Problems at Home, Peer Networks at School, and the Social Integration of Adolescents

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Abstract

Research and theory in sociology, developmental psychology, and neuroscience suggests that the kinds of relationships that adolescents have at home will matter to the social experiences that they have in high school. To explore these potential connections between two key contexts of adolescent life, we applied a several statistical techniques to network and survey data from 16 high schools in a nationally representative sample of adolescents. In general, adolescents who had negative relationships with their parents were less likely to feel socially integrated with peers at school. This general association did not vary by whether adolescents' network positions indicated that they were popular but was more pronounced among adolescents with high sociability ratings (i.e., adolescents who nominated multiple peers as their friends). Some evidence also suggested that homophilous relationships between adolescents who each had negative relationships were somewhat durable over time, although this durability appeared to be more about the larger structure of the school-wide peer networks that pushed homophilous adolescents together and less about homophily itself. Overall, the results indicate that relationships with parents were not consistently implicated in peer dynamics at school, but, when relationships in the home and school were connected, they often pointed to social risks for adolescents with problems at home.

Families and schools represent two of the major settings of adolescent life. They often seem like distinct settings—physically separate, of course, but also psychologically separate, as young people exit home and then spend the day separate from parents at school before leaving school behind to return to their families (Parcel, Dufur, and Zito 2010; Schneider and Coleman 1993). Social and behavioral scientists often magnify this perceived distinctness by conceptualizing these two settings in different ways and studying them separately from each other. The family is typically viewed as an intimate context of interpersonal processes (e.g., communication, interaction) that are difficult or inappropriate to manipulate from the outside and evaluated in terms of social psychological qualities, while the school is typically viewed as an institutional context of organizational processes (e.g., pedagogy, curriculum) that are subject to external manipulation through policy and evaluated in terms of more concrete markers of performance. This distinctness in public and scholarly discourse belies the interconnected nature of families and schools. Not only do the same interpersonal dynamics that make families what they are also characterize the developmental contexts found in schools, families and schools influence each other in complex ways that need to be better understood (Crosnoe 2004).

The purpose of this study is to explore this interconnectedness between the interpersonal processes of families and schools by examining the degree to which parent-adolescent relations at home have implications for adolescent-peer relations at school. Integrating insights from psychology, sociology, and neuroscience, it asks: Are adolescents who are alienated from parents at risk of feeling socially marginalized at school, and what is the nature of their social relationships that would make them feel that way? To answer these questions, we apply a range of analytical techniques (including stochastic actor based longitudinal social network modeling) applied to complete network data in the 16 saturated schools in the National Longitudinal Study

of Adolescent Health (Add Health). Beyond answering these specific developmental questions, this research bridges several disciplinary lines, illustrates core theoretical concepts (e.g., ecological mesosystems), and shows how to capture the nesting of social relations while improving causal inference.

Schools as Educational Institutions and Social Contexts

Educational experiences affect the life course. These effects go beyond the role of academic credentials and skill development in long-term socioeconomic attainment. Where a young people go to school and what happens in those schools shapes their social psychological development, which then affects how they transition into and though adulthood (Alexander, Entwisle, and Olson 2014; Wells 2010; Eccles and Barber 1999).

In the particular case of high schools, these developmental effects are rooted in the peer environment organized by high schools when they bring together many young people for long periods of time in an academically (and often racially and socioeconomically) stratified space. The peers that adolescents are exposed to and they interactions they have with these peers in and around the school over time structure identity development and sense of self, provide resources for coping, present challenges to overcome, socialize into world view, set the opportunity structure for behavioral experimentation, and facilitate individuate from parents (Crosnoe, 2011). Thus, how high school shapes the future is not just about classes and test scores but also about the climate of the peer culture and how adolescents are integrated into it.

Connecting Schools to Families

High schools do not operate in vacuum. They are part of a developmental ecological consisting of many other contexts in which young people live their lives. In many ways, the school and the family are the most critical of these contexts during the early life course, as they

are the settings in which young people spend the most time and that so powerfully shape their current experiences and future prospects (Parcel et al. 2010; Crosnoe 2004). In ecological terms (see Bronfenbrenner & Morris, 2001), the family may operate alongside the school with parallel but largely independent influences on the adolescent (the microsystem), or the family's influences on adolescents may be intricately tangled up with the influences of the high school (the mesosystem).

In one example of such mesosystem influences, what is happening in one of these contexts shapes what is happening in the other, which then influences the adolescent. Traditionally, the most common way that scholars have viewed such a connection between families and schools was as a direct path through parents' active or passive choice of where their adolescents attend school. Parents actively select a high school for adolescents, or adolescents are passively selected into a high school through such parental factors as socioeconomic status. In both ways, the parent affects the peer environment to which the adolescent will be exposed, given that the high school is the primary setting of peer life (MacFarland and Pals 2005; Milner 2004; Moody and White 2003; Coleman 1961). This direct path is in line with Harris' controversial argument (1998) that the only lasting effects parents have on the kinds of adults their children will turn out to be is through their power to influence peer exposure, primarily through school selection.

Another way to consider this mesosystem connection between families and schools is to go deeper into parent-adolescent relationship. Parenting processes shape who adolescents are and the competencies and capacities that they take into the peer world that make them accepted or rejected, sociable or withdrawn, leaders or followers. Thus, how parents parent has implications for how adolescents interact with, engage in, and perceive the peer contexts that

they encounter at the schools into which their parents have selected them (Giordano 2003; Bronfenbrenner 1986).

A Focus on Problems in Both Contexts

Take, for example, the potential implications for positive peer relations at school of experiencing negative relations with parents, such as adolescents who are disconnected from their parents through conflict or alienation. What will their social lives at school be like? Theory and research from multiple disciplines suggest that, rather than finding social support at school that they lack at home, such adolescents may struggle socially at school. Sociological and developmental perspectives emphasize the overlap in the social psychological experience at home and school and how experiences in one set the stage for experiences in the other. The argument is that problems at home will interfere with development of the social competencies and capacities that are necessary to navigating the peer world successfully, such as confidence, agreeableness, and perspective-taking (Crosnoe 2011; Giordano 2003; Collins et al. 2009). For example, secure attachments with parents facilitate the social and emotional skills that allow adolescents to form close relationships with peers (Schneider, Atkinson, & Tardif, 2001).

Developmental neuroscience suggests the same outcome but emphasizes different pathways. In short, negative relationships with parents can shape brain development in critical ways that blunt the sensitivity of adolescents to their peer relations. For example, a series of studies by Dahl and colleagues linked parent-adolescent discussion tasks to virtual peer interaction games while scanning adolescents' brains with fMRI (functional magnetic resonance imaging). The affective networks of adolescents' brains, such as the lentiform nucleus, were more active than their cognitive control networks, such as the dorsolateral prefrontal cortex, when adolescents experienced negativity from mothers. When interacting with peers in more

positive ways, these same adolescents then demonstrated reduced activity in the parts of their brains that organize emotional responses to social stimuli, such as the bilateral amygdala. These findings suggest that the brain rewires in response to family negativity to protect adolescents' from that emotional and psychological threat, but this protective response desensitizes them too generally, so that they are less reactive to even the positive aspects of peer relations (Lee et al. 2015; Tan et al. 2014). As a result, adolescents with problems at home may derive less benefit from peer relations even though they need these social and emotional benefits the most.

Connecting these different disciplinary insights, adolescents who have problematic relationships with parents at home may be less embedded in and sensitive to peer relations at school, so that they are less motivated to engage with peers and less reactive to them in positive and negative ways. A consequence of home life, therefore, would by marginalization at school.

Study Hypotheses

Based on this integration of diverse perspectives on connections between adolescents' home and school lives, we pose two sets of hypotheses. The first hypothesis is that adolescents with problems at home will be less likely to feel socially integrated at school, both when they are isolated and when they objectively seem to be connected to others. The idea here is that their feelings of integration will be less reactive to their social resources at school. The second hypothesis is that adolescents with problems at home will cluster together—through homophily or from lack of other alternatives—in at school. If so, the expected weaker link between having friends at school and feeling socially integrated at school among adolescents with problems at home may be due to the fact that their friends come into these relationships with similar interpersonal disadvantages.

Methods

Data and Sample

Add Health is a nationally representative survey that launched in 1994 and has followed adolescents into adulthood over the next two decades (Harris et al. 2009). The schools included in the study were randomly selected through a sampling frame stratified by region, urbanicity, school size, school type, and racial composition based. Data collection began with an In-School Survey in 1994 with all 90,118 7-12th graders in the 132 middle and high schools selected for the sample. This census like survey was then used to generate a nationally representative subsample of 20,745 students selected across schools by gender and grade. This sample group then completed an In-Home Interview in 1995 (Wave I), 1996 (Wave II), 2001-2002 (Wave III), and 2007-2008 (Wave IV). Add Health designated 16 schools as *saturated*, meaning that all students, rather than a random sample, participated in the In-Home Interviews.

The analytical sample for this study included adolescents who attended one of the 16 saturated schools, and given our interest in adolescence and high school, who participated in the In-School Survey and the Waves I-II In-Home Interviews. Restricting the analytical sample to adolescents who participated in Waves I and II necessarily excluded the Wave I high school seniors, who were purposely dropped from the core sampling frame in Wave II by Add Health investigators before being added back in later waves. This final sample included 2,699 adolescents. Missing data within this sample were estimated through multiple imputation techniques, as described below, and we employed longitudinal sampling weights to account for study design effects and to address differential attrition from the core sample across waves.

Measures

Table 1 presents the univariate descriptive statistics for all variables included in analyses.

Feelings of fitting in at school. Drawing on earlier work with Add Health (Crosnoe 2011), we created a scale with five variables from the Waves I-II In-Home Interviews. Adolescents reported how much they got along with other students, felt close to people at their school, and felt like they were part of their school, felt socially accepted, and felt loved and wanted. Their responses were dichotomized to indicate that the adolescent felt accepted, felt wanted, had no trouble with other students, felt close to other students, and/or felt part of the school. These binary variables were summed to create a scale ranging from 0-5, where higher values represent more perceived integration.

Friendship network. During the In-School Survey, adolescents nominated up to five female and five male friends. These nominations can be used to create multiple individual-level and school-level measures that capture the friendship network and the standing of the adolescent within it. In some models, the presence of a friendship tie (and its continuation over time) served as the outcome of interest. In other models, adolescents' in-degree nominations (number of friends nominated by them, gauging sociability) and their out-degree nominations (number of friends who nominate them, gauging popularity) were used as key independent variables.

Negative relationships with parents. In Wave I, respondents were asked to agree or disagree with the statement that, "most of the time your mother [and father] is warm and loving toward you." Responses were coded such that higher values represented stronger agreement with the statement (1 = strongly agree; 2 = agree; 3 = neither agree nor disagree; 4 = disagree; 5 = strongly disagree) for both parents, separately.

Sociodemographic covariates. A set of characteristics was measured to account for sociodemographic variability and important spurious factors: gender (1 = female), age at Wave I, parent education (highest level among any residential parents; 1 = less than high school, 2 = high

school graduate, 3 = some post-secondary education, 4 = college graduate, 5 = post-graduate degree), family structure at Wave I (1 = lives with both biological parents, 0 = other family form), and race/ethnicity (dummy variables for non-Hispanic White, non-Hispanic Black, Hispanic, non-Hispanic Asian, and other/multi-racial).

Analytical Strategy

The first hypotheses considered the links among adolescents' relationships with parents, their sociometric positions in their peer networks, and their perceived social integration. This hypothesis called for individual-level analyses. We estimated a series of models regressing the feelings of fitting in scale on the focal parenting factors (negative relationships with mothers and fathers) and the covariates and then added interactions between the parenting and network variables. Because the fitting in scale was measured at both Waves I and II, we employed a lagged modeling structure in which the Wave II scale was the dependent variable and the Wave I scale was a covariate, effectively modeling changes in not fitting in over time.

These individual-level analyses were performed in STATA. As already mentioned, missing data were accounted for with multiple imputation, which estimated missing values for all adolescents based on simulated versions of the sample. The STATA suite of *mi* commands created five imputed data sets and then averaged results across these data sets for final estimates.

The second hypothesis concerned homophily between adolescents based on their relationships with parents. This aim calls for a dyadic-level analysis within the context of the full network in each school. The Simulation Investigation for Empirical Network Analysis (SIENA) model estimates changes in the friendship network over time and how such changes are predicted by focal factors (Snijders, 1996). Coefficients are calculated using a method of moments estimator summarizing changes in the network statistics between observations

combined with an agent-based simulation model that updates the parameters, estimates uncertainties, and provides an actor-based interpretational framework. The simulation model decomposes network changes into a series of the smallest possible transitions in one tie at a time for a randomly chosen focal adolescent. Here, we estimate changes in friendship networks with ties possible among all adolescents in a school, using the parenting of adolescents as predictors of any changes in ties. The models also take into account the reverse path in which friendship ties could theoretically predict changes in the quality of parent-adolescent relationships.

In the SIENA models, the *alter*, *ego*, and *ego-alter interaction* effects are selection mechanisms central to understanding how parent-adolescent relationships is related to popularity (alter; number of friendship nominations received), sociability (ego; number of nominations made), and homophilous selection (ego-alter). These effects can refer to a creation process, in which a friendship that does not exist at one wave forms by the next wave (as opposed to not), as well as a continuation process, in which a friendship persists across waves (as opposed to dissolving). Additional parameters include structural effects for reciprocity and transitive network closure (e.g., transitive triplets: $i \rightarrow k$ become friends when $i \rightarrow j \rightarrow k$).

Results

Only 11% of adolescents in the 16 schools did not agree that their mothers were warm and loving, with the proportion rising to 19% for fathers. When comparing the extremes (strongly agree vs. strongly disagree), some differences in the network positions of adolescents with good and poor relationships with parents are evident, although not consistent. Comparisons of mean number of peer nominations in the network data suggest a social advantage for having bad relationships with mothers (mean number of times nominated: 4.86, mean number of

nominations made: 5.00) over having good relationships with mothers (4.49, 4.69). Yet, adolescents with bad relationships with fathers were at a social disadvantage (2.72, 3.41) compared to those with good relationships with their fathers (4.40, 4.54). These patterns should be viewed with caution, however, because the overall correlation between the two parent variables (mother, father) and the two peer variables (in-degree, out-degree) were all weak, typically .10 or below. Moreover, the parent variables were not associated with either peer variable once the covariates were taken into account.

Testing Hypothesis 1

The results for the individual-level analyses of feelings of fitting in at school are presented in Table 2. The significant coefficients for both of the parent variables suggest a tendency for adolescents with more negative relationships with parents to have fewer feelings of fitting in at school, net of Wave I feelings; in other words, more perceived social marginalization from year to year. This association was slightly stronger for negative relationships with fathers (each point increase on this variable was associated with a 12% standard deviation reduction on the feelings of fitting in at school scale) than for negative relationships with mothers (10%). The difference between having the best and worst relationship with fathers equaled 40% of a standard deviation on the feelings of fitting in scale.

A second set of models added interactions between each parent variable and each peer network variables as predictors of the Wave II feelings of fitting in scale. The parent variables did not interact with the out-degree peer variables. In other words, the inverse association between negative relationships with mothers and feelings of fitting in at school did not vary as a function of how popular adolescents were—adolescents got no interpersonal boost from having others nominate them as friends).

Negative relationships with parents did interact with out-degree peer nominations (i.e., the number of others adolescents nominated as friends). For interpretation, we graphed the predicted score on the Wave II feelings of fitting in scale for youth with different combinations between relationships with parents (strongly agreed and disagreed with the statement about parents being warm and loving) and out-degree peer nominations (nominated above- and below-average number of friends for the sample). Figure 1 graphs these predicted values for relationships with mothers.

The inverse association between negative relationships with mothers and feelings of fitting in at school did vary as a function of how sociable adolescents were, such that the gap in feelings of fitting at school in between youth with positive and negative relationships with their mothers was greater among the most sociable. Thus, if adolescents had negative relationships with mothers, they were more likely to claim lots of friends while not feeling socially integrated.

These results provide partial support for the first hypothesis. Adolescents with more negative relationships with parents tended to feel more marginalized and derive less social psychological benefit from seemingly positive network positions.

Testing Hypothesis 2

The second hypothesis involved dyadic-level modeling, and so we turned to SIENA, which captures stability/change in networks over time and has several important features, such as allowing for dynamic friendship patterns (friendship creation and/or continuation and controlling for a range of network dependencies (such as reciprocation and mutual friends, which are features of networks that can affect the likelihood of friendship ties). A downside of this powerful method is that it could only be supported in the two high schools in the saturated school

sample with near-complete network data: Sunshine, a large and predominantly White high school, and Jefferson, a moderately sized and predominantly minority high school.

Table 3 presents the partial results of the model for featuring negative relationships with mothers as the focal factor. It revealed that adolescents who had negative relationships with their mothers were no more or less likely than other adolescents to be nominated as friends (alter) or to nominate friends (ego) in either high school. The only instance of homophily concerned continuation in Sunshine. In this high school, adolescents who had negative relationships with their mothers were no more or less likely than any two other adolescents to become friends (creation), but they were significantly more likely to maintain a friendship over time once they formed it. This significant homophily pattern, however, was reduced to non-significance by the inclusion of the network dependency variables.

The dyadic analyses, therefore, provided only limited support for the hypothesis about homophily between adolescents with negative relationships with their parents. We found only one example of such homophily, and it appeared to be more about the larger network in which the two adolescents came together.

Conclusion

Overall, we cannot say that the link between problems at home and the social outcomes of high school students was a strong one. When we did see some evidence of such a link and explored it, however, it did usually suggest some possible spillover between home and school.

If adolescents felt alienated from or rejected by parents, they were less likely to feel socially integrated at school. This spillover appeared to worse when they thought that they had friends at school, suggesting a possible "alone in the crowd" effect (see Crosnoe 2011) in which

they were seemingly connected to others but felt disconnected. One possible reason that they felt this way might have been that those other adolescents who appeared to be their most enduring friends also had problems at home. To the extent that adolescents with problems at home may have fewer social resources to bring into their friendships, the friendships that form between two such adolescents might not be as socially integrating. They might have less to give each other.

If the developmental neuroscience evidence suggesting a link between maternal negativity and adolescents' blunted sensitivity to peer relations is right, then we should expect to see less pronounced effects of problems with parents on having friends or the number of friends (a quantity metric) and more pronounced effects on the substance of any friendships that do form and last (a quality metric). The next step in this research, therefore, is to see how the continuation of friendships between adolescents who each have problems at home factors into perceived social integration/marginalization of both adolescents at school. Add Health allows such an examination, but the truth is that this valuable data set is getting old. The young people were in high school two decades ago. A new Add Health—with its pioneering longitudinal network design—needs to be fielded. Such a future endeavor could also correct some of the substantive limitations of Add Health, such as the fact that it is far more useful for mapping out networks of relationships than for exploring the interpersonal and affective processes going on inside these relationships.

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Table 1. Univariate descriptive statistics (n = 2,699).

	Mean (SE)/ %	
Feelings of fitting in at school		
Wave I	3.91	(1.239)
Wave II	3.98	(1.194)
Friendship network		
In-degree nominations	4.243	(3.499)
Out-degree nominations	4.267	(2.979)
Negative Relationships with Parents	4.322	(0.827)
Mother		
Strongly agree	48.76%	
Agree	40.12%	
Neither agree/disagree	6.99%	
Disagree	2.83%	
Strongly disagree	1.30%	
Father		
Strongly agree	37.66%	
Agree	42.56%	
Neither agree/disagree	12.63%	
Disagree	4.85%	
Strongly disagree	2.31%	
Covariates		
Gender (female)	49.94%	
Age	16.258	(1.471)
Parent education		
Less than high school	12.54%	
High school	31.63%	
Some post-secondary	22.16%	
College graduate	23.43%	
Post-graduate degree	10.23%	
Two-biological parent household	27.83%	
Race/ethnicity		
Non-Hispanic white	49.57%	
Non-Hispanic black	14.66%	
Hispanic	19.51%	
Non-Hispanic Asian	13.81%	
Other/ multi-racial	2.33%	

Table 2. Results from regression models predicting feelings of not fitting in at school at Wave II by parental relationships

	b Coefficient (SE)			
	Model 1		Model 2	
Mother not warm and loving	-0.109	*		
	(0.053)			
Father not warm and loving			-0.125	**
			(0.045)	
Feelings of fitting in at school (Wave I)	0.394	***	0.389	***
	(0.039)		(0.039)	
Covariates				
Gender (female)	-0.056		-0.065	
	(0.067)		(0.067)	
Age	-0.017		-0.014	
	(0.020)		(0.020)	
Parent education	-0.046		-0.048	
	(0.029)		(0.030)	
Two-biological parent household	-0.018		-0.030	
	(0.069)		(0.069)	
Race/ethnicity				
Non-Hispanic black	-0.237	*	-0.239	*
	(0.117)		(0.116)	
Hispanic	-0.022		-0.009	
	(0.120)		(0.122)	
Non-Hispanic Asian	-0.217		-0.212	
	(0.153)		(0.152)	
Other/ multi-racial	0.343	*	0.371	*
	(0.154)		(0.157)	
Constant	3.162	***	3.186	***
	(0.404)		(0.408)	

Note: n = 2,701; † $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Table 3. Partial Results from SIENA Models Predicting Changes in Friendship Ties between Waves I and II by the Parental Relationships of Adolescents

	b Coefficient (SE)	
	Sunshine	Jefferson
Negative relationship with parent (alter effect)	.01	.00
Negative relationship with parent (ego effect)	-.03	.01
Similar relationships with parents (creation)	-.56	-.66
Similar relationships with parents (continuation)	.82***	-.77

*** $p < .001$

Figure 1. Adolescents' Feelings of Fitting In at School, by Relationships with Mothers and Number of Friends Nominated by the Adolescents