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A longitudinal study of bullying, dominance, and victimization during the transition from primary school through secondary school

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Bullying and victimization were studied from a longitudinal, multi-method, multi-agent perspective as youngsters made the transition from primary through middle school. Generally, bullying and aggression increased with the transition to middle school and then declined. Bullying mediated youngsters' dominance status during the transition. Bullying may be one way in which young adolescents manage peer and dominance relationships as they make the transition into new social groups. Victimization declined from primary to secondary school. Correspondingly, youngsters' peer affiliations decreased, initially with the transition, and then recovered. Victimization, however, was buffered by peer affiliation, especially like most nominations relative to friendship nominations, during this time. Additionally, and consistent with the idea that bullying is used for dominance displays, cross-sex comparisons of aggressive bouts indicated that boys targeted other boys and did not target girls. Results are discussed in terms of the changing functions of aggression during adolescence.

Aggression and antisocial behaviour in American and European schools are persistent and very visible problems, particularly as youngsters make the transition from childhood and primary school to adolescence and secondary school (National Center for Educational Statistics, 1995). Much of the aggression in schools during this period involves individuals 'bullying' their peers (Coie & Dodge, 1998; Perry, Willard, & Perry, 1990). Bullying, which is more frequent among boys than girls, is characterized by youngsters purposefully 'victimizing' their peers by repeatedly using negative actions, such as physical, verbal, or indirect aggression (Boulton & Smith, 1994; Olweus, 1993a; Schwartz, Dodge, & Coie, 1993; Smith & Sharp, 1994). Bullying is also typified by a power differential where aggressors are more dominant than the targets (Olweus, 1993a,b). Most of the work on bullying and victimization, however, has been

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conducted with primary school children, has relied primarily on single measure (most questionnaires), single informant methodology, and has not been longitudinal in design. In light of these limitations, the intent of the current study was to examine the incidence and endorsement of bullying and victimization as boys and girls made the transition from primary school and childhood to secondary school and adolescence.

Bullying, dominance, and victimization during the transition from primary to secondary school

Bullying, proactive aggression, and dominance

Bullying is defined as a specific form of aggression, one that is used deliberately to secure resources. In this regard, it is a dimension of proactive aggression and distinct from aggression that is used reactively, or aggression that is used in response to social provocation (Dodge & Coie, 1987).

The period of early adolescence is important for the study of bullying and victimization, because during this period, relative to earlier periods in development, aggression is viewed less negatively by peers (Bukowski, Sippola, & Newcomb, 2000; Graham & Juvonen, 1998; Moffitt, 1993; Pellegrini, Bartini, & Brooks, 1999). This view may reflect young adolescents' casual associations with bullies because they represent challenges to adult roles and values (Moffitt, 1993). Adolescence is a time when youngsters challenge adult roles and values as they search and construct their own identity.

Correspondingly, and probably exacerbating the problem, this period also witnesses a series of abrupt changes in youngsters' social lives. First, adolescence is characterized by rapid body changes. The hormonal changes associated with increased body size also relate to the onset of sexual maturity, resulting in youngsters' increased interests in heterosexual relationships (e.g. Connolly, Goldberg, Pepler, & Craig, 1999). Such a rapid change in body size leads to the reorganization of youngsters', but especially boys', social dominance hierarchies (Hawley, 1999; Pellegrini & Bartini, 2001). Bigger and stronger boys become more dominant than their smaller peers. Boys' dominance status, in turn, is related to their attractiveness with girls (Pellegrini & Bartini, 2001).

Second, because youngsters also move from typically small, personal primary schools with well-established social groups into larger, less supportive secondary schools, means that youngsters have to re-establish social relationships during a time when peer relations are particularly important (Eccles, Wigfield, & Schiefele, 1998). During such transitions, aggression is often used in the service of establishing status with peers, in the form of dominance relationships (Strayer & Noel, 1986). From this view, bullying is viewed as a deliberate strategy used to attain dominance as youngsters enter a new social group.

Dominance is defined as a relationship variable that orders individuals in terms of their access to resources (Dunbar, 1988). Dominance status is achieved as a result of a series of agonistic and reconciliation interchanges between individuals (deWaal, 1986; Pellegrini & Bartini, 2001; Strayer, 1980). Individuals who are able to use agonistic, among other, strategies effectively should be dominant and have favoured access to resources (Hawley, 1999; Hawley & Little, 1999). Dominance relationships must be re-negotiated as youngsters move from primary school to middle school, when new social groupings are being formed.

In the initial stages of group formation, agonistic strategies, such as bullying, tend to

be used, followed by more cooperative and reconciliatory strategies (Pellegrini & Bartini, 2001). That the transition to middle school witnesses initial increases in bullying, in the more general context of age-related decline of bullying (Smith, Madsen, & Moody, 1999), is consistent with this view. After the initial transition and accompanying rise in bullying, rates of bullying should decrease. This decrease reflects re-established dominance relationships. Dominance hierarchies, when they are stabilized, serve the important function of reducing group aggression (Dunbar, 1982; Hawley, 1999; Vaughn, 1999).

This view of bullying as a way of establishing dominance leads to the prediction that bullying should increase with the initial transition from primary to secondary school, and then decrease. Similarly, proactive aggression, like bullying (Dodge & Coie, 1987), is used deliberately to attain some resource. Consequently, proactive aggression should follow a developmental course during this period similar to that of bullying.

These trends, however, should be qualified by gender differences. In keeping with extant work with younger children (e.g. Boulton & Smith, 1994), proactive aggression and bullying should be more frequent among boys than girls. Indeed, boys use and endorse aggression with other boys to establish and maintain dominance (Maccoby, 1998). Correspondingly, we posit that girls' attitudes towards bullying will be more negative than those of boys (Crick & Werner, 1998; Maccoby, 1998).

As noted above, dominance theory suggests that status is usually renegotiated as individuals experience rapid changes in body size and as they make the transition from one social group to another. At the end of primary school, youngsters are the biggest and strongest in their schools, but when they move into secondary school, they are suddenly the smallest and the weakest; thus, we predict that their dominance status will drop with the initial transition to secondary school and then rise as they progress through middle school.

Relatedly, we predict that bullying will mediate dominance during the transition from primary to secondary school. This prediction is based on the proposition that bullying is a form of aggression used by individuals to achieve some end, in this case dominance status (Pellegrini & Bartini, 2001; Sutton, Smith, & Swettenham, 1999). The mediational hypothesis predicts continuity in dominance status from primary school to secondary school and a relation between dominance at each of these points and bullying at the start of secondary school. A mediational hypothesis is supported, following Baron and Kenny (1986), when the preceding relations are significant and when the relation between dominance in primary school and dominance in secondary school is reduced to non-significance when the following paths are controlled statistically: between dominance in primary school and bullying at the start of secondary school and between bullying at the start of middle school and dominance secondary school.

Victimization

We will also chart the developmental course of victimization during this transitional period from childhood and primary school to adolescence and middle school. Extant research has documented declines in victimization with age (Smith, Shu, & Madsen, 2001). This decline seems to be due to youngsters' developing a repertoire of coping skills, such as ignoring bullying and retaliating, to stave off harassment as they get older (Smith *et al.*, 2001).

In the present study, we extend this earlier research on victimization in two ways. First, we examine victimization in the specific context of adolescence. Adolescence is

marked by youngsters' increased interest in heterosexual relationships (e.g. Connolly *et al.*, 1999), and it has been suggested that boys who are bullies will victimize girls (Craig, Pepler, Connolly, & Henderson, 2001). The problem of cross-sex aggression, but especially male-on-female aggression, is exacerbated by the finding that adolescent girls find aggressive boys attractive (Bukowski, Sippola, & Newcomb, 2000; Pellegrini & Bartini, 2001).

The observed relation between same and opposite sex victimization, however, may be a methodological artifact as both types of victimization were measured with self-reports (Craig *et al.*, 2001). In the present study, we will document cross-sex aggression through direct observations of peer interactions across the school day for 2 years, thus minimizing measurement bias. We document the extent to which boys and girls aggress against peers of the same and opposite sex. In this way, we eliminate the possibility that the relations documented in the earlier research were due to shared method variance or over-estimation of victimization that sometimes characterizes self-reports (Graham & Juvonen, 1998).

Broader concerns with methodological problems used to document victimization are also being voiced (e.g. Graham & Juvonen, 1998; Juvonen, Nishina, & Graham, 2001; Ladd & Ladd, 2001). The second way in which we advance the research on victimization addresses these larger methodological concerns. In the present study, we used a multi-method, multi-informant methodology to define both victimization and bullying. In particular, we utilized direct observational and diary methods, as well as peer nominations and self-reports, to sample victimization and bullying, across full school days for 2 years. To our knowledge such a multi-method approach, especially using direct observational data, has not been utilized before. While direct observations have been used, they have been limited to younger children's behaviour on the school playground at recess (e.g. Boulton, 1995). Direct observations are particularly important complements to other measures as they provide objective accounts of youngsters' behaviour in public places. Furthermore, our use of diaries kept by students, which are valid indicators of both constructs (Pellegrini & Bartini, 2000), allowed us to sample their experiences in the less public venues, such as toilets and locker rooms, where victimization often occurs (Astor, Meyer, & Behre, 1999).

This multi-method approach is a methodological advance, because single measures, such as self-reports or peer nominations, have dominated the field. Reliance on single measures to define any construct, victimization and bullying included, results in questionable construct validity (Cronbach, 1971; Cronbach & Meehl, 1955). Relatedly, using single informants as bases for both predictor and criterion variables threatens criterion-related validity to the extent that shared method variance may be responsible for documented relations. The result, of course, is increased Type I error.

Changes in peer affiliation between primary and secondary school and victimization

We also describe youngsters' peer affiliation as they make the transition from primary to secondary school. Peer affiliation is relevant to the study of victimization because, like bullying, it takes place in the context of the peer group. Recent research suggests that dimensions of peer affiliation, such as having friends and being liked by peers, buffers victimization (Hodges & Perry, 1999; Pellegrini *et al.*, 1999).

Friends buffer victimization, as demonstrated by the programmatic work of Perry and Hodges (Hodges, Malone, & Perry, 1997; Hodges & Perry, 1999) and others (Pellegrini *et al.*, 1999; Slee & Rigby, 1993). Generally, it was found that both the number and

quality of friends served to protect individuals from victimization.

Additionally, being liked by a number of peers also seems to buffer victimization. Specifically, Pellegrini and colleagues (Pellegrini *et al.*, 1999) found that the number of like-most nominations was negatively related to victimization and accounted for variance beyond that of reciprocal friend nominations. Pellegrini and colleagues argued that the number of like-most nominations may protect against bullying because peers represent possible social sanctions or retaliation against bullies. That bullies are concerned with social status among their peers would suggest that they would not target peers with allies or other social affiliations. These conclusions are limited, however, by the contemporaneous research design of this earlier research.

In the present study, we tested the relative predictive power of the number of reciprocal friends and number of like-most nominations as protective factors from victimization. This approach enables us to compare the relative efficacy of two separate, but related, dimensions of peer affiliation: a close dyadic relation and a group level measure of peer acceptance. This distinction is in keeping with the argument made by Bukowski and Hoza (1989) that the two should be treated as separate constructs.

The longitudinal design of this project enabled us to test the relative power of each construct to inhibit victimization. We predict, based on earlier research (Hodges & Perry, 1999; Pellegrini *et al.*, 1999) that both the number of reciprocal friendships as well as the number of like most nominations one receives should relate negatively to victimization. However, based on earlier contemporaneous research (Pellegrini *et al.*, 1999), we posit that like-most nominations should be the more important of the two. Simply, being liked by a number of peers should moderate the stability of victimization, possibly because of resulting social disapproval for a large number of peers at a time when peer acceptance and status are especially important.

In short, we will document age-related changes in bullying and victimization during the period when youngsters make the transition from primary to middle school. Guided by dominance theory, we posit that bullying will increase with the transition to middle school and then decline. From this view, we posit that bullying will mediate dominance during this transition. Victimization, too, should decrease across this period. As part of this description, the extent to which boys target girls in aggression will also be documented through direct observation. Extant research suggests that there should be continuity here, but these findings are limited and need to be replicated. Ethological theory, however, predicts that boys at this period in development should be bullying other boys, not girls, as this is a way in which they establish and maintain status with other boys (Chance, 1978).

Method

Participants

The participants in this study were sampled from the total 5th grade (the final year of primary school) population in a rural school system in North America. Though rural, parts of the county also served as bedroom communities for a large urban area. The five primary schools sampled all fed into two middle schools. The schools were predominantly European American (95%) with the remainder comprising African Americans and even fewer Asian Americans. The schools, though having a mixed

socioeconomic base ranging from professional classes (physicians, lawyers, etc.) to unemployed, were predominantly middle class. Youngsters were told that in return for participation, they would be paid; they were paid \$15 during the first year and \$20 during the second and third years. All participating teachers were paid \$50 per year.

For 5th grade, we had informed consent from 154 (87 males and 67 females), with a mean age of 11.9 years. In the 6th grade (the first year of middle school), students moved to one of two middle schools (grades 6–8), and we retained 90% of the sample ($N = 138$: 77 males and 61 females, with a mean age of 12.8 years at the start of the school year) from the preceding year. In the 7th grade, the sample was 129 (70 males and 59 females) or 93% of the year 2 sample and 83% of the year 1 sample, and had a mean age of 14.01 years.

Procedure

A schedule of the data collection across the 3 years of this study is presented in Table 1.

Table 1. Schedule of data collection across three years

5th grade	6th grade	7th grade
Self-report	Self-report	Self-report
Bullying	Bullying	Bullying
Victimization	Victimization	Victimization
Bullying attitude	Bullying attitude	Bullying attitude
Peer nominations	Peer nominations	Peer nominations
Like-most	Like-most	Like-most
Friendship	Friendship	Friendship
Teacher measures	Victimization	Victimization
Proactive aggression	Bullying	Bullying
Dominance	Direct observations	Direct observations
	Bullying/aggression	Bully/aggression
	Victimization	Victimization
	Cooperation	Cooperation
	Diary	Diary
	Bullying/aggression	Bully/aggression
	Victimization	Victimization
	Teacher measures	Teacher measures
	Proactive aggression	Proactive aggression
	Dominance	Dominance

Fifth grade

Fifth grade data were collected from both students and teachers.

Student data

Youngsters were assembled, by classroom, into central meeting rooms, such as libraries or spare classrooms. They were seated so that they were not in close proximity to peers, and a battery of instruments was administered by research associates and the first

author; the order of administration was counter-balanced across classrooms and schools. Administrations ran from February to March of the 5th grade.

Self-report and peer nomination measures were administered to each child: Olweus' (1989a) Senior Bully Victim Questionnaire (a self-report measure) and peer nominations of popularity and friendship. For all measures, items were read aloud by the member of the research team, and students' progress was monitored. Youngsters were also reminded not to look at peers' papers. We stressed that this information was confidential and that it would not be shared with anyone. On all measures, youngsters put their names on cover sheets so that we could trace their identity (through assigned codes which replaced names) across measures.

From the Olweus (1989a) Senior Bully Victim Questionnaire, scores for bullying (6 items, e.g. 'How often have you taken part in bullying other students in school?'), victimization (9 items for both direct and indirect exposure to victimization, e.g. 'Have you been bullied by one or several students?'), and negative attitude towards bullying (3 items, e.g. 'How do you usually feel when you see a student being bullied at school?') were derived, following procedures recommended by Olweus. Each item had a response choice ranging from 0 to 4. The unit of analysis was the average score/item.

This instrument has been used extensively and has strong psychometric properties (see Olweus, 1993a,b). It has been used with almost 25% of the whole population of 8- to 16-year-old Norwegian school children (Olweus, 1993b). Furthermore, it has both concurrent validity, e.g. it correlates significantly with peer nomination measures of bullying and victimization (Olweus, 1989b) as well as predictive validity, e.g. the victimization scale predicts internalizing disorders (Olweus, 1993b). The Cronbach alphas for the subscales in this study were: bullying, .76, victimization, .78, and negative attitude towards bullying, .66.

For the peer nomination procedures, youngsters were provided with a roster of their classmates and asked, among other things, to nominate three peers they liked most and children who were their friends; scores ranged from 0 to 3. As part of this procedure, they were also asked to nominate their friends; friends were defined as youngsters who nominated each other.

Teacher data

Also, during February of 5th grade, teachers were asked to complete for each participant Dodge and Coie's (1987) Teacher Check List. Youngsters were rated, on a 1-7 scale, for constructs related to social competence. The unit of analysis was the average score/item within each subscale. We utilized the following subscales: Aggression/Proactive (composed of 3 items, e.g. Bullies to get his/her way, Incites others), with a .93 alpha; Dominance (composed of 6 items, e.g. Wants to be in charge, Shows off, Egotistical), with a .88 alpha.

Sixth and seventh grades

Sixth grade measures included direct observational and diary measures, as well as peer nominations, self-report measures, and students' behaviours rated by teachers.

Direct observations

In the course of the school year (which began in August of Year 2 and ran through June of Year 3 of this study), focal participants were observed directly at least once a week for the whole school year. Observations took place across the school day and at various

locations. Morning observations took place in the hallways and in the cafeteria as youngsters waited to be admitted to their home rooms. In the late morning and early afternoon, observations were conducted in the halls and in the cafeteria. Additionally in the late afternoon, observations were conducted in the hallways and during their 'free time' (sometimes occurring outdoors), which lasted 15–30 min. The specific details of the observational procedures follow.

Before the school year began, seven research associates attended training sessions. The initial weeks of training involved familiarization with the observation coding sheets and discussion of terms. Next, observations were made, using the coding sheet, on videotaped episodes of youngsters' playground behaviour. Aggression was defined in terms of physical description (where one child hit, kicked, pushed, threatened, or insulted another), negative affect (e.g. frown, cry), and consequence (where the participants do not remain together after the aggressive act). Victimization was defined as a youngster being the target of either physical or verbal aggression and responding submissively (e.g. no retaliation, crying). Cooperation was defined as any behaviour (excluding aggression) where the focal child was interacting with a peer, either as initiator or as target. Non-social behaviour was defined as any behaviour where the focal children was not interacting socially with a peer, though they could have been engaged in a task, such as reading, or activity, such as shooting baskets, alone. In addition to coding the behaviours *per se*, the initiator and target of each behaviour were also coded. Individual kappas were computed at the end of this week on training tapes, and they were all well above .80, which is considered good (Pellegrini, 1996).

Training observations were conducted in the schools themselves. During the first weeks of school, research associates took individual photographs of students, which were then used to aid in the identification of focal children. Research associates also observed informally (*ad libitum* sampling, Pellegrini, 1996) in the school (mostly in the cafeteria at lunch time), so that they and the participants habituated to each other. During the next 2 weeks, each research assistant conducted focal child samples and continuous recordings (Pellegrini, 1996). At the end of this period, kappas were recalculated between each of the seven observers and a checker, and they remained over .80. After this training period, observations to be used in the data analyses began. Research associates received counter-balanced lists of focal children to observe for each academic quarter; they observed a different set of focal children each quarter. For alternative months, across the school year, observers were retrained (on videotapes) or were checked for reliability.

Focal child sampling/continuous recording rules were utilized (Pellegrini, 1996), yielding information on frequency of aggression, being the target of aggression, cooperation, and solitary behavior, as well as the identity of aggressors and victims. Each observer had a counterbalanced list of 17–20 focal participants to be observed. Focal children were observed for 3-min sampling intervals (marked by a beep using the 'count down' function on Timex Ironman Triathlon watches), and the behaviour of the focal child was recorded continuously, on a check sheet. If focal children 'disappeared' during this period (e.g. to go into the toilet) for 30 s, or more the observation was terminated, and the time was noted; the research associate then moved on to the next focal child.

Aggression and the target of aggression (victims) were coded, as part of a larger observation schedule. For aggression, the targets of these behaviours were also identified, and the target's behaviour was coded as well. Victimization scores were derived from the target data. When the 3-min sampling interval was complete, as

marked by the watch beep, the research associate moved down the counter-balanced list; in cases of absences, the next available focal child on the list was observed.

Direct observational data for 6th and 7th grades were divided into two equal 5-month periods: Time 1 and Time 2. The choice of dividing each year in halves was based on the following. We wanted some metric of change but one with an equal number of valid data points. Dividing the year into halves, rather than quarters, allowed the observational data from 5, rather than 2.5, months to be aggregated. Aggregation across a number of data points seemed particularly important in our observing aggression, which occurs relatively infrequently. Scores for individual categories were expressed as relative scores (relative to total number of observations/session). That is, instances of aggression indicated the number of cases observed per month/half year (scores ranging from 0 to 5).

Research associates were given a different cohort of focal youngsters to observe every 10 weeks to minimize their becoming too familiar with each other. By the end of each school year, each research associate had observed all participants in a school. Each focal child was observed at least once a week across the whole school year, for a minimum of 36 times.

Diaries

Youngsters were asked to keep a diary once a month for the whole school year. The aim of the diary was to collect information on children's experiences during the school day and at home, which would be difficult for us to observe directly. For purposes of this study, only data from the school day were used.

Diaries were administered to groups of youngsters once per month by a research associate, and youngsters were asked to recount experiences in the last 24 h. They were asked general questions about with whom and where they spent their time and more specific questions about being an aggressor ('Did you tease or hit anyone? Who?') and asked about being a target of aggression ('Did anyone hit or tease you? Who?'). We also asked how this was done and provided a list of standardized responses from which to choose (e.g. slapped, kicked, pushed, called a name). Participants were given five spaces to provide examples of aggression. It was assumed that all entries made under the aggression category were aggressive and were coded as such, and thus no inter-rater checks were made.

Like the direct observations, diary data were divided into two equal parts of 5 months each: Time 1 and Time 2 and the relative frequencies reported reflect affirmative answers to the diary question, 'Did you tease or hit anyone?' Scores ranged from 0 to 5 for each month/half year.

Teacher questionnaire

As with the 5th grade data, we had youngsters' 6th and 7th grade home room teachers completing Dodge and Coie's Teacher Checklist; this was done during the late autumn/winter of each year. We utilized the same three factors during the 6th and 7th grades as in the 5th. That different teachers in different schools completed these forms adds to their generalizability.

Peer nomination and self-report measures

All peer nomination and self-report measures were group administered during the fall and spring of each school year by trained research associates. Research associates did not administer measures to those subjects that they had previously observed, thus

minimizing any possible tester bias.

For the peer nomination measures, youngsters were assembled and given a roster of individuals in their home rooms. As in the 5th grade, youngsters were asked to nominate three peers they like most and their friends. Additionally, we asked them to nominate bullies and victims, following Schwartz *et al.*'s (1993) procedure where research associates asked youngsters questions aimed at nominating three aggressive youngsters and three youngsters who were targets of aggression, or victims. Aggressive questions included: 'Name kids who: Start fights, Say mean things, and Get mad easily'. The victimization questions included: 'Name kids who: Get picked on, Get teased, and Get hit and pushed'.

The self-report measure utilized was Olweus' (1989a) Senior Bully Victim Questionnaire. We used the same factors as those used during the 5th grade.

Results

Changes in proactive aggression, bullying, and dominance from primary to secondary school

In this objective, we first present descriptive information on the extent to which boys' and girls' proactive aggression, bullying, attitude towards bullying, and dominance changed as they progressed from primary to secondary school. Additionally, we tested the hypothesis that bullying at the start of 7th grade (the second year of middle school) mediated the continuity of dominance from 5th through 7th grade. The descriptive statistics for these analyses are displayed in Tables 2–4.

Table 2. Descriptive statistics of measures for 5th grade by gender

	Self-report				Peer nominations		Teacher measures	
	Bully	Victim	Neg Att	LM	Friends	Isolates	ProAg	Dom
5th grade								
Boy								
M	.79	1.52	1.27	.09	.03	2.80	2.07	2.76
SD	.59	.73	.67	.05	.02	2.15	1.42	1.50
Girl								
M	.50	1.44	1.65	.08	.03	2.89	3.57	2.60
SD	.58	.64	.69	.06	1.02	1.56	1.56	1.41

Note. NegAtt = negative attitude towards bullying; LM = like most; ProAgg = proactive aggression; Dom = dominance.

Analyses for the descriptive analyses are presented at two levels. For analyses of changes from 5th through 7th grades, a single indicator for each construct was used: Olweus' self-report measure of bullying and attitude toward bullying were taken at the end of 5th grade and twice a year during 6th and 7th grades. The proactive aggression and dominance measures were based on teacher questionnaires completed once during each of the 3 years.

For analyses of 6th and 7th grade data, the bullying and victimization constructs were defined in terms of an aggregate of multiple measures from different informants; this approach maximizes construct validity (Cronbach, 1971; Cronbach & Meehl, 1955;

Table 3. Descriptive statistics of 6th grade measures by gender

	Self-report			Aggregate			Teacher ratings		
	Bully	Victim	NegAtt	Bully	Victim	Affiliation	Isolation	Dom	ProAg
Autumn									
Boy									
M	.93	1.69	.91	5.25	4.57	3.96	12.33	2.36	2.07
SD	.92	1.16	.73	3.59	2.73	2.24	6.99	.99	1.36
Girl									
M	.65	2.05	1.18	3.52	4.15	4.32	10.60	2.11	1.52
SD	.61	1.31	.61	2.16	3.19	2.06	6.56	.9	.7
Spring									
Boy									
M	.90	1.56	.80	6.77	5.96	3.68	15.01		
SD	.72	.90	.68	4.34	3.70	2.10	11.37		
Girl									
M	.64	2.00	1.16	3.76	3.88	4.04	11.75		
SD	.75	1.01	.66	3.34	3.12	1.81	9.56		

Note. NegAtt = negative attitude towards bullying; Dom = dominance; ProAg = proactive aggression.

Table 4. Descriptive statistics of aggregate measures and teacher ratings for 7th grade by gender

	Self-report			Aggregate			Teacher ratings		
	Bully	Victim	NegAtt	Bully	Victim	Affiliation	Isolation	Dom	ProAg
Autumn									
Boy									
M	.84	1.45	.64	4.21	3.70	3.79	9.71	2.62	1.85
SD	.62	.72	.59	2.19	2.35	2.31	6.80	1.48	1.34
Girl									
M	.53	1.51	1.14	3.87	2.66	3.56	8.06	1.95	1.41
SD	.38	.57	.72	5.71	1.86	1.62	5.79	.81	.7
Spring									
Boy									
M	.85	1.59	.65	4.30	4.33	3.12	13.39		
SD	.75	.80	.67	4.41	3.80	2.58	13.59		
Girl									
M	.59	1.70	1.09	2.86	3.50	3.31	9.98		
SD	.74	.02	.64	2.64	2.79	2.27	10.49		

Note. NegAtt = negative attitude towards bullying; Dom = dominance; ProAg = proactive aggression.

Rushton, Brainerd, & Pressley, 1983). The aggregates of bullying and victimization measures were derived from the standardized sums of direct observations, diaries, peer nominations, and self-report measures.

For the single indicator analyses, the effects of time and gender on each measure were determined with a 5 (5th, 6th first half, 6th second half, 7th first half, 7th second half) by 2 (gender) repeated-measures analysis of variance (ANOVA) one-tail test; time was a within subjects variable, and gender was a between-subjects variable. Multiple

comparisons were made according to Students' Newman-Keuls procedure, at .05.

Regarding variation in proactive aggression from 5th through 7th grades, a significant effect for time ($F(4,436) = 10.59, p < .0001$), as well as a significant time by gender interaction was found ($F(4,436) = 3.79, p < .01$). While proactive aggression decreased with time, differences between boys and girls, which were not significant in primary school, became significant in middle school, and stayed that way.

In examining changes in self-reported bullying from 5th through 7th grade, a significant gender effect ($F(1,106) = 8.49, p < .002$), was observed; boys, more than girls, self-reported being bullies. The effect for time was also significant ($F(4,106) = 2.03, p < .04$), where it increased significantly from 5th to 6th grade, and then decreased at the start of 7th grade and did not change significantly until the end of 7th grade.

For the aggregate bullying measure a 2 (gender) by 4 (time: 6th first half, 6th second half, 7th first half, 7th second half) repeated-measures ANOVA revealed significant main effects for gender ($F(1,357) = 14.42, p < .0001$), and time ($F(3,357) = 5.46, p < .008$), as well as a significant time by gender interaction ($F(3,357) = 3.21, p < .01$). The main effects indicated that boys bullied more than girls, and this decreased with time, but the interaction suggested that the decreases with time were only significant for boys.

Self-reported negative attitudes towards bullying were affected significantly by both gender ($F(1,106) = 22.14, p < .0001$) and time ($F(4,106) = 19.51, p < .0001$). Girls' attitudes toward bullying were more negative than boys. With time, attitudes towards bullying became less negative. The greatest negativity was reported in the 5th grade, decreasing significantly in 6th and then again in 7th grades.

Dominance varied significantly with time ($F(4,436) = 5.34, p < .0001$), decreasing significantly from 5th through 6th grades and increasing again in 7th grade. It also varied according to a time by gender interaction ($F(4,436) = 2.64, p < .03$), where boys were rated as more dominant than girls at 7th grade.

Bullying as a mediator of dominance

Next we tested, with hierarchic regression analyses, the mediational role of bullying in the changes associated with dominance as children moved from 5th through 7th grades. The path (Path C) from 5th to 7th grade dominance was significant ($R^2 = .03, \beta = .199$), as was the path (Path A) from 5th grade dominance to beginning of 7th grade self-reported bullying ($R^2 = .04, \beta = .201$), and from beginning of 7th grade bullying to 7th grade dominance (Path B, $R^2 = .07, \beta = .264$). When Paths A and B were controlled statistically, Path C was no longer significant ($R^2 = .01, \beta = .14$); thus, the mediational hypothesis was supported, following the stipulations of Baron and Kenny (1986).

Changes in victimization

For victimization from 5th through 7th grades, a significant effect for time was observed ($F(4,106) = 10.2, p < .0001$); the highest levels were reported in 5th grade, and they decreased significantly at each time intervals until the end of 7th grade, when rates became greater than those reported at the start of 7th grade and the end of 6th grade.

Variation in the aggregate measure of victimization, measured from the start of 6th grade through the end of 7th grade, was assessed with a gender (2) by time 4 (6th grade beginning and end and 7th grade beginning and end) repeated-measures ANOVA. Significant main effects for both gender ($F(1,357) = 7.77, p < .003$) and time ($F(3,357) = 11.03, p < .0001$) were observed, as was a time by gender interaction

($F(3,357) = 2.25, p < .02$). Boys were victimized more than girls at each time interval, except at the beginning of 6th grade. Further, victimization decreased significantly from 6th grade to the start of 7th grade, and then increased again significantly at the end of 7th grade.

Next, we examined the extent to which boys and girls aggressed against same and opposite sex peers. The data for these analyses were derived from direct behaviour observations conducted during the 6th and 7th grades. A 4 (time: 6th Autumn and Spring and 7th Autumn and Spring) \times 2 (sex of initiator) \times 2 (sex of target) ANOVA was utilized. Descriptive statistics for these analyses are displayed in Table 5. The relevant analyses here were for the main effects for sex of initiators and sex of target, and their interactions with time. A significant main effect was observed for sex of target of aggression ($F(1,154) = 17.62, p < .0001$). Boys, more than girls, were targets of aggression. This main effect was moderated by an interaction with sex of the initiator ($F(1,154) = 39.67, p < .001$), whereby boys targeted boys more than they targeted girls, and girls targeted girls more than boys targeted girls. There was also a significant sex of target \times sex of initiator \times time interaction ($F(1,462) = 5.43, p < .003$). Whereas boy–boy aggression increased during the first year and then declined, boy-to-girl aggression remained flat across the period. By 7th grade, no instances of cross-sex aggression were observed.

Table 5. Descriptive statistics for cross-sex and same-sex aggression

	6th autumn		6th spring		7th autumn		7th spring	
	M	SD	M	SD	M	SD	M	SD
Boy–boy	0.07	0.2	0.16	0.32	0.06	0.18	0.12	0.39
Boy–girl	0.05	0.09	0.01	0.06	0	0	0	0
Girl–boy	0.01	0.1	0.06	0.15	0.03	0.12	0.08	0.35
Girl–girl	0.04	0.14	0.08	0.21	0	0	0	0

Changes in peer affiliation from primary to secondary school

As indicated above, analyses across all three grades were conducted with limited measures representing each construct. In analyses across 6th and 7th grades, aggregate measures from different informants were used. Aggregation was accomplished by summing standardized measures of each construct. At 5th, 6th, and 7th grades, friendships and like most nominations were significantly, at .05, inter-correlated, respectively, $r = .23, .19$, and $.41$. In the analysis for variation in affiliation from 5th through 7th grades, affiliation (the sum of standardized like most and reciprocal friendship nominations) varied significantly with time ($F(4,288) = 6.45, p < .0001$). Affiliation at 5th grade decreased significantly through the start of 7th grade.

The aggregate measure of social affiliation was defined in terms of the standardized sums of the following measures at the beginning and end of both 6th and 7th grades: like-most and reciprocal friend nominations and behavioural observations of cooperative behavior. The effects of gender (2) and time (4) were assessed with a within-subjects ANOVA. A significant effect for time ($F(3,348) = 7.03, p < .002$) was observed where affiliation increased from the start to the end of 6th grade and remained stable through 7th grade.

Affiliation and victimization

To investigate the ability of like most and friends to predict victimization over time, the former two variables were used as dynamic predictors in Level 1 models using hierarchical linear modeling (HLM) for repeated measures. For the i th subject's score at the j th time point, the dynamic Level 1 model with one predictor is defined as

$$Y_{ij} = \beta_{0i} + \beta_{1i} X_{ij} + r_{ij}, \quad (1)$$

where X_{ij} is the dynamic predictor, r_{ij} is a residual, and β_{0i} and β_{1i} are the i th subject's random intercept and random slope, respectively (random meaning each term has a random error component associated with it; see Bryk and Raudenbush, 1992). Like-most and friends were analysed in separate one-predictor models and together in a two-predictor model.

Descriptive statistics showed that raw victimization scores were positively skewed. A \log_{10} transformation was used to normalize the data. Table 6 shows the results for the two one-predictor models of Equation 1. In both cases, the omnibus Chi-square difference test was significant justifying the adoption of the Equation 1 model over an intercept-only model. In both models, the slope term was negative and significant, indicating that changes in \log_{10} (victimization) were associated with reciprocal changes in like most and friends. Furthermore, the values of the slope were very similar across the models.

In order to determine the relative importance of like most and friends, a dynamic Level 1 fixed-effects model was used. For the i th subject's score at the j th time point, the dynamic Level 1 fixed-effects model with two predictor is

$$Y_{ij} = \beta_{0i} + \beta_{1i} X_{1ij} + \beta_{2i} X_{2ij} + r_{ij}, \quad (2)$$

where X_{1ij} is like-most, X_{2ij} is friends, β_{0i} is the random intercept, and β_{1i} and β_{2i} are fixed (meaning there is no random error component associated with them). There are two reasons for using a fixed-effects model when analysing the two predictors simultaneously. First, the slope terms associated with each predictor in the Equation 1 model did not have a significant variance in the population (as shown by Chi-square tests not presented) indicating that subjects have a constant value for these parameters. Second, there was a substantial correlation between the two predictors over time, leading to unreliable random effects results. It should be noted that the degrees of freedom for the fixed-effects tests are much larger than the random-effects tests, the former being based on the total number of time points, and the latter the total number of subjects (for details, see Bryk and Raudenbush, 1992). In addition, the omnibus test for the Equation 2 model was a general linear contrast test of $H_0: \beta_1 = \beta_2 = 0$.

Table 7 shows the results of the two-predictor model of Equation 2. The omnibus test is significant indicating at least one of the predictor parameter weights are not zero. The regression weights indicate that both the predictors have a negative relationship with \log_{10} (Victimization) across time. However, only the t -test of like-most is significant, which is an indication that it is more important than friends in predicting \log_{10} (Victimization) over time.

Table 6. Results for the single-predictor models

Predictor	Estimates	SE	t	d.f.	p
Like-most	$\hat{\beta}_0 = .832$	.034	24.35	121	< .001
	$\hat{\beta}_1 = -.041$	.012	-3.33	121	.001
	$\chi^2(3) = 9.86, p = .020$				
Friends	$\hat{\beta}_0 = .822$	.034	24.55	121	< .001
	$\hat{\beta}_1 = -.054$	.020	-2.71	121	.007
	$\chi^2(3) = 10.90, p = .012$				

Note. The response variable is log₁₀ (victimization).

Table 7. Results for the two-predictor model

Predictor	Estimates	SE	t	d.f.	p
Like-most	$\hat{\beta}_0 = .849$	.035	24.21	121	< .001
	$\hat{\beta}_1 = -.026$	.013	-2.01	485	.044
Friends	$\hat{\beta}_2 = -.036$	.022	-1.68	485	.093
	$\chi^2(2) = 11.88, p = .003$				

Note. The response variable is log₁₀ (victimization).

Discussion

Changes in bullying, proactive aggression, and dominance from primary to secondary school

First, we consider longitudinal changes in proactive aggression, bullying, and dominance. Conceptually and empirically, these constructs are inter-related to the extent that proactive aggression and bullying are both instrumental in nature (Coie & Dodge, 1998), and both, in turn, may be used to establish dominance as individuals enter new peer groups (Bjorklund & Pellegrini, 2000; Pellegrini & Bartini, 2001). We hypothesized that bullying and aggression would initially increase and then decrease across time and that boys, more than girls, would engage in bullying and aggressive behaviour. These hypotheses were generally supported.

Gender differences reflect the fact that boys' use of each form of aggression increased, *vis-à-vis* girls, as they progressed through middle school. It seems to be the case that boys, more than girls, view aggression and bullying more positively as they progress through the early phases of adolescence. This interpretation is consistent with our analyses of attitudes toward bullying. Bullying and proactive aggression are also viewed positively by peers during the period of early adolescence (e.g. Graham & Juvonen, 1998; Pellegrini *et al.*, 1999), possibly, because they represent one way in which individuals can assert their individuality and independence by exhibiting behaviour that is antithetical to adult norms (Moffitt, 1993).

We also hypothesized that bullying would increase as youngsters made the transition from primary to secondary school to try to establish dominance in a new peer group. After this initial transition period, dominance should increase and bullying decrease. Our analyses supported this hypothesis. The trend of an increase in bullying as youngsters make the transition from primary to secondary school is inconsistent with

Olweus' national samples in Sweden and Norway but consistent with other large-scale national studies in Australia (see Smith *et al.*, 1999 for summary) and the USA (National Center for Educational Statistics, 1995). In cases where youngsters of this age did not change schools, as in Ireland and England, bullying declines, uninterruptedly (Smith *et al.*, 1999).

The inconsistency between Olweus' data and our data, as well as national samples in Australia and America, showing increases as youngsters make the change from primary to secondary schools, may be due to a host of national differences, such as the well-publicized anti-bullying campaigns in Norway and Sweden. Clearly, the question of changes in rates of bullying at different transition points merits future study.

Furthermore, bullying mediated dominance as youngsters made the transition to middle school. Results suggest that dominance operated through bullying strategies as youngsters entered a new social group. The relatively small, but significant, amount of total variance accounted for suggests that other factors, such as school environmental variables, may be at play.

Some dominance theorists define dominance as group leadership (Hartup, 1983; Pellegrini & Bartini, 2001; Vaughn, 1999), and individuals use both aggression and prosocial behaviour to establish and maintain status with their peers. From this view, aggressive strategies are often used in the initial phases of the formation of dominance relationships, such as when individuals enter a new school. After the initial transition, more prosocial and cooperative strategies are used to consolidate status and allies and reconcile former foes (deWaal, 1986; Ljungberg *et al.*, 1999). This description is consistent with our self-reported bullying and dominance data as youngsters made the transition from one school (in the 5th grade) to another (in 6th and 7th grades). That is, self-reported bullying increased from 5th to 6th grade, then decreased from 6th to 7th grades. Correspondingly, dominance dropped from 5th through 6th grades and increased in 7th.

Changes in victimization

Regarding victimization, we found a significant drop in the self-report data from the end of primary to the start of secondary school (5th to 6th grade). The aggregate victimization data also showed a decline. While this decrease is consistent with reported general decreases (where rates were not differentiated by gender) in victimization as youngsters mature (Smith *et al.*, 1999; 2001), the decrease is moderated by gender; boys are victimized more than girls. Boys are probably victimized more than girls for a number of reasons. First, boys of this age affiliate with other boys, more than with girls (Maccoby, 1998), and as boys are more frequently aggressive (Maccoby, 1998) and bullies (Pellegrini *et al.*, 1999; Schwartz *et al.*, 1993), it should follow that boys too will be the victims of aggression.

The finding that self-reported victimization decreased with age is seemingly at odds with the self-reported increases in bullying. First, it may be the case, that with experience, youngsters who were initially victims, learned to avoid, ignore, and retaliate against bullies. (Smith *et al.*, 2001). It also may be the case that the targets of bullying were limited to a specific group. That bullies target a limited group of victims is well documented, at least with preschool (Patterson, Littman, & Bricker, 1967) and primary school children (Perry, Willard, & Perry, 1990; Schwartz *et al.*, 1993). This explanation is also consistent with uses of physical aggression as adolescent boys make the transition into and across middle school (Pellegrini & Bartini, 2001). Specifically, as

boys enter middle school, they attempt to establish their dominance by acting aggressively towards a specific set of boys (e.g. tough boys, boys with low peer reputations), not against the general population of boys in the school. A direct test of this hypothesis would necessitate observing initiators and targets of victimization bouts.

We also examined the extent to which boys targeted girls in aggressive bouts. Previous research suggests that youngsters who are victimized in childhood by same-sex peers are also victimized in heterosexual relationships in adolescence (Craig *et al.*, 2001). These results, as the authors themselves indicate, should be interpreted very cautiously given methodological limitations. In the present study, we addressed the problem of biases associated with self-reports by using direct observations to document cross-sex aggression. Our results indicated that boys were most frequently the targets of aggression initiated by other boys. Boys least frequently aimed their aggression at girls. Indeed, girls were most frequently targeted by other girls.

These results are best interpreted in a dominance theory framework, whereby males use aggression against other males, not females, to establish and maintain status in male groups (e.g. Chance, 1978; Pellegrini & Bartini, 2001). This status, in turn, is attractive to female adolescents (Bukowski *et al.*, 2000; Pellegrini & Bartini, 2001). Future research should examine more closely the ecology surrounding boys' uses of bullying strategies. For example, is it done in the presence of girls so that they can exhibit their physical prowess?

Changes in peer affiliation from primary to secondary school

One of the hallmarks of early adolescence is the rapid and qualitative changes in social affiliations. These changes are precipitated by processes associated with the onset of puberty as well as corresponding changes in social institutions, with the change from primary to secondary school being especially relevant. These changes come at a time when the peer group is taking on increased importance for youngsters (Eccles *et al.*, 1998; Simmons & Blyth, 1987). A long-standing critique of middle schools and junior high schools, especially in America, is that they do not support youngsters' formation of new cooperative, social groupings but instead exacerbate fractured social groups by having youngsters attend large schools that simultaneously stress competition over cooperation (Eccles *et al.*, 1998).

In this study, we examined changes in peer affiliation as youngsters made the transition from primary through the first 2 years of middle school. Consistent with our hypothesis, youngsters' affiliations decreased, at least initially, and then began to recover in the 7th grade. It is probably the case that students' social affiliations decreased because they were entering a new and much larger social institution, even though the schools made some effort to foster informal interaction among peers. With time, peer affiliation increased.

Although both middle schools studied provided some opportunities for youngsters to affiliate with peers, they were seemingly slow to take effect. For example, the weekly free time (called 'Coke Breaks') typically occurred during the final hour of classes on Friday afternoons. Youngsters went to a central gathering place, purchased a soft drink, and then went back to their home rooms. More concentrated mechanisms may be needed during the first year of middle school to foster more varied and closer relationships within these larger social networks during the school day. Social and interest-specific events, such as clubs, limited to 6th graders could be organized. If the events are of adequate duration and frequency, peer relationships may be formed and

increase in number. These peer affiliations, in turn, may be important buffers of subsequent victimization.

Results of hierarchical linear modelling showed how both the number of like-most and reciprocal friendships nominations buffered victimization. That the number of like-most nominations was more potent than the number of reciprocal friendships replicates earlier contemporaneous research (Pellegrini *et al.*, 1999). It is probably the case that being liked by a number of peers inhibited victimization because bullies feared damage to their social reputations and fear of retribution. This explanation is consistent with our view that bullying is used in the service of dominance. Additionally, the separate contributions of like most and friendship nomination to victimization supports the notion that the two are separate constructs (Bukowski & Hoza, 1989).

Future research should examine more fully the role of dominance in bullying. Most immediately, we need to specify the resources for which individuals are competing. It is probably the case that resources for adolescents may relate to heterosexual relationships and that both males and females compete for access to opposite-sex peers (Pellegrini & Bartini, 2001). From this view, boys use physically aversive strategies with each other, like bullying, to establish and maintain dominance; these dominant boys are, in turn, attractive to girls (Bukowski *et al.*, 2000; Pellegrini & Bartini, 2001). Girls, however, may use relational aggression against other girls to gain access to males.

Campbell's (1999) hypothesis on females' aggression is relevant to this issue and worthy of direct empirical testing. She posits that physically attractive adolescent girls should use indirect, or relational aggression, against other girls in the service of gaining access to males. From this view, physical attractiveness should predict relational aggression, which, in turn, should predict heterosexual activity.

The fact that youngsters', but especially boys', views of bullying became less negative with time is both interesting and troubling. This trend may be related to the fact that boys target other boys for victimization and that their empathy for boys in distress decreases during this period, whereas boys' and girls' empathy for girls increases at this time (Olweus & Endresen, 1996).

From a policy perspective, these trends are indeed troubling. As peer groups, schools, and families are major socialization agents of young adolescents, they should be made aware of these views. The negative consequences of these views for both victims and others should be presented to youngsters. Future research should also begin to search for possible origins of these views. Are there any models for these sorts of behaviours in middle schools? We know from Olweus' (1993a) seminal work that school personnel sometimes model bullying behaviour, by belittling or threatening students.

Conclusions

This study contributed to the extant literature on bullying and victimization in a number of conceptual and methodological areas. First, we examined a problem during a period where it had seldom been studied. Extant studies, for the most part, have studied primary school children. The early adolescent period merits attention because it is a period where disruptions in peer affiliations afford opportunities for peer victimization and increased uses of aggression, possibly to establish peer status. Consistent with this proposition, we found that bullying mediated dominance status from primary to middle school. Dominance too, it seems, explains the fact that boys target each other, not

females, in aggressive bouts.

Youngsters' contacts with their peers decreased with the transition, and then increased. The importance of social affiliation as an inhibitor of victimization was also suggested.

Methodologically, this study made a number of contributions. A longitudinal design was used in an area typified by contemporaneous correlational studies. Additionally, we utilized multiple measures from different agents to define our constructs where much of the extant research has relied almost exclusively on the use of single agents and of single measures (e.g. peers' and teachers' ratings and nominations). As such, we increased the validity of constructs like bullying and victimization which, to date, have been based almost entirely on single-measure, single-informant data. Construct validity requires multi-method and multi-source data (Cronbach, 1971; Cronbach & Meehl, 1955).

Additionally, the use of multiple methods and sources minimized shared method variance problems and the associated possibility of Type I error. Relatedly, our methods included extensive amounts of observational data. Youngsters were observed directly in various school venues across the whole school day and across 2 years. Including observational measures adds a more objective perspective. We complemented these direct observations with diaries collected across 2 years. In this way, we could document youngsters' peer groups, aggression, and victimization in those situations that are very difficult to observe directly.

This study also had limitations. Most importantly, we did not have multiple measures of bullying and victimization, but especially direct observational and diary measures, during primary school. Future research should clearly include direct observations. Though expensive, they provide useful sources of objective information.

Our use of observational procedures may have resulted in youngsters reacting to our presence such that they were not aggressive in the presence of observers. We tried to minimize this problem by repeatedly sampling their behaviour across the school day and across two school years. That some level of students' habituation to the presence of observers did occur is suggested by the significant correlations between observed measures of bullying and victimization and peer nominations of these same constructs (Pellegrini & Bartini, 2000).

Furthermore, the role of school-level variables in bullying, victimization, and peer affiliation is important to consider in future work. It would be important to compile descriptions of school-level variables, such as school policies toward bullying, access to counsellors, adult supervision of peer interactions, and opportunities to affiliate with peers, from different perspectives, such as students, teachers, and neutral observers. This level of description could be useful in designing schools for young adolescents that support positive peer relationships and reduce victimization.

Finally, our sample was rather limited as our initial consent rate was relative low. Restricted samples in developmental psychology have been a persistent problem, at least since the warnings sounded by Wright (1960) over 40 years ago. Thus, the generalizability of most of our research is restricted to very limited populations (Bronfenbrenner, 1979).

Limited initial consent is also related to the issue of generalizability. The selective nature of the original sample may indeed be skewed, even though subsequent attrition did not seem to be biased. We compensated for limitations in population-related generalizability, however, by maximizing the generalizability of our constructs through the use of multiple measures and multiple informants.

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