Intergenerational Bonding in School: The Behavioral and Contextual Correlates of Student-Teacher Relationships

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To explore the significance of social integration in the educational system, this study examined whether student-teacher relationships predicted two important student behavioral outcomes (academic achievement and disciplinary problems); whether these within-school intragenerational relationships were predicted by the structural, compositional, and climate-related characteristics of schools; and how the behavioral and contextual correlates of student-teacher relationships varied by race-ethnicity. Our findings, based on nationally representative panel data, indicated that stronger intergenerational bonding in school was associated with higher academic achievement, especially for Hispanic American girls, and with a lower likelihood of disciplinary problems, especially for white girls. Moreover, these intragenerational bonds were stronger in schools with several characteristics (private sector, greater racial-ethnic matching between students and the student body, greater perceived safety, and lower socioeconomic status), although these associations also differed by race-ethnicity.

The alienation of youths has long garnered public and scholarly attention, related as it is to behavioral disorders, family conflict, and larger social problems (Merton 1964; Newman 1981). It has also been prominent in educational research, with an extensive literature demonstrating how students' alienation contributes to academic problems on the individual and institutional levels and larger inequalities on the societal level (Coleman 1961; McLeod 1995; Stinchcombe 1964). This literature has stressed the need to consider more social aspects of schooling, including students' socioemotional adjustment. One method for doing so is to examine how alienation hampers the academic functioning of students and student groups. Another method is to examine how social integration counterbalances these problems. In our study, we took

the second approach by focusing on intergenerational bonding in school.

Student-teacher relationships are the primary source of this type of bonding. Such relationships have been studied extensively—the factors that underlie these relationships (Alexander, Entwisle, and Thompson 1987), their affective dimensions in elementary school (Birch and Ladd 1998), and their instrumental dimensions in secondary school (Rowan, Chiang, and Miller 1997). We integrated these themes by studying whether an affective dimension of student-teacher relationships (students' positive views of their teachers) predicts two key markers of adjustment (academic achievement and disciplinary problems) in secondary school and whether this dimension is predicted by the structure, composition, and climate of the schools in which student-teacher relationships occur. In doing so, we also examined whether these phenomena—the potential behavioral and contextual correlates of intergenerational bonding—differ by race-ethnicity.

Thus, we examined a form of social integration during a stage of the life course that is most closely associated with alienation and how it is embedded in both a key institution and the structure of American society. Conceptually, this research represents two increasingly prominent themes in educational research. First, it recognizes the importance of the interpersonal aspects of education. Working with and against the core mission of schools (e.g., delivering curricula to students), the interpersonal side of schooling has implications for institutional functioning and the general socialization of young people (Johnson, Crosnoe, and Elder 2001). Second, this research recognizes the value of approaching social issues at the intersection of interpersonal and institutional contexts. Individual behavior is closely related to personal relationships, but such relationships are dependent, in part, on the institutions in which they take place. Together, these related themes present an ecologically oriented perspective on educational processes.

STUDENTS AND TEACHERS

We begin this discussion with the role of interpersonal relations in education. Alienation, which refers to feelings of disconnectedness from others and from key social institutions, has been implicated in a variety of educational issues, such as students' behavioral problems and academic failure, as well as the maintenance and stability of schools (Agnew 1997; Crosnoe 2002; Dornbusch 1989; Merton 1964; Newman 1981). On the other hand, social integration can promote more positive outcomes on the student and institutional levels (Coleman 1988; Hirschi 1969). One key source of social integration that serves as an antidote to students' alienation is intergenerational bonding.

Typically, intergenerational bonds have been studied in terms of parent-child relationships, but we argue that other types of intergenerational bonds deserve attention. For example, within schools, young people interact daily with their teachers, who can serve as mentors, models of behavior, and sources of support (Pianta, Steinberg, and Rollins 1995). This study focused on this type of in-school intergenerational bonding, examining students' general feelings about their teachers—how well students get along with their teachers and whether they perceive them to be caring and fair. This focus on teachers as a group is based on past research (Sanders and Jordan 2000; Steinberg, Brown, and Dornbusch 1996), from which we borrow the term *teacher-bonding*. Thus, we examined the tone of students' connections to the teachers in their school, with positive feelings at one end of the continuum and alienation at the other.

Our first objective in this investigation of intergenerational bonding in school was to examine whether positive student-teacher relationships are associated with students' academic functioning. According to social bond theory (Hirschi 1969), strong bonds to social institutions raise the costs of problem behavior, thereby promoting conventional trajectories. By strengthening the connection of students to the normative order of the school, affective bonds with teachers serve

this purpose (Crosnoe 2002). Although research on *adolescents* has typically focused on the instrumental aspects of student-teacher relationships, such as teaching styles and mentoring, rather than on the affective aspects (Good and Brophy 1997; Rowan et al. 1997), an interdisciplinary literature suggests that affective ties with teachers promote the adjustment and learning of *children* through the transmission of social capital and the creation of communal learning environments (Birch and Ladd 1998; Pianta et al. 1995). Recent research has extended this focus on affective dimensions to adolescence with similar results (Muller 2001; Sanders and Jordan 2000).

On the basis of this theory and research, we expect that positive student-teacher relationships serve as protective forces in secondary school, associated with higher academic achievement and fewer disciplinary problems. Although we recognize that these associations can be bidirectional, with well-adjusted students also more likely to bond with teachers, we focus on the protective mechanism in our conceptual discussion and attempt to address selection issues in our longitudinal statistical analyses.

A key aspect of ecological models is that the significance of proximate settings, such as interpersonal relations, may vary across populations, such as those defined by race-ethnicity (Bronfenbrenner and Morris 1998). The effectiveness of this approach has been demonstrated by criminological research, which has reported that the association between social bonding and delinquency differs for white and African American students (Cernkovich and Giordano 1992). We attempt an educational application of this approach by exploring how race-ethnicity moderates the academic significance of social integration in school. In doing so, we address a different concern than has past educational research. Traditionally, such research has focused on racial-ethnic differences in student-teacher relationships and other forms of social integration, finding somewhat inconsistent patterns that sometimes defy popular beliefs about the strong alienation of Hispanic- and African American students in American education (Ainsworth-Darnell and Downey 1998; Alexander et al. 1987; Johnson et al. 2001). Leaving this question open, we turn to a related, yet different, issue: potential racial-ethnic differences in the association between student-teacher relationships and student outcomes.

Thus, the second objective of this study was to examine whether the protective role of student-teacher relationships for academic achievement and disciplinary problems is more important for African- and Hispanic American students than for whites. According to the concept of functional substitution (Mirowsky and Ross 2003), any given resource is more important to those who have fewer resources overall. While African- and Hispanic American youths do not differ from white youths in more socioemotional family resources, they typically have fewer instrumental resources (e.g., information channels, weak ties). This relative dearth of instrumental resources goes beyond finances and socioeconomic status because of the historically greater distance between minority families and the educational system that is rooted in discrimination and distrust (Lareau and Horvat 1999; Stanton-Salazar and Spino 2001). Thus, the more abundant instrumental social capital that flows through affective bonds with teachers may make more of a difference in the lives of African- and Hispanic American students than of whites, for whom such capital is more often redundant. Although this phenomenon has not been examined empirically, related research has shown that affective bonds with teachers have a greater academic impact on other categories of socially and economically disadvantaged youths (Muller 2001).

In pursuing this second objective, we were aware that gender is an important correlate of teacher-bonding and that male and female students of different racial-ethnic groups may experience different levels of, and reactivity to, such bonding. Girls have fewer academic problems than do boys and, at the same time, females in general tend to be more strongly other oriented than are males, more sensitive to the quality of relationships, and more likely to draw support from their personal ties (Beutel and Marini 1995; Fagot 1994; Johnson et al. 2001; Johnson and

Marini 1998; Stanton-Salazar and Spino 2001). On the basis of these patterns, we might expect that the functional substitution argument outlined earlier would apply more strongly to the experiences of minority boys, who are widely considered to be at a greater risk overall, than of minority girls (Stanton-Salazar 1997). In other words, minority boys may be less likely to bond with teachers, but such bonds, if they do exist, will be more important for them. Thus, we expect that the associations between teacher-bonding and student outcomes will be greater among members of racial-ethnic minority groups and even more so among boys in these groups.

STUDENTS, TEACHERS, AND SCHOOLS

Up to this point, we have focused on an interpersonal phenomenon, arguing that intergenerational bonding in school may be related to the functioning of students, especially among certain minority groups. This focus on interpersonal dynamics is a useful approach in educational research because individuals of all ages, but especially young people, react to interpersonal processes. Yet, these processes are not removed from larger social contexts. Whom individuals know, how well they know them, and how close they are to them is dependent, in part, on the larger institutions in which lives are lived (Crosnoe, Cavanagh, and Elder 2003; Kubitschek and Hallinan 1998). The study of an interpersonal phenomenon, therefore, benefits from understanding the intersection of the interpersonal and institutional. Given that the interpersonal phenomenon of interest here largely plays out in schools, this study also examined the link between school context and student-teacher relationships.

If intergenerational bonding within schools is associated with student outcomes, then the third objective of this study was to examine whether aspects of the educational institution are related to such bonding. This possibility has not been examined empirically, and so we derived our conceptual and analytical strategy from the more general literature on "school effects" on achievement and social behavior (Lee and Smith 1993; McNeal 1997). In general, we argue that schools that foster a more communal and academically focused environment promote better student-teacher relationships, just as they influence standard educational outcomes.

In our study, we focused on three aspects of the educational institution: school structure, composition, and climate. In terms of *school structure,* factors that are related to the level and nature of the contact that students have with teachers should predict the strength of bonds that develop. Private schools tend to be less stratified and more intimate than are public schools, allowing widespread and close contact between students and teachers. In both private and public schools, smaller classes would also bring students and teachers into greater contact. Thus, we suggest that two key structural elements are relevant to the interpersonal ties that form within the school: sector (public versus private) and class size (Coleman and Hoffer 1987; Johnson et al. 2001; Lee and Smith 1993).

Composition—who populates the school—is important for students' comfort and willingness to reach out to others. Certainly, a wealth of social psychological research has demonstrated that individuals have strong racial in-group preferences for interaction (Schofield 1993). Indeed, Johnson et al. (2001) found that students' attachment to school was predicted by the percentage of the student body of the students' own race-ethnicity. Closely related to this is racial-ethnic matching between students and their teachers. On an individual level, matching may provide a common ground, while mismatches may hamper the ability of students and teachers to connect (Alexander et al. 1987). These findings could extend to the school level. If most teachers are of a different race-ethnicity from the student, then the student may feel less connection to teachers as a whole. Thus, we expect two compositional elements, the racial-ethnic composition of the student body and teaching staff, to affect levels of teacher-bonding in schools.

The third aspect of the educational institution, *climate,* refers to the general atmosphere

of the school, which has implications for students' ability to trust and form relationships with others in the school. Beyond structural and compositional factors, interpersonal relations are more likely to be collegial in schools that are characterized by a firm pedagogical mission, a strong ethos of success, and freedom from distraction (Coleman and Hoffer 1987; McNeal 1997; Schneider and Coleman 1993). Schools with high average achievement levels and high social-class backgrounds tend to have such strong academic climates. In contrast, safety concerns are a source of distraction from academic endeavors, so schools in which students feel safe may have higher levels of teacher-bonding. By fostering a climate of teamwork in which students can and do focus on schoolwork, schools may also influence the strength of ties among students and teachers, regardless of the family backgrounds or achievement levels of individuals. Thus, we expect climate-related elements, including achievement level, socioeconomic status, and perceived safety, to promote intergenerational bonding.

Just as we expect the association between intergenerational bonding and students' behavior to vary by race-ethnicity, we also expect racial-ethnic variation in the association between institutional context and intergenerational bonding. Past research has demonstrated that both the performance and relationships of traditionally disadvantaged groups, including certain racial-ethnic minorities, are more reactive to variations in school structure and composition than are those of others (Crosnoe et al. 2003; Lee and Smith 1993). This pattern may extend to intergenerational bonding in the school, with African American and Hispanic American students experiencing greater improvements in bonding than whites in schools with the characteristics just described. The fourth objective of this study, therefore, was to examine whether the interplay between school characteristics and student-teacher relationships differs by race-ethnicity, again considering the possible significance of gender in this interplay. To our knowledge, no research has examined this issue, although it is a logical result of our context-specific approach.

METHODS

Data and Sample

This research is based on data from the National Longitudinal Study of Adolescent Health (Add Health), an ongoing nationally representative study of American adolescents in Grades 7–12 that began in 1994. With the use of a stratified sampling design, 80 high schools, most of which contained Grades 9–12 but some that contained Grades 7 and/or 8, too, were selected from a complete list of American high schools, on the basis of their region, urbanicity, sector, racial composition, and size. All the schools that did not contain the 7th and 8th grades were then randomly matched to one middle or junior high school that fed into them, with the probability of the feeder school being selected proportional to its student contribution to the high school. The final sample included 132 schools.

Nearly all the students in these schools (approximately 90,000) completed the In-School Survey in the 1994–95 school year. Of these students, a subgroup, who were selected evenly across high school–feeder school pairs, participated in two waves of the In-Home Interview in 1995 and 1996. A total of 14,736 adolescents participated in both waves. We supplemented these data with information obtained from an official in each school and used the original In-School Survey to create additional school-level variables by aggregating responses from all students in a school. The In-School samples ranged from a minimum of 25 to over 2,500 students per school.

Our study sample included all adolescents in the longitudinal In-Home Sample with valid sampling weights, which were necessary to correct the oversampling of some groups in Add Health (Chantala and Tabor 1999). This study sample included 13,570 adolescents. Because of listwise deletion of missing data, some adolescents were dropped from the multivariate analyses. Thus, our analytical sample contained 10,991 adolescents in 126 schools who were nonmissing on all study variables.

Table 1 presents statistics on key variables for the longitudinal In-Home sample, our

study sample, and our analytical sample. The study sample was virtually identical to the full longitudinal In-Home sample. The analytical sample differed slightly on some characteristics. In these cases, the analytical sample was generally higher in social adjustment and advantage. This potential bias was relatively minor and, we argue, balanced by the value of using longitudinal, multilevel national data.

Measures

In this section, we describe the focal variables of the study in detail. The descriptions of all other variables are presented in the Appendix. Most variables were based on adolescents' self-reports. The accuracy of this method of measuring academic achievement, problem behavior, and the characteristics of parents has long been debated. Empirical evidence suggests that adolescents' self-reports are generally adequate indicators of such factors, especially among high school students who live at home, but should be presented with the appropriate caveats—adolescents tend to inflate their grades and underreport their problem behaviors, and the accuracy of their reports on parents' characteristics is lower in more disadvantaged populations (Dornbusch et al. 1990; Looker 1989; Mare and Mason 1980).

Teacher-bonding In Wave I, students responded to three items about teachers: the extent to which they had trouble getting

Table 1. Comparisons of Three Samples on Key Study Variables

	Means (unweighted)		
Variables	Sample 1[a]	Sample 2[b]	Sample 3[c]
Sociodemographic Factors			
Parental education	4.89	4.90	4.99
Grade level	9.32	9.34	9.24
White female	.26	.27	.28
White male	.25	.25	.26
African American female	.11	.11	.12
African American male	.10	.10	.10
Hispanic American female	.08	.08	.08
Hispanic American male	.08	.08	.08
Academic Factors			
Wave II academic achievement	2.79	2.80	2.81
Wave II disciplinary problem	.11	.11	.11
Wave I teacher-bonding	3.71	3.71	3.74
School Factors			
Sector (private school)	.07	.07	.08
Estimated class size	26.63	26.62	26.48
Students of own race-ethnicity (decile)	5.57	5.57	5.62
Estimated white teachers (decile)	7.94	7.95	7.97
Mean achievement (GPA)	2.80	2.80	2.80
Mean parental education	4.65	4.65	4.69
Mean feelings of safety	3.70	3.70	3.72
n	14,738	13,570	10,991

Note: Racial-ethnic and gender groups do not total 100 percent because frequencies for Other racial-ethnic groups are not shown.

[a] Full longitudinal In-Home Sample.

[b] Study sample (longitudinal In-Home sample with valid sampling weights).

[c] Analytical sample (study sample with no missing data).

along with teachers, felt that teachers cared about them, and believed that teachers treated students fairly in their school. Responses ranged from 1 to 5 ("almost every day" to "never" for the first item, "never" to "very much" for the second, and "strongly disagree" to "strongly agree" for the third). These items (with correlations among them ranging from .29 to .38) were averaged (α = .68, M = 3.71, SD = .77). The first two items referred to the quality of students' relationships with teachers, and the third referred to whether students' assessments of teachers were positive or negative. Thus, like a similar measure created for the National Educational Longitudinal Study, this composite tapped students' general feelings about teachers in their school (Sanders and Jordan 2000).

Academic Achievement In Waves I and II, adolescents reported their grades in mathematics, science, English, and social studies in the past year. These responses, ranging from 1 (D/F) to 4 (A), were averaged across subjects and then converted to a standard four-point average (M = 2.77, SD = .77 in Wave I and M = 2.80, SD = .76 in Wave II).

Disciplinary Problems In Wave I, adolescents reported whether or not they had ever been suspended or expelled from school. In Wave II, they reported whether they had been suspended or expelled in the past year. We created a binary measure for each wave, with a score of 1 indicating suspension/expulsion (M = .28, SD = .45 in Wave I and M = .11, SD = .31 in Wave II). The difference in prevalence between the two waves is a result of the different wording of the question between the two waves (e.g., ever versus past year).

Individual-level Independent Variables Grade level (dummy variables for the 7th–12th grades), parental education, family structure, and verbal ability, all measured at Wave I, were controlled in all the analyses. We also created a set of dummy variables designating race-ethnicity and gender categories: females and males who were non-Hispanic white, African American, Hispanic American, and Other race-ethnicity. The Other category included mainly Asian American and Native American youths.

School-level Variables We constructed measures for three sets of school variables. Structural characteristics included sector and class size. Compositional characteristics included the percentage of students of the respondent's race-ethnicity and of white teachers in the school. Ideally, we would have used a measure of the percentage of teachers of the respondent's race-ethnicity, paralleling the measure for student's racial-ethnic composition, but this measure was skewed to such a degree that it would have been problematic for multilevel analysis. Climate characteristics included mean levels of academic achievement, parental education, and perceived safety in the school.

Plan of Analyses

Our first two research questions involved the analysis of teacher-bonding as a *predictor.* For the first student outcome, we regressed the Wave II measure of academic achievement on the Wave I measures of achievement, teacher-bonding, race-ethnicity and gender category, and other individual factors. This model provided information on the longitudinal association between teacher-bonding and achievement across one year. We then added to this model interaction terms for teacher-bonding and the race-ethnicity and gender dummy variables to examine whether this longitudinal association varied by race-ethnicity and gender group. Because of the school-based clustering of Add Health data, we estimated these individual-level models with the mixed procedure in SAS, a type of multilevel or hierarchical linear modeling (see Singer 1998), to obtain robust standard errors. We repeated these steps for the second student outcome, disciplinary problems, with one key difference. Because this outcome was binary, we used the glimmix macro in SAS to adapt the mixed procedure from linear to logistic regression.

Our second two research questions involved the analysis of teacher-bonding as an *outcome.* We regressed Wave I teacher-bonding on the seven school factors, the race-ethnicity and gender dummy variables, and the other individual-level factors, all measured at Wave I. This model, again estimated

with the mixed procedure in SAS, provided information on the cross-sectional association between aspects of the educational institution and teacher-bonding. We then included interaction terms for each race-ethnicity and gender dummy variable with each school factor. This model provided information on whether the cross-sectional association between aspects of the educational institution and teacher-bonding varied by race-ethnicity and gender group.

RESULTS

An Overview of Students, Teachers, and Schools

The purpose of this study was to examine the role of intergenerational bonding within schools in students' academic behavior and how such bonding was related to institutional context, with a special emphasis on racial-ethnic variation. Before we turn to our multivariate analyses of these patterns, we provide a general picture of student-teacher relationships and of the differences among boys and girls from different racial-ethnic groups in academic outcomes and the schooling environment. Note that from this point on, our discussion focuses solely on white, African American, and Hispanic American youths, with the catchall Other racial-ethnic category treated as a statistical control only.

As has been previously reported for younger children, the adolescents generally, although not uniformly, viewed their teachers positively, with a mean score of 3.74 on a scale of 1 to 5. Breaking down this composite into its constituent items revealed that the students reported little trouble with their teachers but that they were far more neutral about whether their teachers cared for them (modal category = "somewhat") or were fair (over 40 percent could not agree with this item). As is shown in Table 2, white and Hispanic American girls had slightly, but significantly, more positive perceptions of teachers than did all others.

In school, white girls had the highest grades and the least disciplinary problems, while African American boys had the lowest achievement and the greatest disciplinary problems. The other groups fell in between these poles. Closer to the white girls were white boys and African American girls, who had moderate levels of both achievement and disciplinary problems. Closer to the African American boys were the Hispanic American boys, who had low achievement and a moderate level of disciplinary problems. Finally, the Hispanic American girls were something of an anomaly—doing less well academically but also unlikely to have disciplinary problems in school. Thus, the introduction of gender appeared to alter many of the expected racial-ethnic differences in school behaviors, with girls doing better than boys and mitigating risks within their races-ethnicities. Turning to school factors, minority students, both male and female, tended to be concentrated in more problematic schooling environments, defined in multiple ways.

Intergenerational Bonding and Student Outcomes

To begin our analysis of student-teacher relationships, we examined their role in students' behavior. Specifically, this analysis centered on two questions: Were positive relationships with teachers associated with better achievement and fewer disciplinary problems, and, if so, did these associations differ by race-ethnicity?

Table 3 presents the results for academic achievement. The set of independent variables explained approximately 40 percent of the within-school variance in achievement. Controlling for sociodemographic factors and prior achievement, we found that teacher-bonding was positively related to later achievement ($b = .05$, $p < .001$ in Model 1). The effect size was not large, but it was roughly equivalent to or exceeded that of every demographic factor in the model (see β coefficients).

By estimating Model 1 with various racial-ethnicity and gender groups as the reference category, we could better examine racial-ethnic differences in achievement. Net of other factors, white girls had the highest achievement, followed by (1) African American and Hispanic American girls, who did not differ

Table 2. Descriptive Statistics for Academic and School Factors, by Race-Ethnicity and Gender (Means; standard deviations are in parentheses)

Factors	White Female	White Male	African American Female	African American Male	Hispanic American Female	Hispanic American Male
Academic Factors						
Wave I academic achievement	3.02[a]	2.77[b]	2.74[b]	2.50[d]	2.68[c]	2.51[d]
	(.73)	(.78)	(.69)	(.68)	(.71)	(.72)
Wave II disciplinary problem	.06[c]	.12[b]	.13[b]	.23[a]	.07[c]	.13[b]
	(.23)	(.32)	(.33)	(.42)	(.26)	(.33)
Wave I teacher-bonding	3.77[a]	3.67[b]	3.65[b]	3.66[b]	3.78[a]	3.69[b]
	(.73)	(.78)	(.79)	(.81)	(.74)	(.80)
School Factors						
Sector (private school)	.09[a]	.09[a]	.06[b]	.05[b]	.04c[d]	.03[d]
	(.28)	(.28)	(.24)	(.23)	(.20)	(.18)
Estimated class size	24.66[c]	24.81[c]	27.15[b]	27.42[b]	29.88[a]	30.15[a]
	(4.90)	(4.73)	(5.66)	(5.62)	(5.90)	(5.61)
Students of own race-ethnicity (decile)	7.24[a]	7.36[a]	4.55[b]	4.51[b]	4.58[b]	4.45[b]
	(2.00)	(1.98)	(2.75)	(2.79)	(2.77)	(2.67)
Estimated white teachers (decile)	9.25[a]	9.29[a]	6.11[c]	6.18[c]	6.80[b]	6.88[b]
	(1.20)	(1.21)	(2.83)	(2.84)	(2.55)	(2.51)
Mean achievement (GPA)	2.86[a]	2.86[a]	2.73[b]	2.73[b]	2.70[c]	2.70[c]
	(.23)	(.23)	(.23)	(.22)	(.27)	(.27)
Mean parental education	4.70[a]	4.69[a]	4.69[a]	4.68[a]	4.38[b]	4.38[b]
	(.74)	(.71)	(.74)	(.71)	(.68)	(.65)
Mean feelings of safety	3.84[a]	3.84[a]	3.57[b]	3.56[b]	3.53[c]	3.52[c]
	(.30)	(.30)	(.29)	(.29)	(.27)	(.28)
n	3,610	3,441	1,558	1,335	1,149	1,149

Note: Means with different superscripts differed significantly ($p < .001$) across racial-ethnic and gender groups, according to a one-way ANOVA, with [a] indicating the highest mean. Results for Other racial-ethnic groups are not shown.

significantly from each other; (2) white boys, whose achievement was significantly lower than that of African American girls but roughly equivalent to that of Hispanic American girls; and (3) Hispanic American and African American boys, who did not differ significantly from each other in achievement. Next, we included interaction terms for each race-ethnicity and gender dummy variable with teacher-bonding to examine variation in the association between teacher-bonding and achievement. The sole significant interaction revealed that this positive association was greater for Hispanic American girls than for white girls (see Model 2). Additional analyses revealed that this association was also true of Hispanic American girls compared to white boys and African American boys. Thus, all students made better grades when they had more positive views of teachers, but this was more true of Hispanic American girls than it was for most boys and for whites.

Table 4 presents the results for disciplinary problems. Including the individual-level independent variables in the unconditional model explained approximately 14 percent of the

Table 3. Results of Linear Random-Effects Models Predicting Wave II Academic Achievement

	Model 1			Model 2	
Variable	*b*	*SE*	*β*	*b*	*SE*
White male (WM)[a]	-.11***	.01	-.07	-.12***	.01
African American female (AF)	-.05*	.02	-.02	-.05*	.02
African American male (AM)	-.19***	.03	-.08	-.19***	.03
Hispanic American female (HF)	-.09***	.03	-.03	-.09***	.03
Hispanic American male (HM)	-.16***	.03	-.06	-.16***	.03
Other racial-ethnic female (OF)	-.03	.03	-.01	-.03	.03
Other racial-ethnic male (OM)	-.05	.03	-.01	-.05	.03
Enrolled in 7th grade[b]	.03	.02	.01	.03	.02
Enrolled in 8th grade	-.11***	.02	-.05	-.11***	.02
Enrolled in 9th grade	-.02	.02	.01	-.02	.02
Enrolled in 11th grade	.08***	.01	.04	.08***	.01
Enrolled in 12th grade	-.03	.03	-.01	-.03	.03
Parental education	.02***	.00	.05	.02***	.00
Family structure (two-parent family)	.06***	.01	.04	.06***	.01
Estimated verbal ability	.01***	.00	.07	.01***	.00
Wave I academic achievement	.55***	.01	.56	.55***	.01
Teacher-bonding[c]	.05***	.01	.05	.03**	.01
WM * teacher-bonding	—	—	—	.00	.02
AF * teacher-bonding	—	—	—	.04	.03
AM * teacher-bonding	—	—	—	-.01	.03
HF * teacher-bonding	—	—	—	.09**	.03
HM * teacher-bonding	—	—	—	.05	.03
OF * teacher-bonding	—	—	—	.06	.05
OM * teacher-bonding	—	—	—	.01	.04
Intercept	1.11***	.03		1.11***	.03
n	10,991			10,991	

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

Note: All models contained a random intercept for Wave II academic achievement. Because Model 2 contains interaction terms, we did not include standardized coefficients for this model.

[a] White females served as the reference category for the race-ethnicity and gender dummy variables.

[b] 10th graders served as the reference category for the grade-level dummy variables.

[c] Teacher-bonding centered around the sample mean in both the main effects and interaction terms.

within-school variance in this outcome. When prior problems, as well as sociodemographic factors, were controlled, teacher-bonding predicted a lower likelihood of later disciplinary problems ($b = -.50$, $p < .001$ in Model 1). The odds ratio for this longitudinal association indicates that the odds of disciplinary problems decreased by 39 percent with every unit increase in bonding. In standardized form (not shown), the magnitude of this effect size exceeded that of all demographic factors, as well as estimated verbal ability.

Rotating the reference category for the race-ethnicity and gender groups in Model 1

Table 4. Results of Logistic Random-Effects Models Predicting Wave II Disciplinary Problems

	Model 1			Model 2		
Variable	*b*	*SE*	Odds Ratio	*b*	*SE*	Odds Ratio
White male (WM)[a]	.47***	.10	1.58	.56***	.11	1.75
African American female (AF)	.30*	.13	1.35	.40**	.14	1.49
African American male (AM)	.97***	.13	2.64	1.08***	.13	2.94
Hispanic American female (HF)	-.01	.16	.99	.13	.17	1.14
Hispanic American male (HM)	.48***	.15	1.62	.59***	.15	1.80
Other racial-ethnic female (OF)	-.02	.21	.99	-.04	.24	.96
Other racial-ethnic male (OM)	.53**	.17	1.70	.62**	.18	1.86
Enrolled in 7th grade[b]	.69***	.12	1.99	.69***	.12	1.99
Enrolled in 8th grade	.45***	.12	1.57	.44***	.12	1.57
Enrolled in 9th grade	.37***	.10	1.45	.36***	.10	1.43
Enrolled in 11th grade	.01	.10	1.01	.01	.10	1.01
Enrolled in 12th grade	-1.30***	.39	.27	-1.29***	.39	.28
Parental education	-.10***	.02	.90	-.10***	.02	.90
Family structure (two-parent family)	-.20**	.07	.82	-.20**	.07	.82
Estimated verbal ability	-.01***	.00	.99	-.01***	.00	.99
Wave I disciplinary problems	1.63***	.07	5.10	1.63***	.07	5.10
Teacher-bonding[c]	-.50***	.04	.61	-.79***	.10	.45
WM * teacher-bonding	—	—	—	.32**	.12	1.38
AF * teacher-bonding	—	—	—	.33*	.14	1.39
AM * teacher-bonding	—	—	—	.40**	.14	1.49
HF * teacher-bonding	—	—	—	.67***	.20	1.95
HM * teacher-bonding	—	—	—	.37*	.16	1.45
OF * teacher-bonding	—	—	—	-.03	.26	.97
OM * teacher-bonding	—	—	—	.27	.22	-1.31
Intercept	-2.58***	.16	—	-2.67***	.17	—
n	10,991			10,991		

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

Note: All models contained a random intercept for Wave II disciplinary problems. Because odds ratios are easier to interpret than are logistic coefficients, we present odds ratios, rather than standardized logistic coefficients, for each model.

[a] White females served as the reference category for the race-ethnicity and gender dummy variables.

[b] 10th graders served as the reference category for the grade-level dummy variables.

[c] Teacher-bonding centered around the sample mean in both the main effects and interaction terms.

revealed three distinct levels of disciplinary problems. When sociodemographic background and earlier problems were controlled, African American boys had the highest rate, followed by (1) Hispanic American boys, white boys, and African American girls, who did not differ significantly from each other, and (2) Hispanic American and white girls, who did not differ significantly from each other. Analyses of interactions of the race-ethnicity and gender dummy variables with teacher-bonding revealed that the negative association between bonding and disciplinary problems was weaker for all groups than for white girls (see Model 2). Thus, all students were less likely to get in trouble in school when they had more positive views of teachers, but this was especially true of white girls.

The results that we have just described arose from a multilevel, or random-effects, framework, in which all sources of school-related variation in these two student outcomes were left uncontrolled. An alternative approach would be to estimate fixed-effects models that controlled for school location, essentially modeling within-school differences in these outcomes by within-school differences in teacher-bonding. To provide greater support for our findings, we reestimated our basic models with this fixed-effects framework. Because these comparative analyses revealed virtually no differences in results, we present the results for the random-effects models only.

To summarize up to this point, positive student-teacher relationships were associated with better student outcomes across the board, even after sociodemographic profile and prior behavior were controlled. Although even longitudinal analyses cannot discount the possibility of a spurious factor related to both teacher-bonding and improved behavior, these results, as well as the additional results from the fixed-effects models that ruled out the potential bias of omitted school-level variables, *suggest* that student-teacher bonding may be a protective resource. These processes, however, were not monolithic across the student population. Teacher-bonding was most closely related to the achievement of Hispanic American girls and the disciplinary problems of white girls. Thus, although we uncovered racial-ethnic variation in the role of intergenerational bonding, these findings did not consistently support our expectation that minority students, especially boys, would derive greater protection from such bonding.

Intergenerational Bonding Within the Institutional Context

Having examined the link between positive student-teacher relationships and two academic outcomes, we next investigated our second two research questions: Were positive student-teacher relationships associated with the structure, composition, and climate of the educational institutions in which students and teachers interacted, and did these associations between the institutional context and interpersonal relations differ across racial-ethnic groups? To explore these possibilities, we used multilevel modeling, in which individual students represented Level 1 and schools represented Level 2.

We began by estimating an unconditional model (with no predictors) in which the intercept, or mean level of teacher-bonding, was allowed to vary across schools. This model enabled us to determine the amount of variation in teacher-bonding that occurred among students within a school and among students in different schools. The intraclass correlation for bonding was .05, indicating that 5 percent of the observed variation in teacher-bonding occurred between schools and, therefore, could be explained by school-level factors. This finding was similar to those of past studies of school effects on academic behavior (see Phillips 1997). Since, by far, most of the variation in teacher-bonding occurred across individual students within the same schools, we estimated the degree to which the sample means of teacher-bonding in each school were reliable as indicators of the true school means (Bryk and Raudenbush 1992). The average school reliability was .72, indicating a reasonable level of reliability.

Table 5 presents the results of our full multilevel model. Beginning with the individual-level factors, teacher-bonding was the highest among adolescents with more-educated parents and those from two-parent families. Moreover, teacher-bonding appeared to peak in the 12th grade, which may reflect the greater likelihood of more-committed or higher-achieving students, who are more likely to bond with teachers, remaining in school until their senior year. As for racial-ethnic differences, we rotated the reference category for the racial-ethnic and gender groups to gauge the rank ordering of these groups for teacher-bonding: (1) Hispanic American girls; (2) Hispanic American and African American boys, who did not differ significantly from each other; and (3) African American girls and white boys, who did not differ significantly from each other. White girls fell somewhere between the first and second levels in this rank ordering and were not statistically significantly different from those in either level.

Table 5. Results from the Multilevel Model Predicting Wave I Teacher-Bonding

Variable	*b*	*SE*	β
Individual Level			
White male (WM)[a]	-.07***	.02	-.04
African American female (AF)	-.08*	.04	-.03
African American male (AM)	-.03	.04	.01
Hispanic American female (HF)	.07	.04	.03
Hispanic American male (HM)	-.01	.04	.00
Other racial-ethnic female (OF)	.08	.05	.02
Other racial-ethnic male (OM)	-.08+	.05	.02
Enrolled in 7th grade[b]	.07*	.03	.03
Enrolled in 8th grade	.02	.03	.01
Enrolled in 9th grade	-.06*	.02	-.03
Enrolled in 11th grade	.02	.02	.01
Enrolled in 12th grade	.20***	.05	.05
Parental education	.02***	.02	.05
Family structure (two-parent family)	.09***	.09	.06
Estimated verbal ability	.00	.00	.01
School Level[c]			
Sector (private school)	.10+	.06	.03
Estimated class size	.00	.00	.01
Students of own race-ethnicity (decile)	.01*	.00	.04
Estimated white teachers (decile)	-.01	.01	.02
Mean achievement (GPA)	.10	.08	.03
Mean parental education	-.06*	.02	-.06
Mean perceived safety	.20**	.06	.09
Intercept	3.56***	.04	—
n	10,991		

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

Note: All models contained a random intercept for Wave I teacher-bonding.

[a]White females served as the reference category for the racial-ethnic and gender dummy variables.

[b]10th graders served as the reference category for the grade-level dummy variables.

[c]All continuous school-level factors were centered around their sample means.

Turning to the institutional context, one of the two structural elements predicted teacher-bonding, although this association was only marginally significant. Students in private schools, but not those in schools with smaller classes, felt more positively about their teachers. One compositional element also predicted teacher-bonding. Students who attended schools with more students of their own race-ethnicity, but not those with more teachers of their own race-ethnicity, reported higher levels of bonding. Finally, two climate-related characteristics of schools predicted greater teacher-bonding. Although teacher-bonding was not greater in higher-performing schools, it was greater in safer schools (as perceived by the student body). In fact, school safety was the strongest school predictor of teacher-bonding (approximately one fourth of a standard deviation change in bonding with every unit increase in this factor). Mean parental education in the school also predicted teacher-bonding, but the direction of the association was unexpected. When viewed alone, mean parental education was positively associated with teacher-

bonding, but the direction of this association reversed when other school factors were included, indicating that the apparent benefits of attending schools with a more-educated parent population reflected other co-occurring school elements. This set of school factors explained approximately 40 percent of the between-school variance in teacher-bonding.

The findings thus far indicate that factors that are related to school structure, composition, and climate were associated with students' bonding with teachers. To investigate whether these associations varied by race-ethnicity, we extended our base multilevel model to include interaction terms between each race-ethnicity and gender dummy variable and each school-level variable. Because of the many possible interactions, we estimated a separate model for each of the three types of school factors and then a final model that included only the interactions that had been significant in at least one of these three separate models. Although the final model in Table 6 contains only the analyses with white girls as the comparison, we estimated this multilevel model repeatedly with each of the racial-ethnic and gender groups as the reference category. In our discussion of the multilevel patterns, we summarize across all models to give a complete picture of racial-ethnic variation in the link between institutional context and teacher-bonding.

Beginning with school structure, the association between school sector and teacher-bonding varied by race-ethnicity in one key way. This association was most strongly positive among Hispanic American girls, compared to all others.

Next, both composition elements interacted significantly with race-ethnicity and gender group to predict teacher-bonding. First, the association between teacher-bonding and the racial-ethnic composition of the student body was most strongly positive among Hispanic American girls, who, more than all other groups except Hispanic American boys, felt most positively about their teachers when they attended schools with a larger number of other Hispanic American students. This association was also slightly stronger for Hispanic American boys when compared to white girls but not when compared to any other group. Second, summarizing multiple models, the association between the proportion of whites on the teaching staff and teacher-bonding was positive for white students but negative for African American boys and girls and for Hispanic American girls. These latter groups, but not Hispanic American boys, tended to have less-positive views of their teachers when they attended schools in which more teachers were white.

Finally, only one of the three climate-related elements interacted significantly with race-ethnicity and gender group to predict teacher-bonding. Table 6 indicates that the positive association between teacher-bonding and the mean achievement level of the school was less strong for white boys than for white girls. Additional analyses, however, revealed a much more significant pattern. Compared to all groups except white girls, the teacher-bonding of Hispanic American girls was the most closely related to the achievement level of the school. Hispanic American girls had much more positive views of their teachers when they attended higher-performing schools.

To summarize, intergenerational bonding was not independent of the educational institution in which it occurred. Although we cannot rule out selection effects with our individual-level controls for student background, our analyses *suggest* that certain types of schools fostered student-teacher bonding. In general, the more diffuse aspects of schooling environments (e.g., climate) were more important than were the more concrete features of these environments. Furthermore, this connection between interpersonal and institutional context varied by race-ethnicity, especially among girls, although not always in the direction of stronger relationships for minority students.

CONCLUSION

Educational research has traditionally focused on the manifest functions of the educational system—instructing students, transferring knowledge, and developing skills. In recent decades, the more latent functions of the

Table 6. Partial Results from the Multilevel Model Predicting Wave I Teacher-Bonding with Cross-Level Interactions

Variable	*b*	*SE*
Main Effects[a]		
White male (WM)	-.09**	.03
African American female (AF)	-.10+	.06
African American male (AM)	-.09	.06
Hispanic American female (HF)	.12*	.05
Hispanic American male (HM)	.06	.06
Other racial-ethnic female (OF)	-.34	.35
Other racial-ethnic male (OM)	-.32	.31
Sector (private school)	.14*	.07
Estimated class size	.00	.00
Students of own race-ethnicity (decile)	-.01	.01
Estimated white teachers (decile)	.02	.02
Mean achievement (GPA)	.23**	.09
Mean parental education	-.05+	.02
Mean perceived safety	.22***	.06
Conditional Effects		
WM * sector	-.09	.07
BF * sector	-.23	.14
BM * sector	-.21	.15
HF * sector	.29*	.13
HM * sector	-.16	.15
OF * sector	-.27	.17
OM * sector	-.10	.12
WM * students of own ethnicity	.01	.01
BF * students of own ethnicity	.00	.02
BM * students of own ethnicity	.00	.02
HF * students of own ethnicity	.06**	.02
HM * students of own ethnicity	.04+	.02
OF * students of own ethnicity	-.07	.08
OM * students of own ethnicity	-.03	.07
WM * white teachers	.02	.02
BF * white teachers	-.03	.02
BM * white teachers	-.06*	.02
HF * white teachers	-.04	.02
HM * white teachers	.00	.02
OF * white teachers	-.03	.03
OM * white teachers	.00	.02
WM * mean achievement	-.37***	.08
BF * mean achievement	-.15	.15
BM * mean achievement	-.16	.16
HF * mean achievement	.16	.15
HM * mean achievement	-.15	.15
OF * mean achievement	-.29	.21
OM * mean achievement	-.10	.19
Intercept	3.55	.04
n	10,991	

*** $p < .001$, ** $p < .01$, * $p < .05$, + $p < .10$.

Note: All models contained a random intercept for Wave I teacher-bonding and controlled for grade level, parental education, family structure, estimated verbal ability, class size, school mean parental education, and school mean perceived safety. Because these models contain interaction terms, we did not include standardized coefficients.

[a] All continuous school-level factors were centered around their sample means.

educational system have received greater attention. As one example, nonacademic factors, such as interpersonal relations, shape academic adjustment. As another, schools organize interpersonal relations among peers and between young and old. Bringing these two themes together, schools can be viewed as important aspects of the ecology of human development—institutional settings influencing the more proximate contexts that, in turn, direct development. This study continued this increasingly prominent tradition of studying the social side of schooling. We did so in three key ways.

First, we chose to focus on social integration, rather than on alienation. In other words, we attempted to understand the implications of the presence, rather than the absence, of ties to others, in this case intergenerational bonds between students and teachers in school. Contrary to common depictions of an opposition between young and old in secondary school settings, adolescents and teachers did form positive, affective relationships. Moreover, these relationships played an important role in education that was on par with more commonly studied demographic factors. Across all groups, students who had more positive views of their teachers did better and had fewer problems in school, while those with more negative views did worse and had greater problems.

We should note two caveats to these findings. First, we cannot rule out the role of selection—better-behaved and higher-achieving students who are more inclined to bond with teachers—in these associations. Nevertheless, our analyses, which controlled for prior levels of academic behaviors and potential confounding factors and were replicated with alternative modeling strategies, revealed patterns that were at least consistent with the hypothesis that students derive some protection from intergenerational bonding in school and that, alternatively, intergenerational distance may be costly. Second, a small portion of our sample switched schools (primarily middle school to high school) during the course of the study. Although these students were still followed up, their assessments of teachers might have been based on a different school than their achievement and disciplinary assessments. In these cases, therefore, our models predicting a change in behavior between schools by assessments of teachers in one school essentially tap the academic trajectories of students with certain teacher orientations.

Therefore, when they study alienation or the role of interpersonal resources in academic functioning and more general development, researchers should pursue a broader model, in which other social ties are included in addition to the parental and peer focus that dominates this type of research. One way to do so is to study how student-teacher relationships overlap and interact with relationships with parents and peers. Do good relationships with teachers reinforce home-school partnerships? How may positive relationships with teachers influence friendship associations? Research should also delve more deeply into student-teacher relationships themselves, exploring the connection between the affective dimensions of such relationships and other behaviors of teachers, long-term trajectories in the multiple dimensions of these relationships, and the importance of relationships with specific teachers (as opposed to more general views of teachers) as turning points in educational and behavioral trajectories.

Second, we approached social integration from a multilevel perspective, specifically, the intersection of the interpersonal and institutional. Interpersonal relations, within or across generations, do not occur, and are not maintained, at random, but are related to the environment in which people come together. In this case, intergenerational bonds in school were related to the characteristics of the school setting in which they occurred. Again, we cannot rule out the possibility of selection effects, although future research may investigate selection more closely by examining changes in teacher-bonding that are demonstrated by the adolescents who switched schools between the first two waves of Add Health. Still, our findings identified certain types of schools in which such bonding was higher. In general, student-teacher relationships were more positive in private schools, schools where students felt secure, and schools in which the students were more like

the rest of the student body in terms of race-ethnicity.

These findings provide insights into the social psychology of relationship formation and education, but do they have more practical implications? We argue that they do. Such findings identify potential trouble spots. Is intergenerational bonding or students' alienation more prevalent in certain environments? If so, educators may need to attend to this issue more in these schools. In other words, the solution would not be to channel students to schools that appear to foster closer relationships between youths and adults (e.g., private or segregated schools) but to make extra efforts to facilitate positive intergenerational bonding in schools where these relationships may be more problematic. Identifying schools that are high in intergenerational bonding across all students (e.g., all students are responding to the same set of teachers similarly) is the first step toward identifying the conditions that foster such ties. Future research can build on our work by exploring the mechanisms by which school factors influence relationships. Knowledge of more proximate causes can then be applied to schools in which student-teacher dynamics need improvement. This process mirrors research on Catholic schools (see Coleman and Hoffer 1987), in which the discovery of Catholic school effects on achievement was followed by an investigation of the normative features of these schools that explained such effects and the exploration of whether such features could benefit the public sector.

Third, we approached social integration with an eye toward the diversity of the student population. In the past, many social issues have been treated as monolithic across populations or unique to one population, but the exploration of variation in processes across populations is an important avenue to gaining general knowledge about social problems, including social inequality. Our focus on racial-ethnic diversity was a logical extension of our interest in alienation, given concerns about the alienation of minority students. We speculated that African American and Hispanic American youths would benefit most from intergenerational bonding in school and from certain school environments.

This functional substitution hypothesis was consistently, although not uniformly, supported only for Hispanic American girls. Although all students appeared to derive protection from student-teacher relationships, if we can consider the positive association between teacher-bonding and academic achievement to be indicative of protection, this protection was the greatest among Hispanic American girls. More than other groups, these girls' connections with teachers also fluctuated across different institutional contexts, typically with better relationships apparent in more socially or interpersonally advantaged schooling environments. Thus, to some extent, Hispanic American girls appeared to "get more" from positive interpersonal relations or environments. Why would this same pattern not extend to Hispanic American boys or other minority youths?

Although Hispanic American adolescents are typically close to their families, their parents, some of whom are recent immigrants with language difficulties, are likely to be less knowledgeable about the way American education works than are parents of racial-ethnic minority groups with lower rates of immigration. Consequently, teachers may become the vital source of information about schooling in this population, so that affective ties to teachers complement the role of close family ties in ways that they do not for African American families, who typically have more experience with the educational system, as well as greater feelings of mistrust and even hostility toward the system (Lareau and Horvat 1999). At the same time, the cultural distance between Hispanic American communities, especially those with a high proportion of immigrants, and schools may create a level of discomfort among Hispanic American students that influences their orientation to school. Therefore, factors that increase comfort and feelings of belonging, such as racial-ethnic matching with students and teachers, may facilitate in-school relationships in general. Yet, because Hispanic American girls are typically more closely bound to their families than are Hispanic American boys, and girls in general tend to have superior interpersonal skills (Fagot 1994; Valenzuela and Dornbusch 1994), this home-school dynamic may trans-

late into advantages for Hispanic American girls more than for Hispanic American boys.

Beyond this distinct pattern for Hispanic American girls, our focus on racial-ethnic variation revealed other interesting findings. For example, intergenerational bonding was most closely related to disciplinary action among whites girls. Since whites are the most advantaged population and girls are the most successful students in American education, white girls may have less to gain academically from close ties to their teachers. What they gain could be someone to intervene for them if they have nonacademic problems in school. This possibility could be tested by examining whether the association between in-school problem behavior and disciplinary action is weaker among white girls than among other students.

Another interesting pattern involved the race-ethnicity of the teaching staff. Minority students liked the teachers in their schools less when the teaching staff was predominantly white. As has been found in the past, therefore, racial-ethnic discrepancies can block intergenerational bonding in school (Alexander et al. 1987), an especially relevant problem today in a national climate in which the increasing racial-ethnic diversity of American students is not matched by a similar trend among American teachers. Finally, minority boys seemed to be the most at risk of alienation in school, a pattern that echoes wider concerns about this population in both public and scholarly discourse (Stanton-Salazar 2001). We argue that these findings demonstrate the need to break up racial-ethnic populations into gender groups in studies of alienation, oppositional culture, and related phenomena, as well as the value of integrating intergenerational, as opposed to just peer, relations into these conceptual models that are aimed at explaining the problems that minority boys have in school.

By exploring this racial-ethnic diversity, we have, in a sense, added another level to our conceptual model—the intersection of interpersonal and institutional contexts within the social structural context. In other words, this intersection varies by social structural location. To explore this variability further, research can examine other structural elements. For example, our expectations for racial-ethnic variation were based on reasoning (e.g., resources matter more for disadvantaged groups) that could also relate to differences in process by socioeconomic status. Thus, the nexus of gender, race-ethnicity, and social class may create unique spaces that determine the value of positive social relations or social environments. Such investigations will deepen our understanding of the complex makeup of the social ecology of adolescence.

Throughout this discussion, we have suggested avenues of future research that could shed new light on our specific topic, as well as on related issues. The third wave of Add Health will help to pursue these avenues. These new data will encompass the transition to adulthood and allow the modeling of relationship trajectories, the long-term consequences of adolescent relationships and other forms of bonding, and the potential cumulative effects of early academic and behavioral problems. At the same time, these waves will include complete high school transcripts for all the respondents, which will allow a much more nuanced depiction of institutional context and the exploration of whether different student groups, in effect, attend different schools within the same institution. Recall that although our between-school focus was a key innovation of this study, only 5 percent of the variance in teacher-bonding occurred between schools. Perhaps the limitation of this approach was that it did not target the right "level" (e.g., track, network, or curriculum, rather than school). The new Add Health data will allow us to examine *between-group* differences *within* schools, rather than simply to look at between-school differences.

The execution and findings of this study are relevant for policy and for the study of educational issues in general. The findings provide information that may be useful for dealing with, and intervening for, a variety of students who may be at risk of becoming alienated or disengaged in secondary school. Like past research, we have shown how interpersonal relationships are an important resource in school, but we recognize that relationships are difficult to manipulate by policy or programs. Consequently, we have attempted to identify

the characteristics of schools that appear to facilitate the interpersonal relations that may be important for keeping students tied into and committed to the educational process and to more conventional pathways. Since school structure; composition; and, to a lesser extent, climate are more amenable to policy, these findings may have more practical applications. Moreover, our focus on the social side of the educational process emphasizes the need to take more ecological considerations of education, and our examination of the intersection of interpersonal and institutional contexts suggests a framework for doing so.

APPENDIX

Descriptions of the Study Variables

Variables	Description Mean	(*SD*)
Individual and Family		
Grade level	Students reported the grade level in school in which they were enrolled (or, if summer, what grade they had just completed) during the Wave I In-Home Interview (range = 7th–12th grades). These reports were recoded into a set of dummy variables.	9.34 (1.47)
Parental education[a]	Mean of adolescent-reported years of schooling for residential mother and father, if both present, or for the reporting parent in single-parent families (1 = 8th grade or less, 2 = more than 8th grade but less than high school graduation, 3 = vocational training, 4 = high school graduation or equivalency, 5 = post-high school vocational training, 6 = some college education, 7 = college graduation, 8 = post-college education).	4.90 (1.88)
Family structure (two parent)	Adolescent-reported household rosters used to identify family structure (1 = two married, biological parents in home, 0 = any other family type, including stepfamilies and single-parent families).	.53 (.50)
Estimated verbal ability	Student's score, in percentiles, on Add Health Picture Vocabulary Test.	49.41 (27.91)
School Level		
Sector (private school)	School administrator indicated the school sector (1 = private, 0 = other).	.07 (.26)
Estimated class size	School administrator estimated the average number of pupils per classroom in school.	26.62 (5.82)
Students of own race-ethnicity (decile)	Racial-ethnic frequencies for each school, based on In-School Survey, matched to respondent's self-reported race-ethnicity. Divided by 10 for ease of interpretation.	5.57 (3.05)

continued

APPENDIX continued

Estimated white teachers (decile)	Estimation by school administrators of percentage of teachers from the main racial-ethnic groups. Divided by 10 for ease of interpretation.	7.95 (2.47)
Mean achievement (GPA)	Within-school mean of students' reports of their grade point averages, based on the full sample from the In-School Survey.	2.80 (.24)
Mean parental education	Within-school mean of students' reports of parental education (see above), based on the full sample from the In-School Survey. Conventional means for gauging school SES, such as the percentage of the student body who were eligible for free lunch programs, were not available in Add Health.	4.65 (.73)
Mean perceived safety	Within-school means of students' reports of whether they felt safe in school (1 = strongly disagree to 5 = strongly agree), based on the full sample from the In-School Survey.	3.70 (.33)
n		13,570

[a] A parent-reported measure of parental education was available for a subsample of Add Health respondents. A comparison of the models with each of these two types of parental education measure revealed no meaningful difference in the results. On the basis of these comparisons, we chose to use the adolescent-reported measure to retain more cases.

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