel et al. (2001) used similar measures of bullying as Olweus to study a nationally representative sample of U.S. youth in Grades 6 through 10. Among the 15,686 youth surveyed, a total of 29.9% reported being involved in bullying, with 13.0% as bullies, 10.6% as victims, and 6.3% as bully–victims (Nansel et al., 2001).

Being bullied by peers predicts higher anxiety, greater depression, low self-esteem, peer rejection, suicidal behaviors, and aggression (e.g., Hodges, Boivin, Vitaro, & Bukowski, 1999; Rigby, 2001). Recent research suggests that bullying peers and being bullied by peers are correlated with substance use and fighting (Nansel, Overpeck, Haynie, Ruan, & Scheidt, 2003). Youth who bully peers are more likely to carry weapons and be involved in street violence as either perpetrators or victims (Andershed, Kerr, & Stattin, 2001). Early experience as a bully in school is a significant predictor of juvenile delinquency, later affiliation with gangs, and criminality in adulthood (Hazler, 1994; Holmes & Brandenburg-Ayres, 1998; Olweus, 1993). In addition to these negative correlates in social and emotional domains, research also indicates that bullies and victims tend to have lower academic competence than a comparison group (e.g., Nansel et al., 2001; Yang et al., 2003). Specifically, in a national study among U.S. youth, bullies were more likely to report below average self-perceived school performance than comparison group, with an odds ratio of 1.82 (95% CI: 1.33–2.47) (Nansel et al., 2001). Moreover, higher scores on the Peer Victimization Scale, which indexes greater victimization, were associated with lower self-perceived academic competence (Callaghan & Joseph, 1995). In a study of 2565 Korean junior high and high school adolescents aged 12–18, bullies and victims reported lower GPA scores than a comparison group (Yang et al., 2003).

The experience of being bullied predicts depressive symptoms (Callaghan & Joseph, 1995), and depressive symptoms mediate the experience of being bullied and poor academic competence (Juvonen, Nishina, & Graham, 2000). Victims are also more likely to have difficulties with attention regulation and concentration (Schwartz, McFadyen-Ketchum, Dodge, Pettit, & Bates, 1998). Weakened attention regulation and concentration may partly account for victims' low academic competence, as it is hard for victims to focus on their school work while trying to avoid being bullied (Hazler, 1994). Moreover, victims feel more stress at school and tend to skip school to avoid being picked on (Dupper & Meyer-Adams, 2002; Hazler, Hoover, & Oliver, 1991; Yang et al., 2003). As being bullied predicts greater desire to avoid school (Kochenderfer & Ladd, 1996), truancy and/or absenteeism caused by bullying can also have negative effects on learning, and thus on academic competence.

Little research explores why bullying others is associated with poor academic competence. Studies suggest that adolescents who bully tend to be engaged in other problem behaviors, including substance abuse and serious violent behaviors (Andershed et al., 2001; Nansel et al., 2003), and they are more likely to participate in juvenile delinquency and gang activities (Holmes & Brandenburg-Ayres, 1998). Therefore, bullies may spend less time and energy on school work, and hence have low academic competence.

However, the existing research about the relationship between bullying and low academic competence has two key limitations that should be noted. First, although there are observed differences in academic competence between youth who are bullies or victims and youth who are not directly involved in bullying, extant empirical evidence is not adequate to attribute such differences to bullying. This problem is of course the well-known “third variable” issue in interrelational research, that is, a “third variable” may predict both being a bully or a victim and low academic competence. Second, assuming that bullying undermines academic competence, little is known about what can enhance the development of academic competence among youth who bully and who are bullied.

Thus, there is certainly not sufficient evidence to blame bullying for causing low academic competence. In addition, temporal links between bullying and academic behaviors are also uncertain. Most findings about the relationships between bullying and academic competence are derived from cross-sectional data (e.g., Nansel et al., 2001; Yang et al., 2003). Such studies are not able to demonstrate antecedent–consequent relationships between being a bully or being a victim and low academic competence. As Nansel et al. (2001) suggested, longitudinal studies are needed to provide information about the consequences of bullying peers and being bullied by peers, including impact on academic competence. Juvonen et al. (2000) reported one of the few studies about bullying and academic competence that used longitudinal data. The results showed that changes in perceived experiences of being bullied, over the one-year period, predicted subsequent GPA.

In addition, because of the cross-sectional nature of most research in this area, it is impossible to control for prior years' academic competence when examining the relationships between bullying and academic competence. In order to partial out this confounding effect, prior years' academic competence should be included in longitudinal research about the relationships between bullying and academic competence. This integration can be achieved by constructing individual growth models of academic competence by using random coefficient regression for longitudinal data (Cohen, Cohen, West, & Aiken, 2003).

Furthermore, few studies control for demographic background variables in attempting to predict academic competence (Nansel et al., 2001; Yang et al., 2003). These demographic characteristics include youth sex (Lamb, Hwang, Ketterlinus, & Fracasso, 1999), family socioeconomic status (SES) (Christian, Morrison, & Bryant, 1998; Englund, Luckner, Whaley, & Egeland, 2004; Morrison, Rimm-Kauffman, & Pianta, 2003), and race/ethnicity (National Center for Education Statistics, 2005; Pong, Hao, & Gardner, 2005). Studies have found that these demographic variables predict academic competence for youth in various

contexts (Morrison et al., 2003). For instance, longitudinal research indicates that a substantial proportion (about 33%) of the variance in academic competence in middle school is accounted for by the demographic background factors of youth, including sex and birth mother education (Morrison et al., 2003; Mullis, Rathge, & Mullis., 2003). In short, in order to examine if bullying uniquely impacts academic competence above and beyond demographic background, it is necessary to include demographic variables in analyses.

In order to address these limitations, the present study examines if, and, to what extent, being a bully or being a victim accounts for an adolescent's academic competence above and beyond the influences of demographic background (sex and family SES) and prior years' academic competence. Using data from the 4-H Study of Positive Youth Development (PYD; Lerner et al., 2005; Phelps et al., 2007), a longitudinal investigation involving youth from across the U.S., the present study involved data about academic competence that were collected at three time points over a period of three years. This design, and the computation of individual growth models of academic competence, enabled the disentangling of the predictive effects of demographic background and prior years' academic competence, and as well, addressed the issue of regression to the mean. This approach allowed us to model the potential antecedent–consequence relationships between bullying peers and being bullied by peers on academic competence. Accordingly, we hypothesized that being a bully, as well as being a victim, has a negative impact on academic competence, over and above the influences of demographic background and prior years' academic competence. In addition, we expected to find that the degree to which being a bully and being a victim impacted academic competence may differ, because bullies and victims have different psychological characteristics that may mediate academic outcomes.

Assuming that bullying can negatively impact youth academic competence, as alluded to by the cross-sectional research, we nevertheless still have a limited understanding of the diversity in academic outcomes of the youth who bully and who are bullied. Why do some youth who are bullies and/or victims not necessarily have low academic competence (Hanish & Guerra, 2002)? What can possibly enhance the development of academic competence among youth who bully and who are bullied? The developmental systems perspective provides a useful theoretical framework to understand such questions. This perspective orients research toward multiple types of developmental outcomes and factors that promote such diverse outcomes, particularly positive outcomes. Developmental systems theory underscores the idea that plasticity is an inherent characteristic of human development (Lerner, 2002, 2006). Plasticity is the potential for systematic changes across individual development, and arises as a result of the coactions between contexts and the individual. Plasticity in human development suggests that one may be optimistic about finding combinations of individual attributes and of contextual characteristics, ones that serve as resources, or assets, in enhancing development, that may promote positive developmental outcomes (Lerner, 2002, 2004). Applying this theoretical perspective in the context of school bullying and academic development, we hypothesized that youth who bully and who are bullied have the potential for positive academic development just as their peers who are not directly involved in bullying do. In other words, given adequate positive contextual assets and individual factors, youth who are bullies and victims can develop high academic competence.

Based on a developmental systems theoretical perspective (Lerner, 2006), we examined also the roles of selected contextual and individual variables in the development of academic competence for youth who bully and who are bullied. The selected contextual and individual variables include parent support, teacher support, peer support, educational expectations, and school engagement. These variables have been found to account for variations in academic outcomes, particularly for youth who are at risk of poor academic outcomes. Such risks exist for ethnic minority youth, for youth having low family SES, and for youth coming from divorced or remarried families (Boyce Rodgers & Rose, 2001; Chen, 2005; Englund et al., 2004; Sirin & Rogers-Sirin, 2004). As such, we asked two additional questions in this study: To what extent, if at all, do selected contextual and individual variables enhance an adolescent's academic competence, controlling for demographic background, prior years' academic competence, and bullying status? Do these selected variables enhance an adolescent's academic competence differently, depending on his or her bullying status?

To answer these questions, we included the selected contextual and individual variables in random coefficient hierarchical regression models after entering time, demographic variables, and bullying status. We expected that the selected variables would act as developmental assets for enhancing academic competence in the context of bullying. In turn, given that youth with different bullying statuses have more or less different social and emotional characteristics, we hypothesized that these selected contextual and individual variables would enhance academic competence differently for youth with different bullying statuses.

In sum, taking a developmental systems theoretical perspective, we examined three key research questions in order to expand our knowledge of the relationships among bullying, developmental assets, and academic competence: 1. If, and, to what extent, does being a bully or being a victim, account for an adolescent's academic competence above and beyond the influences of demographic background and prior years' academic competence?; 2. To what extent, if at all, do parent support, teacher support, peer support, educational expectations, and school engagement impact an adolescent's academic competence, controlling for demographic background, prior years' academic competence, and bullying status?; 3. Do parent support, teacher support, peer support, educational expectations, and school engagement impact an adolescent's academic competence differently, depending on his or her bullying status?

Method

The present study was conducted as a part of the 4-H Study of Positive Youth Development (PYD), a longitudinal study that began in 2002 with a sample of about 1700 5th grade youth and their parents (or guardians) from 13 states in the United States. The 4-H Study was designed to test a theoretical model about the role of developmental assets in promoting PYD and in reducing

problem and risk behaviors. PYD is conceptualized by the “Five Cs” of competence, confidence, connection, character, and caring, and the “sixth C” of contribution (Lerner, 2004). More details of the methodology of the 4-H Study have been presented in prior reports (Gestsdottir & Lerner, 2007; Jellic, Bobek, Phelps, Lerner, Lerner, 2007; Lerner et al., 2005; Ma, Phelps, Lerner, Lerner, in press; Phelps et al., 2007; Theokas & Lerner, 2006). We present here the features of methodology pertinent to the focus of this study.

Design

The 4-H Study uses a form of longitudinal sequential design (Baltes, Reesse, & Nesselrode, 1988). Data from fifth graders were gathered in Wave 1 of the study during the 2002–2003 school year, and these fifth graders were the initial cohort, Cohort 1, in this design and the only cohort in Wave 1. In order to maintain at least initial levels of power for within-time analyses and to assess the effects of retesting, subsequent waves of the study involved the addition of a “retest control” cohort of youth. The newly added retest control cohort was recruited from youth in the current grade level of the initial cohort, and the additional cohorts were then followed longitudinally. For example, in Wave 2 of the 4-H Study, the current grade level of the initial cohort was Grade 6. As such, a retest control group of sixth graders were added to the study, and these youth became members of the second longitudinal cohort, Cohort 2.

Participants

Wave 1 participants of the 4-H Study came from 40 cities or towns located in 13 states. Schools were chosen as the main method for collecting the sample. Assessments were conducted in 61 schools and in three after-school programs. Participants were 1722 fifth graders adolescents (52% females; mean age = 10.9 years, $SD = 0.45$ years; 48% males, mean age = 11.1 years, $SD = 0.5$ years) and 1139 of their parents.

In Wave 2, 983 youth in the initial cohort (Cohort 1) during Wave 1 were retested (54% females; 46% males). A “retest control” sample of 889 sixth graders was added (60.7% females; 39.3% males) as Cohort 2. The combination of the 983 longitudinal (Wave 1–Wave 2) participants from the initial cohort and the 889 retest control Cohort 2 resulted in a total of 1872 sixth grade participants at Wave 2 (56% females; mean age = 12.1 years, $SD = 0.7$ years; 44% males, mean age = 12.1 years, $SD = 0.7$ years) with 1312 of their parents. In Wave 2, youth were sampled from 60 schools and five after-school programs in 18 states across the nation.

In Wave 3, a total 1182 Wave 2 youth were retested (59% females; 41% males). A new retest control sample of 890 seventh graders (64% female; 36% male) was added as Cohort 3. Overall, there were 2072 youth in Wave 3 (60% females; mean age = 13.1 years, $SD = 0.9$ years; 40% males, mean age = 13.2 years, $SD = 0.8$ years) with 1181 of their parents. The youth were sampled from 45 schools and 29 after-school programs in 17 states across the nation. In Waves 1, 2, and 3, the participants were diverse in regard to geographic region (states), rural/urban location, race/ethnicity, and family SES (Jellic et al., 2007; Phelps et al., 2007).

Attrition in the 4-H Study sample is not randomly distributed across schools. For instance, in Wave 2, some principals withdrew consent for their schools to participate, and thus these students “dropped out” without our having the opportunity to ask them if they wanted to remain in the study. For instance, in one state we were unable to collect data in Wave 2, resulting in the loss of over 250 participants. Overall, we lost 561 out of 1722 participants in Wave 2 because of the absence of principal or superintendent permission to continue. However, attrition from Wave 1 to Wave 2 for students who were allowed to be asked to remain in the study was only 10%. Compared with Wave 1 youth who did not continue into Wave 2, those who did continue were slightly more advantaged as indexed by household income and birth mother education, and were more likely to be European American. There was no significant difference in household income or birth mother education when comparing Wave 2 youth who continued into Wave 3 with those who dropped out. However, Wave 2 youth who continued into Wave 3 were more likely to be European American.

In the present study, data are derived from the first three waves (Grades 5, 6, and 7) of the 4-H Study to construct individual growth models of academic competence across a period of three years. An adolescent was selected for the present study if he or she met both of the two criteria: being a longitudinal case; and having valid data on both the two general bullying questions in Waves 2 and 3. An adolescent is a longitudinal case if he or she came from any of the following four categories: participated in Waves 1 and 2; participated in Waves 2 and 3; participated in Waves 1 and 3; or participated in Waves 1, 2, and 3. Although not all of these adolescents in this longitudinal sample were in Waves 1, 2, and 3, random coefficient regression analysis permits analyses of the longitudinal changes in academic competence across Waves 1 through 3 with missing data points (Singer & Willett, 2003). In order to have valid data on both of the two general bullying questions used in both Wave 2 and Wave 3 (see below), a longitudinal case in the present study had to be in Waves 2 and 3 or in Waves 1, 2, and 3, because bullying questions were assessed in Waves 2 and 3, but not in Wave 1.

Across Wave 1 through Wave 3 of the 4-H Study, 1581 (45%) of the 3476 adolescents were longitudinal cases, as defined by the above-mentioned four categories. Compared with adolescents who were not longitudinal cases, the adolescents who were longitudinal cases tended to have higher self-reported grades in Grades 5 and 6, self-perceived academic competence in Grade 7, and overall school engagement ($ps < 0.01$). Nevertheless, the longitudinal cases and non-longitudinal cases were not different in terms of self-perceived academic competence in Grades 5 and 6, self-reported grades in Grade 7, birth mother education, household per capita income, parent support, teacher support, peer support, or educational expectations.

Of these 1581 longitudinal cases, 782 (49%) did not have valid bullying data, and 799 (51%) had valid bullying data. There were no differences in birth mother education, household per capita income, parent support, teacher support, or peer support between

adolescents with valid bullying data and adolescents without valid bullying data. However, adolescents with valid bullying data had higher scores on all the six indicators of academic competence (self-reported grades and self-perceived academic competence from Wave 1 through Wave 3), educational expectations, and school engagement ($ps < 0.01$).

Among the 799 longitudinal cases with valid bullying data, 28 (3.5%) were bullies, 92 (11.5%) were victims, 11 (1.4%) were bully–victims, and 668 (83.6%) were in a non-bullying comparison group in Grade 6. In Grade 7, 30 (3.8%) were bullies, 65 (8.1%) were victims, 12 (1.5%) were bully–victims, and 692 (86.6%) were in the comparison group. We explain how these categories were created in subsection 2.3.2. Post-hoc Tukey tests following between-group fixed-effect ANOVAs suggested that bully–victims had lower self-reported grades in Grade 5 than victims and comparison group members ($ps < 0.01$). Bully–victims had lower parent, teacher, and peer support than comparison group members ($ps < 0.01$). However, bully–victims were not different from bullies, victims, or comparison group members in self-reported grades in Grades 6 and 7, self-perceived academic competence in Grades 5, 6, and 7, birth mother education, household per capita income, educational expectations, or school engagement. It may be that the small number of bully–victims did not provide enough power to test for differences. Because the small number of bully–victims is problematic in statistical analysis, they were excluded from further analyses. As a result, 776 adolescents, including bullies, victims, and comparison group members, were kept as the longitudinal sample for data analysis in the present study.

Measures

Measures used in this study are derived from the 4-H Study Student Questionnaire (SQ) or Parent Questionnaire (PQ) (Lerner et al., 2005).

Demographic background variables

Youth were asked to indicate their sex and race/ethnicity. Their parents were asked to provide information about family SES, including household income and the biological mother's highest level of education (maternal education). Maternal education ranged from eight years (eighth grade or less) to 20 years (doctoral degree). Because maternal education is a powerful predictor of the child's academic competence (Featherman & Hauser, 1976, 1978; Hauser & Featherman, 1974; Riala, Isohanni, Jokelainen, Jones, & Isohanni, 2003), this variable was used as the indicator of family SES to be controlled in the models predicting academic competence.

Across Waves 1 to 3, maternal education scores were positively associated with each other ($rs = 0.93$ – 0.95 , $ps < 0.01$). Repeated measures within-subject ANOVAs suggested that maternal education did not change across waves, $F(1, 231) = 1.51$, $p > 0.05$. In order to reduce missing data, maternal education was treated as time-invariant, that is, it was assumed not to change over time. As such, overall maternal education score was calculated for each adolescent by computing the mean of the Wave 1, Wave 2, and Wave 3 maternal education scores.

Bullying status

Researchers apply different methods to operationally define bullying behaviors: some use peer nomination, some others use self report, and some use researchers' observation (Hanish & Guerra, 2002; Nansel et al., 2001; O'Connell et al., 1999). We used the two global questions from the Olweus Bullying Questionnaire (Olweus, 1996) to assess an adolescent's bullying status in Waves 2 and 3 of the 4-H Study. Only Wave 2 and Wave 3 bullying status data are available, however, as questions about bullying were not part of the 4-H Study student questionnaire in Wave 1.

The Olweus Bullying Questionnaire is, arguably, the most widely used tool for studying school bullying and has good psychometric properties (Solberg & Olweus, 2003). As suggested by Olweus (1996), we provided a short and readable introductory paragraph to describe the main characteristics of bullying, including power imbalance and intention to hurt. The common formats of bullying, such as physical attack, cruel teasing, and social exclusion, were also described in the introduction paragraph. We then presented the two global questions about bullying: 1. "How often have you taken part in bullying another child or other children?" and 2. "How often have you been bullied?" in the past couple of months. Response alternatives are "never," "only once or twice," "two or three times a month," "about once a week," and "several times a week."

In earlier work, higher scores on the first bullying question were correlated with higher problem behaviors (Ma et al., in press), such as alcohol and drug use ($r = 0.34$, $p < 0.01$); higher delinquency ($r = 0.41$, $p < 0.01$); higher depression, as indexed by the Center for Epidemiological Studies Depression Scale (CESD, Radloff, 1977) ($r = 0.22$, $p < 0.01$); and lower sympathy as indexed by the Eisenberg's Sympathy Scale (Eisenberg et al., 1996) ($r = 0.16$, $p < 0.01$). Higher scores on the second bullying question were associated with higher levels of depression, as indicated by the CESD ($r = 0.25$, $p < 0.01$); lower social competence ($r = 0.22$, $p < 0.01$); and lower self-worth, as indexed by Self-Perception Profile for Children (SPPC, Harter, 1983) ($r = 0.15$, $p < 0.01$) (Ma et al., in press). Consistent with the literature, these correlations provide evidence for the validity of the two questions about experiences of bullying peers and being bullied by peers (Nansel et al., 2001; Smith et al., 1999; Solberg & Olweus, 2003).

Following the "two or three times a month" cutoff point suggested by Solberg and Olweus (2003), answers to these two bullying questions were recoded into two dichotomous variables: "bullying peers" and "being bullied by peers." "Bullying peers" = 1, if the answer to the first bullying question is "two or three times a month," "about once a week," or "several times a week;" and if the answer to the first question is "never" or "only once or twice," "bullying peers" = 0. Similarly, "being bullied by peers" = 1, if the answer to the second bullying question is "two or three times a month," "about once a week," or "several times a week;" if the answer to the second question is "never" or "only once or twice," "bullying peers" = 0. Using data derived from the New Bergen Project Against Bullying,

which involved 5171 students in Grades 5 through 9 from 37 schools, Solberg and Olweus (2003) empirically rationalized the cutoff point of “two or three times a month.” Their study suggested that youth who are classified as bullies reported higher level of aggression and antisocial behaviors, and youth who are categorized as victims tended to have lower self-esteem and be more depressed (Solberg & Olweus, 2003).

Three dummy variables, Bully (being a bully versus others), Victim (being a victim versus others), and bully–victim (being a bully–victim versus others), were created to indicate an adolescent's bullying status. The reference group for these dummy variables is the comparison group, “none of the above.” Although the study of the heterogeneity of the comparison group, who are not directly involved in bullying, is an interesting topic (O'Connell et al., 1999; Smith, 2004), it is beyond the scope of the present study. As such, there are potentially four bullying statuses measured in this study: bully, victim, bully–victim, and comparison group.

As noted, there were 799 adolescents who were longitudinal cases and who had valid bullying status data. Among these adolescents, 165 (20.7%) changed their bullying statuses from Wave 2 to Wave 3, while 634 (79.3%) did not change their bullying statuses. Consequently, these three dichotomized dummy variables were treated as time-varying variables.

Contextual variables

Three contextual variables, parent support, teacher support, and peer support, were included in this study as potential developmental assets for academic competence among adolescents who bully and who are bullied. Information about these contextual variables was collected through adolescents' self report in the 4-H Study SQ in Waves 1, 2, and 3.

Parent support was measured by the mean score of the following scales/subscales in the SQ: parental monitoring (Small & Kerns, 1993), and maternal warmth and paternal warmth from the Child's Report of Parenting Behaviors Inventory (CRPBI, Schludermann & Schludermann, 1970). The items that measure parent support include “My parents know where I am after school,” “My mother/father speaks to me in a warm and friendly way,” and “My mother/father cheers me up when I am upset.” The responses could range from 1 = almost never to 5 = almost always, with higher scores indicating higher parental monitoring or nurturance. These scales and subscales have satisfactory psychometric properties in the 4-H Study (Lerner et al., 2005). Cronbach's alpha for parent support in the present study was 0.84. Parent support score could range from 1 to 5, with higher scores indicating higher parent support.

Teacher support was scored as the mean of three teacher emotional support items and three teacher discipline items in the Profiles of Student Life: Attitudes and Behaviors, a self-report instrument developed by the Search Institute for youth in Grades 6 through 12 (PSL-AB, Leffert et al., 1998). The items include “My teachers really care about me” and “Teachers at school push me to be the best I can be.” Responses could range from 1 = strongly disagree to 5 = strongly agree. Higher scores indicated higher support. The items have good psychometric properties in the 4-H Study (Lerner et al., 2005), i.e., Cronbach's alpha for teacher support = 0.85.

Peer support was measured by the peer support scale from the Teen Assessment Project (TAP) Survey Question Bank (Small & Rodgers, 1995). This scale has four items and assesses adolescents' relationships with friends, such as “I trust my friends” and “I feel my friends are good friends.” Peer support score could range from 1 to 5, with higher scores indicating higher peer support. Lerner et al. (2005) report that Cronbach's alpha for peer support = 0.89.

In a follow-up analysis conducted to better understand the influences of peer support on academic competence, we used a four-item scale called “friends' influence,” taken from the PSL-AB (Leffert et al., 1998). This scale includes questions such as “among the people you consider to be your closest friends, how many would you say do well in school” and “among the people you consider to be your closest friends, how many would you say get into trouble in school.” The friends' influence score was the mean of these four items and could range from 1 to 5, with higher scores corresponding to more positive friends' influence. Lerner et al. (2005) report that Cronbach's alpha for friends' influence = 0.67. Friends' influence was treated as a separate variable and not incorporated as a part of the variable “peer support.”

Individual variables

Two individual variables were included in this study as potential developmental assets for enhancing academic competence: educational expectations and school engagement. Information about these two variables was collected from the SQ in Waves 1, 2, and 3 data collection.

In this study, “educational expectations” was a measure of the adolescent's perceptions about his or her future educational opportunities. We assessed educational expectations by asking the adolescents, “What are your chances for going to college?” The score could range from 1 = very low to 5 = very high, with higher scores corresponding to higher educational expectations. A mean score of four items pertaining to school engagement and working hard in school were taken from the PSL-AB (Leffert et al., 1998) to measure the extent to which an adolescent is engaged in his or her school work. Research suggests that these four items represent adolescents' behavioral school engagement and predict academic competence (Li, 2007). A sample question was “How often do you come to class without your homework finished?” The school engagement variable was scored so that higher values represented greater levels of school engagement. The score could range from 1 to 5. Lerner et al. (2005) report that Cronbach's alpha for school engagement = 0.71.

For each of the three contextual variables and two individual variables, Wave 1, Wave 2, and Wave 3 scores were positively associated with each other (parent support: $r_s = 0.42$ to 0.55 , $p_s < 0.01$; teacher support: $r_s = 0.27$ to 0.48 , $p_s < 0.01$; peer support: $r_s = 0.14$ to 0.36 , $p_s < 0.01$; educational expectations: $r_s = 0.32$ to 0.46 , $p_s < 0.01$; and school engagement: $r_s = 0.28$ to 0.46 , $p_s < 0.01$). In addition, repeated measure within-subject ANOVAs suggested that parent support, $F(1, 482) = 16.56$, $p < 0.001$, teacher support, $F(1, 416) =$

106.10, $p < 0.001$, peer support, $F(1, 481) = 12.31$, $p < 0.001$, and educational expectations, $F(1, 429) = 7.15$, $p < 0.01$, changed across Waves 1 through 3. Only school engagement did not change across Waves 1 through 3, $F(1, 482) = 0.19$, $p > 0.05$. In order to reduce missing data for these five variables, they were treated as time-invariant covariates in the analyses. As such, overall parent support, teacher support, peer support, educational expectations, and school engagement scores were calculated for each adolescent. The limitations of computing means for these contextual variables are considered in the [Discussion](#) section.

Academic competence

Academic competence was measured with two indicators: self-reported grades and self-perceived academic competence in Waves 1, 2, and 3 data collection. Self-reported grades were assessed by the question “What grades do you earn in school?” Possible responses could range from 1 = mostly As, to 8 = mostly below Ds on an eight-point Likert scale. Responses were recoded to correspond to the familiar GPA system, ranging from 0.5 = mostly below Ds to 4 = mostly As. Higher scores represented higher self-reported grades. Extant research suggests that self-reported grades are valid measures of academic competence, with the correlations between self-reported grades and official grades taken from school records ranging from 0.76 to 0.84 ([Bogensneider, 1997](#); [Dornbusch, Ritter, Leiderman, Roberts, & Fraleigh, 1987](#); [Paulson, 1996](#); [Steinberg, Lamborn, Dornbusch, & Darling, 1992](#)). As such, we used self-reported grades to approximate actual grades in this study.

Self-perceived academic competence was indexed by the academic competence subscale in the Self-Perception Profile for Children (SPPC, [Harter, 1983](#)). Participants are initially asked to choose between two types of people, for example, “Some kids do very well at their class work” or “Other kids don’t do very well at their class work.” After a participant chooses the person he or she is like, the participant then decides if it is “really true for me” or “sort of true for me.” Each item score could range from 1 to 4. The subscale score was the mean of the six item scores. Three of the six items were reverse coded so that higher subscale score reflected higher self-perceived academic competence. [Lerner et al. \(2005\)](#) report that the Cronbach’s alpha for this subscale = 0.72.

Procedure

Data collection occurred in the 4-H Study at about the same time of year across waves. School teachers or after-school program staff gave each youth an envelope to take home to his or her parent. The envelope contained a letter explaining the study, consent forms, a parent questionnaire, and a self-addressed envelope for returning the parent questionnaire.

The 4-H Study project staff or trained local assistants collected the data. Youth were tested as groups within their schools or program sites. Data collectors began by reading the instructions, and youth were instructed that they could skip any questions they did not wish to answer. Completing the Student Questionnaire took approximately two hours, which included one or two short breaks. Youth unable to be surveyed at their school or program site, in that they were either absent during the day of testing or the school superintendent did not allow testing to occur in the school in the second year, received a survey in the mail. In Wave 3, youth who were unable to be surveyed at their school or program site received an Internet link with a password in the mail, so they could fill out the Student Questionnaire online.

Results

Prior to conducting random coefficient hierarchical regression analyses to assess links between bullying and academic competence development within the longitudinal sample of 776 adolescents, preliminary data analysis was conducted in three steps. In Step 1, we described the demographic background of the longitudinal sample, such as sex, age, race/ethnicity, maternal education, and household per capita income. As the second step, we computed univariate descriptive statistics (means and standard deviations) for the outcome variables, including self-reported grades and self-perceived academic competence in Grades 5 through 7, and for the predictor variables, including maternal education and the selected contextual and individual variables; and we also computed Pearson product-moment correlations among the outcome variables and predictor variables. In Step 3, we calculated the overall distributions of bullying statuses in Grades 6 and 7 and the distributions by race/ethnicity; and we also compared the means of the outcome variables and predictor variables among different bullying statuses, using between-group fixed-effect univariate ANOVAs and post-hoc Tukey tests.

The key data analysis procedure used in this study to test the three key research questions was random coefficient hierarchical regression analysis for the longitudinal sample to construct individual growth models of academic competence. The purpose of such analysis is to capture the relationships between being a bully or being a victim, the selected contextual and individual variables, and academic competence within and across time ([Singer & Willett, 2003](#)). This approach also permitted the illustration, within the context of bullying, of the potential intra-individual changes and inter-individual differences in intra-individual changes in academic competence ([Baltes et al., 1988](#); [Cohen et al., 2003](#)). Studies suggest that there can be multiple trajectories for the development of academic competence displayed by youth over time, and researchers have increasingly recognized the importance of investigating such trajectories ([Jimerson et al., 1999](#); [Marston & Tindal, 1995](#)). Exploring these diverse trajectories is not only theoretically interesting but also has implications for tailoring intervention programs to promote academic competence for different adolescents.

“Time” was centered at Wave 2 (Grade 6). “Time” and bullying status dummy variables were entered into the regression models as level 1 (within-person) predictors. The other predictor variables, including sex, maternal education, parent support, teacher support, peer support, educational expectations, and school engagement, were treated as time-invariant variables, and entered into the regression model as level 2 (between-person) predictors.

Preliminary analyses

The mean age of the 776 adolescents in the longitudinal sample for this study was 12.05 years in Grade 6 ($SD = 0.52$ years). Among the 773 adolescents who had valid sex data, 467 (60.4%) were girls (mean age = 12.01 years, $SD = 0.54$ years), and 306 (39.6%) were boys (mean age = 12.12 years, $SD = 0.47$ years). Between-group, fixed-effect univariate ANOVAs suggested that boys were significantly older than girls, $F(1, 707) = 8.12, p < 0.01$. Of the 773 adolescents who provided information about race/ethnicity, 21 (2.7%) were Native American, 26 (3.4%) were Asian or Pacific Islanders, 42 (5.4%) were African American; 87 (11.3%) were Latino, 522 (67.5%) were European American, and 31 (4.0%) were multiracial/multiethnic, 4 (0.5%) reported "Other," and 40 (5.2%) changed racial/ethnic identity across Grade 5 through Grade 7. According to parents' reports, on average, the birth mother of these adolescents had 13.63 years of education ($SD = 2.39$ years), and the 10th percentile to the 90th percentile of maternal education ranged from 12 years to 16 years. The mean household per capita income was \$14,078 ($SD = \9373), and the 10th percentile to the 90th percentile of household per capita income ranged from \$3333 to \$25,000.

Table 1 summarizes the means and standard deviations of, and correlations among, the two indicators of academic competence, demographic variables, and selected contextual and individual variables. Pearson product–moment correlations showed that self-reported grades in Grades 5 through 7 and self-perceived academic competence in Grades 5 through 7 positively correlated with each other ($ps < 0.01$). All six indicators of academic competence were positively associated with the selected contextual and individual variables, including parent support, teacher support, peer support, educational expectations, and school engagement ($ps < 0.01$). Sex was positively correlated with Grade 6 self-reported grades, teacher support, peer support, educational expectations, and school engagement ($ps < 0.01$). In other words, girls tended to have higher Grade 6 self-reported grades, teacher support, peer support, educational expectations, and school engagement than boys; but girls and boys were indistinguishable in self-reported grades in Grades 5 and 7, self-perceived academic competence in Grades 5 through 7, maternal education, and parent support. Maternal education was only positively associated with Grade 6 self-perceived academic competence ($p < 0.05$). All five selected contextual and individual variables positively correlated with each other ($p < 0.01$).

Table 1

Means and standard deviations of and correlations between academic competence, demographic variables, and selected contextual and individual variables for 776 adolescents, 2002–2005.¹

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|--------------------------------|---------------|--------------|--------------|--------------|--------------|--------------|--------------|
| 1. Grade 5 grades | | 0.46 (330)** | 0.52 (353)** | 0.45 (315)** | 0.41 (356)** | 0.38 (335)** | 0.09 (364) |
| 2. Grade 5 academic competence | | | 0.38 (368)** | 0.42 (344)** | 0.33 (378)** | 0.40 (363)** | 0.07 (387) |
| 3. Grade 6 grades | | | | 0.53 (643)** | 0.64 (713)** | 0.42 (671)** | 0.12 (726)** |
| 4. Grade 6 academic competence | | | | | 0.47 (662)** | 0.57 (634)** | 0.03 (678) |
| 5. Grade 7 grades | | | | | | 0.53 (697)** | 0.06 (753) |
| 6. Grade 7 academic competence | | | | | | | – 0.06 (710) |
| 7. Sex (female = 1) | | | | | | | |
| 8. Maternal education | | | | | | | |
| 9. Parent support | | | | | | | |
| 10. Teacher support | | | | | | | |
| 11. Peer support | | | | | | | |
| 12. Educational expectations | | | | | | | |
| 13. School engagement | | | | | | | |
| Ranges for possible responses | 0.5–4 | 1–4 | 0.5–4 | 1–4 | 0.5–4 | 1–4 | 0, 1 |
| Means, standard deviations | 3.48, 0.61 | 3.05, 0.63 | 3.41, 0.63 | 3.08, 0.60 | 3.36, 0.72 | 3.03, 0.62 | 0.60, 0.49 |
| N | 366 | 388 | 729 | 679 | 756 | 713 | 773 |
| | 8 | 9 | 10 | 11 | 12 | 13 | |
| 1. Grade 5 grades | 0.06 (313) | 0.25 (366)** | 0.19 (366)** | 0.19 (366)** | 0.23 (366)** | 0.40 (366)** | |
| 2. Grade 5 academic competence | – 0.09 (322) | 0.28 (388)** | 0.21 (388)** | 0.25 (388)** | 0.28 (388)** | 0.32 (388)** | |
| 3. Grade 6 grades | – 0.07 (649) | 0.36 (728)** | 0.34 (728)** | 0.24 (729)** | 0.35 (728)** | 0.43 (727)** | |
| 4. Grade 6 academic competence | – 0.10 (601)* | 0.40 (679)** | 0.34 (678)** | 0.27 (679)** | 0.38 (678)** | 0.41 (678)** | |
| 5. Grade 7 grades | – 0.03 (669) | 0.38 (755)** | 0.32 (754)** | 0.28 (756)** | 0.38 (754)** | 0.47 (754)** | |
| 6. Grade 7 academic competence | 0.01 (628) | 0.38 (712)** | 0.33 (712)** | 0.24 (713)** | 0.31 (711)** | 0.38 (713)** | |
| 7. Sex (female = 1) | – 0.06 (688) | 0.06 (772) | 0.14 (771)** | 0.20 (773)** | 0.12 (771)** | 0.20 (771)** | |
| 8. Maternal education | | – 0.01 (687) | – 0.03 (686) | – 0.03 (688) | – 0.05 (686) | – 0.06 (686) | |
| 9. Parent support | | | 0.53 (773)** | 0.43 (775)** | 0.40 (773)** | 0.37 (773)** | |
| 10. Teacher support | | | | 0.40 (774)** | 0.31 (773)** | 0.37 (773)** | |
| 11. Peer support | | | | | 0.28 (774)** | 0.26 (774)** | |
| 12. Educational expectations | | | | | | 0.32 (772)** | |
| 13. School engagement | | | | | | | |
| Ranges for possible responses | 8–20 | 1–5 | 1–5 | 1–5 | 1–5 | 1–5 | |
| Means, standard deviations | 13.63, 2.39 | 3.66, 0.68 | 4.06, 0.57 | 4.23, 0.65 | 4.56, 0.62 | 4.12, 0.67 | |
| N | 688 | 775 | 774 | 776 | 774 | 774 | |

Note. ¹Correlations were computed using a pairwise procedure, and sample sizes ranged from 313 to 775 due to missing data. Numbers of valid cases are in parentheses.

* $p < .05$. ** $p < .01$.

All 776 adolescents had valid bullying status data. In Grade 6, 26 (3.4%) of them were categorized as bullies, 91 (11.7%) as victims, and 659 (84.9%) as comparison group members. In Grade 7, 29 (3.7%) were bullies, with 64 (8.2%) victims and 683 (88.0%) comparison group members. Chi-square analysis indicated that the distribution of bullying statuses in Grade 6 was not different from that in Grade 7, $\chi^2 = 5.30$, $df = 2$, $p > 0.05$. In addition, boys and girls were indistinguishable in the distribution of bullying statuses in Grade 6, $\chi^2 = 1.89$, $df = 2$, $p > 0.05$, or in Grade 7, $\chi^2 = 3.65$, $df = 2$, $p > 0.05$. In turn, between-group, fixed-effect univariate ANOVAs indicated variations in outcome and predictor variables across bullies, victims, and comparison group members. Maternal education and educational expectations were not significantly different for adolescents with different bullying statuses. However, Grade 6 self-reported grades, $F(2, 726) = 10.42$, $p < 0.001$, Grade 6 self-perceived academic competence, $F(2, 676) = 10.50$, $p < 0.001$, parent support, $F(2, 772) = 7.42$, $p < 0.001$, teacher support, $F(2, 771) = 4.26$, $p < 0.05$, peer support, $F(2, 773) = 6.42$, $p < 0.01$, and school engagement, $F(2, 771) = 15.04$, $p < 0.001$, varied significantly among adolescents with different bullying statuses. Post-hoc Tukey tests indicated that bullies' self-reported grades in Grade 6 and school engagement were lower than both victims and comparison group members. Bullies also had lower Grade 6 self-perceived academic competence and parent support than comparison group members. Victims reported less peer support than comparison group members.

As in Grade 6, maternal education was not significantly different for adolescents with different bullying statuses in Grade 7. However, Grade 7 self-reported grades, $F(2, 753) = 19.93$, $p < 0.001$, Grade 7 self-perceived academic competence, $F(2, 710) = 9.99$, $p < 0.001$, parent support, $F(2, 772) = 20.74$, $p < 0.001$, teacher support, $F(2, 771) = 6.64$, $p < 0.001$, peer support, $F(2, 773) = 11.32$, $p < 0.001$, educational expectations, $F(2, 771) = 6.67$, $p < 0.001$, and school engagement, $F(2, 771) = 12.79$, $p < 0.001$ varied significantly among adolescents with different bullying statuses in Grade 7. Post-hoc Tukey tests suggested that compared with victims and comparison group members, bullies had lower self-reported grades and self-perceived academic competence in Grade 7, as well as lower parent support and school engagement. Moreover, bullies scored lower on teacher support and educational expectations than comparison group members. As in Grade 6, victims reported lower peer support than comparison group members.

Random coefficient hierarchical regression analyses

The purpose of the random coefficient hierarchical regression analyses was to answer the three key research questions of this study: 1. To what extent, if at all, does being a bully or being a victim, account for an adolescent's academic competence above and beyond the influences of demographic background and prior years' academic competence?; 2. To what extent, if at all, do parent support, teacher support, peer support, educational expectations, and school engagement impact an adolescent's academic competence, controlling for demographic background, prior years' academic competence, and bullying status?; and 3. Do parent support, teacher support, peer support, educational expectations, and school engagement impact an adolescent's academic competence differently, depending on his or her bullying status?

A series of models was tested that included level 1 and level 2 variables and their interactions. To conserve journal space, two models will be described for each of the two outcome variables. The first includes the "main effects" of time, sex, SES, and the two bullying dummy variables. The second model adds contextual variables, individual variables, and significant interactions, as the most parsimonious model.

Self-reported grades as an outcome

Table 2 summarizes the taxonomy of the random coefficient hierarchical regression models that show the relationships between bullying status, the selected contextual and individual variables, and self-reported grades, controlling for prior years' self-reported grades and demographic background, including sex and maternal education. The regression analysis results provided estimates for the population from which the longitudinal sample of 776 adolescents was drawn.

Model 1 shows that girls had significantly higher grades than boys. Notably, self-reported grades did not change over time or vary by SES, once the other variables were controlled. Being a bully negatively predicted self-reported grades, while being a victim did not predict lower self-reported grades.

Model 2 provides a more nuanced view by including the contextual variables, individual variables, and significant interaction terms. The interaction between being a bully and time and the interaction between being a bully and sex were significant predictors of self-reported grades. In other words, with other predictors being equal, being a bully negatively impacted an average adolescent's self-reported grades over time, and being a bully was more detrimental for girls than for boys in predicting self-reported grades. Higher educational expectations and greater school engagement independently predicted better self-reported grades, with other predictors being equal. In order to depict the predictive effects of the interaction between teacher support and being a victim and interaction between peer support and being a victim, two prototypical plots were generated, while holding other predictors constant.¹ As shown in Fig. 1a, the upward slope of teacher support in predicting self-reported grades was steeper for the average victim than for the average adolescent in the comparison group. This finding indicated that, everything else being equal, the positive predictive effect of teacher support on self-reported grades was stronger for victims than for members of the comparison group.

¹ In Fig. 1a, Time = 0 (Grade 6), Sex = 0 (male), BullyD = 0 (not being a bully), SES = 13.63 (mean), ParentS = 3.66 (mean), PeerS = 4.23 (mean), EduExp = 4.56 (mean), and SchlEng = 4.11 (mean). In addition, Low Teacher Support = 3.28 (10th percentile) and High Teacher Support = 4.75 (90th percentile). In Fig. 1b, Time = 0 (Grade 6), Sex = 0 (male), BullyD = 0 (not being a bully), SES = 13.63 (mean), ParentS = 3.66 (mean), TeacherS = 4.06 (mean), EduExp = 4.56 (mean), and SchlEng = 4.11 (mean). In addition, Low Peer Support = 3.29 (10th percentile) and High Peer Support = 5.00 (90th percentile).

Table 2

Parameter estimates, approximate p values, and goodness-of-fit tests for a taxonomy of random coefficient regression models of the relationships between bullying status, the selected contextual and individual variables, and self-reported grades, controlling for demographic background and prior years' self-reported grades, for 776 adolescents, 2002–2005.

| Predictors | Models | |
|--|-----------|-----------|
| | M1 | M2 |
| Intercept | 3.43*** | 0.33 |
| Time | – 0.01 | – 0.01 |
| Sex | 0.13** | – 0.01 |
| SES | – 0.01 | – 0.003 |
| Bully (versus comparison) | – 0.46*** | 0.15 |
| Victim (versus comparison) | – 0.01 | – 0.23 |
| Bully* time | | – 0.40* |
| Victim* time | | 0.05 |
| Bully* sex | | – 0.43* |
| Victim* sex | | – 0.10 |
| Parent support | | 0.06 |
| Teacher support | | 0.05 |
| Peer support | | 0.11** |
| Educational expectations | | 0.22*** |
| School engagement | | 0.30*** |
| TeacherS* victim | | 0.25** |
| PeerS* victim | | – 0.17* |
| σ_e^2 | 0.1406*** | 0.1340*** |
| $T_{00} (\sigma_u^2)$ | 0.2895*** | 0.1711*** |
| $\tau_{22} [\text{var}(\text{Bully})]$ | 0.4193** | 0.2906* |
| # parameters | 10 | 21 |
| – 2LL | 2280.47 | 1953.81 |
| Δ – 2LL | 46.11*** | 310.41*** |
| Pseudo- R_c^2 | 0.10 | 0.04 |
| Pseudo- R_u^2 | – | 0.41 |

Note. SES = maternal education. ParentS = parent support. TeacherS = teacher support. PeerS = peer support. EduExp = educational expectations. SchlEng = school engagement.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Fig. 1b illustrates that for the average adolescent in the comparison group, higher peer support predicted higher self-reported grades; however, higher peer support predicted lower self-reported grades for the average victim. These results suggested that, higher peer support predicts higher self-reported grades for comparison group members but lower self-reported grades for victims, with other predictors being held constant.

The finding that peer support undermined self-reported grades for victims was contradictory to what was hypothesized. This unexpected finding prompted us to go beyond examining the strength of peer support and looked at the quality of peer support for victims versus comparison group members. We suspected that the quality of peer support for youth with different bullying statuses differs, because they have friends of different characteristics. The variable Friends' Influence serves an indicator of the friends' characteristics. Therefore, we looked at Friends' Influence among adolescents with different bullying statuses. Between-group, fixed-effect univariate ANOVAs suggested that friends' influences were different among bullies, victims, and comparison group members in both Grades 6 and 7, $F(2, 773) = 27.24, p < 0.001$; $F(2, 773) = 34.66, p < 0.001$. Post-hoc Tukey analyses indicated that, in both Grades 6 and 7, victims and comparison group members are indistinguishable in terms of the negative influences from friends, such as having close friends who smoke, drink, use drugs, get into trouble in school, and do badly in school ($ps > 0.015$). Apparently, the quality of peer support (friends' characteristics), as measured by Friends' Influence in the present study, did not help explain why peer support undermined self-reported grades for victims while enhanced self-reported grades for comparison group members. We discuss this matter in the Discussion section.

In sum of the regression analyses with self-reported grades as the outcome, compared with being in the comparison group, being a bully predicted lower self-reported grades over time; and being a bully was more detrimental for girls than for boys in predicting the level of self-reported grades. Educational expectations and school engagement independently and positively predicted the level of self-reported grades, irrespective of bullying status. In addition, teacher support positively predicted self-reported grades, and the effect was stronger for victims than for comparison group. Moreover, peer support predicted the level of self-reported grades positively for comparison group members but negatively for victims.

Self-perceived academic competence as an outcome

Table 3 summarizes the taxonomy of the random coefficient hierarchical regressions that show the relationships between bullying status, the selected contextual and individual variables, and self-perceived academic competence, controlling for prior years' self-perceived academic competence and demographic background, including sex and maternal education.

Model 1 showed a significant decrease over time in self-perceived academic competence, and well as significantly lower scores for both bullies and victims than for the comparison group. Being a victim predicted a score that was 0.16 points lower than for

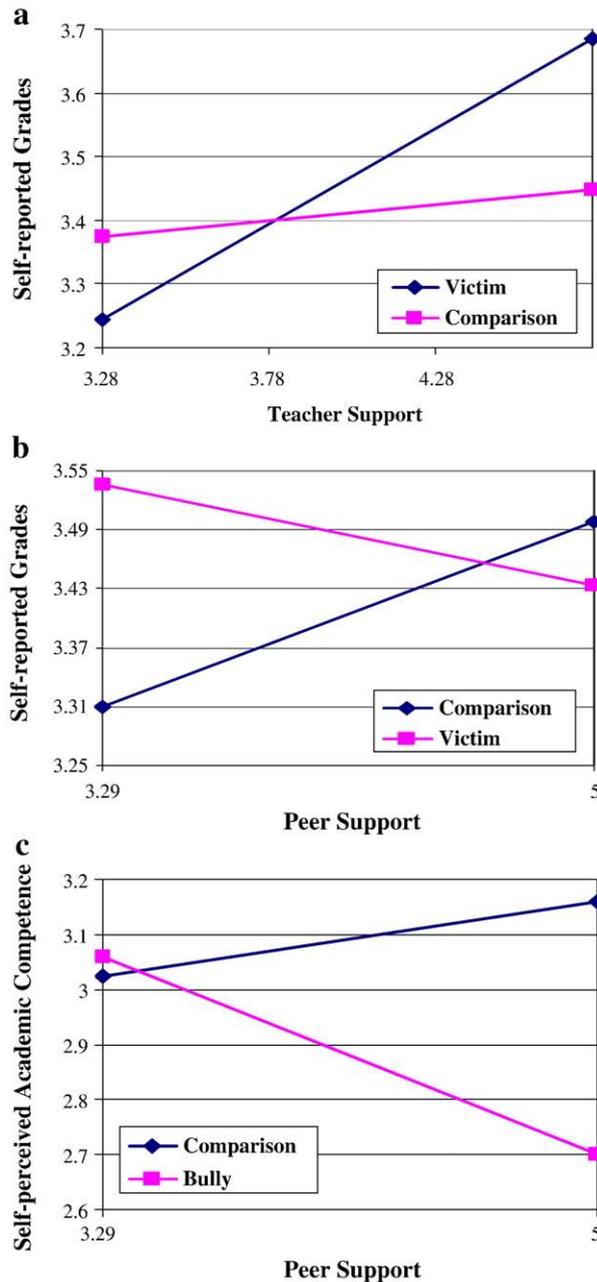


Fig. 1. Prototypical plot that shows the interaction between (a) teacher support and being a victim in predicting self-reported grades; (b) peer support and being a victim in predicting self-reported grades; and (c) peer support and being a bully in predicting self-perceived academic competence, for 776 adolescents, 2002–2005.

youth in the comparison group ($p < 0.01$); and bullies were 0.39 points lower than average youth in the comparison group ($p < 0.001$). Model 2 again provides a more differentiated view by including the selected contextual variables, individual variables, and significant interaction terms. Higher parent support and teacher support independently predicted better self-perceived academic competence, with other predictors being equal. In order to depict the predictive effects of the interaction between peer support and being a bully, a prototypical plot was generated, while holding other predictors constant.²

² In Fig. 1c, Time = 0 (Grade 6), Sex = 0 (male), VictimD = 0 (not being a victim), SES = 13.63 (mean), Parents = 3.66 (mean), TeacherS = 4.06 (mean), EduExp = 4.56 (mean), and SchlEng = 4.12 (mean). In addition, Low PeerS = 3.29 (10th percentile) and High PeerS = 5.00 (90th percentile).

Table 3

Parameter estimates, approximate *p* values, and goodness-of-fit tests for a taxonomy of random coefficient regression models of the relationships among bullying status, the selected contextual and individual variables, and self-perceived academic competence, controlling for demographic background and prior years' self-perceived academic competence, for 776 adolescents, 2002–2005.

| Predictors | Models | |
|--|-----------|-----------|
| | M1 | M2 |
| Intercept | 3.25*** | 2.42*** |
| Time | – 0.05* | – 0.05* |
| Sex | – 0.02 | – 0.15*** |
| SES | – 0.01 | – 0.01 |
| Bully (versus comparison) | – 0.39*** | 0.99* |
| Victim (versus comparison) | – 0.16** | – 0.09 |
| Parent support | | 0.15*** |
| Teacher support | | 0.09* |
| Peer support | | 0.08* |
| Educational expectations | | – 0.29 |
| School engagement | | – 0.30 |
| PeerS*bully | | – 0.29* |
| EduExp*SchlEng | | 0.11** |
| σ_e^2 | 0.1595*** | 0.1610*** |
| $\tau_{00} (\sigma_{\eta}^2)$ | 0.2042*** | 0.1084*** |
| $\tau_{22} [\text{var}(\text{Bully})]$ | 0.05 | – |
| # parameters | 10 | 15 |
| – 2LL | 2031.73 | 1769.61 |
| Δ – 2LL | 26.25*** | 262.12*** |
| Pseudo- R_c^2 | 0.02 | – |
| Pseudo- R_{η}^2 | – | 0.47 |

Note. SES = maternal education. ParentS = parent support. TeacherS = teacher support. PeerS = peer support. EduExp = educational expectations. SchlEng = school engagement.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Fig. 1c illustrates that for the average adolescent in the comparison group, greater peer support predicted higher self-perceive academic competence; however, greater peer support predicted lower self-perceived academic competence for the average bully. These results suggested that, peer support enhanced self-perceived academic competence for comparison group members but undermined self-perceived academic competence for bullies, with other predictors being held constant. The finding that peer support undermines self-perceived academic competence for bullies was contradictory to our hypothesis. As reported earlier, follow-up analyses showed that friends' influences were different among bullies, victims, and comparison group members in both Grades 6 and 7. Post-hoc Tukey analyses indicated that, in Grades 6 and 7, bullies had more negative influences from friends than members of the comparison group. In other words, bullies' friends were more likely to be engaged in problem behaviors, such as smoking cigarettes, drinking alcohol, using drugs, getting into trouble in school, and doing badly in school ($p < .001$).

For an average adolescent with high educational expectations, greater school engagement predicted higher self-perceived academic competence. However, for an average adolescent with low educational expectations, greater school engagement did not appear to contribute much to self-perceived academic competence. Everything else being equal, the higher the educational expectations, the stronger the positive relationship between school engagement and self-perceived academic competence.

In sum of the regression analyses with self-perceived academic competence as the outcome, both being a bully and being a victim negatively predicted the level of self-perceived academic competence, when demographic background variables and prior years' self-perceived academic competence were controlled for, but these predictive effects did not change over time or differ among girls versus boys. Parent support and teacher support independently and positively predicted the level of self-perceived academic competence, irrespective of bullying status. In addition, peer support predicted the level of self-perceived academic competence positively for comparison group members but negatively for bullies. Moreover, the positive relationship between school engagement and self-perceived academic competence was stronger for adolescents with high educational expectations than for those with low educational expectations. For both self-reported grades and self-perceived academic competence, we tested all possible 2-way interactions, and only those that were significant were included in Tables 2 and 3. In addition, all relevant higher-order interactions were tested and were not significant.

Discussion

Consistent with what may be derived from extant cross-sectional research on the relationships between bullying and academic competence (e.g., Nansel et al., 2001; Yang et al., 2003), this study suggested that, overall, being a bully and being a victim have negative developmental implications for academic competence. In addition, there are some nuanced differences in the findings for adolescents with different bullying statuses. As was shown in Table 2, being directly involved in bullying, as a bully or as a victim, explained a small but significant proportion (2%) of the within-person residual variance in self-perceived academic competence. With time, sex, and maternal education being held constant, both bullies and victims had significantly lower self-perceived academic competence than comparison group members. Such predictive effects did not change over time and were similar for boys

and girls and for adolescents with different levels of maternal education. On the other hand, being a bully accounted for 10% of the within-person residual variance in self-reported grades. Being a bully impaired self-reported grades over time, that is, the development of self-reported grades for the bullies was on a decreasing trajectory, while the comparison group's self-reported grades did not change over time, and being a victim did not lower self-reported grades.

The negative impact of being a bully on the level of self-reported grades was more pronounced for girls than for boys. What explains this interesting gender difference? One possible reason is that girls are less likely to bully peers (Eslea et al., 2004; Nansel et al., 2001; Pepler, Craig, & Connolly, 2006), and thus being a bully is more abnormal for a girl than for a boy, and a girl bully is more likely to be involved in other problem behaviors that distract her from academic work. Moreover, relational bullying is more common among girls than among boys (Crick & Grotpeter, 1995). Compared to physical bullying, which is more common among boys, it may take more time and intelligent space to plan and implement relational bullying and hence prevent a girl bully from focusing on her studies.

In this study, with either self-reported grades or self-perceived academic competence as indicator, bullies had lower academic competence than comparison group members, when demographic background and baseline academic competence development were held constant. Previous research provides an explanation for such findings. Adolescents who are bullies are more likely to be involved in other problem behaviors, such as substance use and serious violent behaviors (Andershed et al., 2001; Nansel et al., 2003), and they are more likely to participate in juvenile delinquency and gang activities (Holmes & Brandenburg-Ayres, 1998). As such, it is conceivable that the bullies are less likely to engage in learning activities, and therefore being a bully can weaken academic competence. Indeed, univariate data analyses in this study indicated that, in comparison with victims and comparison group members, bullies have lower school engagement. Given that school engagement plays a significant role in positively predicting academic competence, as suggested in this study and previous research (Li, 2007; Sirin & Rogers-Sirin, 2004), it is likely that bullies have lower academic competence than do adolescents in the comparison group. Alternatively, it is also possible that lower academic competence makes adolescents more likely to get involved in bullying peers, and hence trigger a "vicious cycle" over time. But the precise nature of such processes is not yet clear. Future research should elucidate the potential "vicious cycle" of bullying peers and lower academic competence.

Results from this study suggested that being a victim predicted lower self-perceived academic competence, compared with being in the comparison group, when demographic background variables and prior years' academic competence were held equal. However, being a victim did not predict lower self-reported grades. Research shows that being bullied predicts depressive symptoms and low self-esteem (e.g., Callaghan & Joseph, 1995; Smith et al., 1999). The victims' depressive symptoms and low self-esteem may be manifested in a variety of ways, including low self-perceived academic competence. In other words, victims may see themselves not as smart as their peers, even though their grades are not lower than their peers. Existing studies also show that victims are also more likely to have difficulties regulating attention and concentrating on tasks (Schwartz et al., 1998). Such difficulties can make it hard for victims to focus on their school work while trying to avoid being bullied. Moreover, victims feel stressed at school and tend to skip school to avoid being picked on (Dupper & Meyer-Adams, 2002; Hazler et al., 1991; Kochenderfer & Ladd, 1996; Yang et al., 2003). Nevertheless, as results in this study indicated, victims somehow can manage to do as well as comparison group members in grades, probably through extra efforts in regulating their attention and concentrating on their school work despite being regularly picked on. As such, there may be a legitimate reason for victims to believe that they are not as smart as others, because it takes them extraordinary efforts to do well in school work.

It is important to emphasize that the predictive effect of being a victim for self-perceived academic competence was less strong and less consistent, compared to the predictive effect of being a bully. By using self-reported grades and self-perceived academic competence as separate indicators of academic competence, instead of using only one indicator, as did earlier research (e.g., Nansel et al., 2001), this study offers some new insights into the impact of bullying on academic competence. Although these two indicators were positively correlated with each other, it could not be assumed that bullying would impact them in the same way. Self-reported grades index adolescents' assessment of how well they actually do in school work, while self-perceived academic competence reflects adolescents' perception of their academic capability or smartness (Harter, 1983). As evidence for the distinction between these two constructs, results in this study showed that girls tend to actually do better in grades than boys, but girls do not see themselves smarter than boys. By showing how bullying impacts both adolescents' assessments of how well they do in school work and perceptions of their academic capacity, this study provides richer information about the link between bullying and academic competence.

The present study expands our understanding about the relationships between bullying and academic competence by using longitudinal data and indicating that the negative impact of bullying on academic competence holds even when the predictive effects of demographic background and baseline academic competence development are controlled. In light of such findings and other studies about the negative implications of bullying on social and emotional development (Smith et al., 1999; Smith, 2004), as well as the prevalence of bullying (Nansel et al., 2001; Olweus, 1999), effective interventions are essential to prevent bullying from happening and to ameliorate its repercussions. Moreover, it would be useful for people who design and implement bullying interventions to address the issue of academic competence as part of the interventions, which is still more or less rarely a target of such work.

It should be noted that there are interindividual differences in the impact of being a bully on self-reported grades. As noted in Table 2, the estimated differential in self-reported grades between comparison group members and bullies varied among youth, as indicated by the statistically significant τ_{22} , that is, the unpredicted variability in the regression coefficient of being a bully. There are probably other factors that influence the link between being a bully and lower self-reported grades. Such factors may include type of bullying (e.g., physical, verbal, or relational), as well as intensity, frequency, and duration of bullying activities. Bullying is not a stable characteristic, but a dynamic, complex, and multiple-dimensional phenomenon (Mellor, 1999). Thus, it would be

useful to take variations and changes in the above-mentioned factors into account in future research about the impact of bullying on academic competence. For example, cluster analysis would be a useful method to profile adolescents along these factors. Comparing the developmental trajectories of academic competence among different clusters of adolescents would provide more nuanced information about how bullying impacts adolescents' academic development.

From a developmental systems theoretical perspective, every youth has the potential to develop positively, given adequate developmental assets in their lives (Lerner, 2002, 2004, 2005). Overall, findings in this study suggested that parent support, teacher support, educational expectations, and school engagement act as developmental assets for academic competence in the context of bullying. As hypothesized, greater parent support predicted higher self-perceived academic competence, and the predictive effect was similar for bullies, victims, and comparison group members. This finding echoes previous research (Kim & Rohner, 2002; Morrison et al., 2003). However, parent support was not a significant predictor of self-reported grades, which is similar to the finding from an earlier study using cross-sectional data derived from the 4-H Study (Ma et al., *in press*). One explanation is that, although parent support may enhance adolescents' self-perception of smartness, it may not necessarily improve their grades. Further research using other samples is needed to cross-validate these findings, and a combination of qualitative and quantitative methodologies would be particularly useful to provide in-depth information about the relationships between parent support and academic competence.

This study found that teacher support is a significant and positive predictor of both self-reported grades and self-perceived academic competence. Such findings are compatible with previous research that shows the positive influences of teacher support on academic competence (Chen, 2005; Rosenfeld, Richman & Bowen, 2000), although the prior research was not conducted in the context of bullying. In this study, greater teacher support independently predicted high self-perceived academic competence, and the predictive effect was not different for adolescents with different bullying statuses, being it a bully, victim, or comparison group member. Interestingly, teacher support interacted with being a victim in predicting self-reported grades: teacher support carried more weight for victims than for comparison group members. This finding has important implications for promoting academic success for adolescents who are bullied – a little more emotional support and discipline from teachers may make a big difference in the victims' academic outcome.

Findings in this study indicated that educational expectations and school engagement independently and positively predict self-reported grades. In addition, educational expectations and school engagement interacted in predicting self-perceived academic competence, that is, the positive relationship between school engagement and self-perceived academic competence was stronger for adolescents with greater educational expectations. As demonstrated in the effects of educational expectations and school engagement in fostering academic competence, adolescents are active agents in shaping their own lives (Lerner, 2002). Life-span developmental theory, a “member” of the developmental systems theory “family” (Lerner, 2002), offers useful insights on this phenomenon. Life-span developmental theory states that actions involved in human development include a process of three components: selection, optimization, and compensation, known as the SOC model (Freund & Baltes, 1998, 2000). Selection is oriented towards choosing domains of functioning, optimization is about ensuring the most gains in chosen domains, and compensation focuses on redressing losses. Adaptive selection, optimization, and compensation foretell successful development outcomes (Baltes & Baltes 1990; Baltes, Lindenberger, & Staudinger, 1998). In the case of academic competence, educational expectations embody selection, that is, choosing academic achievements as a major domain of functioning; and school engagement represents optimization, as it entails striving to make the best of educational experiences. As such, higher educational expectations and greater school engagement facilitate positive development of academic competence. Future research using more sophisticated methods, such as Structural Equation Modeling (SEM), should include the measures of the SOC model in analyses exploring how relationships between SOC and educational expectations and school engagement predict academic competence in the context of bullying.

In short, as hypothesized from a developmental systems theoretical perspective (Lerner, 2002), given enough developmental assets, it is possible for bullies and victims to be as academically successful as their peers in the comparison group. This study provides useful information about potential entry points for school bullying intervention programs that aim to enhance academic competence for bullies and victims. Future longitudinal research with more complex models that include both the developmental assets and risk factors, such as depression and problem behaviors, would help clarify how developmental assets may offset the influences of the risk factors in predicting academic competence for bullies and victims. Another line of useful research may include exploring what variables facilitate the presence of developmental assets. For example, it would be interesting to investigate if contextual variables, such as parents' educational expectations (Flouri, 2006), can be modified to foster adolescents' educational expectations and school engagement and hence promote academic competence in the context of school bullying.

Unexpectedly, peer support enhanced self-perceived academic competence for comparison group members but undermines self-perceived academic competence for bullies. In addition, peer support enhances self-reported grades for comparison group members but undermines self-reported grades for victims. These findings look counterintuitive and do not seem to be consistent with previous research, which indicates that peer support play a positive role in predicting academic competence for youth of similar age in the U.S. (Rosenfeld et al., 2000). Nevertheless, the seemingly inconsistency becomes understandable when we look more deeply into how the data were analyzed. The Rosenfeld et al. (2000) study focused on examining the influence of peer support on academic competence in its U.S national sample; in turn, in this study, we explored if peer support would work differently for adolescents with different bullying statuses, by comparing bullies and victims with comparison group members.

A specific interpretation of the findings about the interaction between peer support and being a bully comes from the univariate data analyses in this study. Fixed effects, between-group univariate ANOVAs showed that friends' influences for bullies are significantly more negative than that for the comparison group. The closest friends of bullies were more likely to be involved in

problem behaviors, including smoking cigarettes, drinking alcohol, using drugs, getting into trouble in school, and doing badly in school work. Other research also suggests that bullies are more likely to hang out with peers with problem behaviors (Holmes & Brandenburg-Ayres, 1998). Probably being influenced by such negative peer interactions, adolescents who bully are about four times more likely to report alcohol use and about seven times more likely to report drug abuse than their peers (Pepler, Craig, Connolly, & Henderson, 2001). Given that these involvements are distracting to school work, even though the bullies may see these friends as good friends, caring and trustworthy, the likelihood is that such peer support would negatively, rather than positively, impact one's academic competence.

We should note that such an interpretation does not explain why greater peer support impairs victims' self-reported grades. Actually, as suggested in the ANOVAs, victims were indistinguishable from the comparison group in terms of friends' negative influences, manifested as problem behaviors. Past research suggests that victims tend to have few friends (Olweus, 1999; Smith, 1999). It may be that the victims' friends, few as they are, also tend to be victims who suffer from depressive symptoms, along with other psychosocial difficulties (Callaghan & Joseph, 1995; Hodges et al., 1999; Hodges & Perry, 1999; Neary & Joseph, 1994; Rigby, 2000, 2001). "Hanging out" with such friends may be comforting in some way, but it may aggravate the victims' psychological maladjustment, which may mediate the experiences of being bullied and poor grades (Juvonen et al., 2000). These possibilities should be tested in future research that assesses the composition and quality of the peer group in more nuanced ways.

The findings about the negative impact of peer support for the academic competence of bullies and victims provide useful information for bullying interventions. As Pepler (2006) suggested, bullying interventions should take a binocular perspective, through providing supports for bullies and victims and, at the same time, creating social contexts that enhance positive interpersonal relationships and dissipate negative interactions. Pepler (2006) argued that such an approach can help the bullies and victims to move out of the abusive interactions of bullying. It is also reasonable to expect this approach in bullying interventions to facilitate the bullies' and victims' academic competence by dissipating negative friends' influences, as well as by providing parent support and teacher support.

Overall, there are multiple variables influencing the academic competence of adolescents who are bullies and victims in a complicated way, and these variables may present themselves in different configurations in different adolescents. As such, it is reasonable to expect diverse developmental trajectories for academic competence among adolescents with different bullying statuses, contextual influences, and individual characteristics. Bullying interventions that aim to effectively address the issue of academic competence should take the multiple salient influencing variables into consideration, and tailor interventions to meet different adolescents' needs. For instance, providing teacher support may be particularly important in promoting the academic competence of adolescents who are bullied; and transforming peer influences may be crucial for both adolescents who bully and adolescents who are bullied.

Future research may profit also by addressing the limitations of the present study. This study followed the "two or three times a month" cutoff point suggested by Solberg and Olweus (2003) in defining if an adolescent bullied a peer or was bullied by peers. Although this method was also used by other large scale bullying studies (Nansel et al., 2001; Olweus, 1999), it is not perfect. This method categorizes adolescents who bully peers or who are bullied by peers "only once or twice" in the past couple of months as a comparison group, while, theoretically, a comparison group member is someone who does not bully peers and is not bullied by peers (Smith & Morita, 1999). In addition, the 4-H Study uses a diverse but non-random sample, and there was attrition in creating the study's longitudinal sample with valid bullying status data. As a result, the longitudinal sample in this study may be skewed, for example, in regard to the representativeness of adolescents at the lower end of the bullying prevalence distribution. Another possibility is that adolescents in this study underreported their involvement in bullying due to social desirability. As such, the generalizability of the study findings should be interpreted with these cautions in mind. Another limitation is that the selected contextual and individual variables were treated as time-invariant (level 2, between-person) predictors in the random coefficient regression analyses. This approach was based on the assumption that these contextual and individual variables did not change in Grades 5 through 7, which was the case for maternal education and school engagement. This time-invariant assumption helped reduce missing data and increase power of statistical analysis, but readers should take this limitation into consideration when interpreting the findings. Moreover, this study did not examine the potential mediators (e.g., depression, delinquency, poor concentration) that can help explain how bullying may influence academic competence.

Despite its limitations, the present study extends previous work by indicating that the negative impact of bullying on academic competence is retained even when the influences of demographic background and the baseline of academic competence development are taken into account. Findings from this study provide yet another reason to actively prevent school bullying from happening and to ameliorate its repercussions. Moreover, this study highlights the utility of capitalizing on developmental assets, such as parent support, teacher support, educational expectations, and school engagement, in promoting academic competence among adolescents who bully and who are bullied.

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