Parent Engagement in Science With Ninth Graders and With Students in Higher Grades

Lee Shumow and Jennifer A. Schmidt

Abstract

By high school, parent engagement is likely to differ not only by grade, but by subject. This study surveyed students enrolled in high school science classes and found that parents of freshmen (9th graders) are more involved at home, less involved at school, and equally involved in educational planning compared to parents of high school students in higher grades. There were some differences in which background factors predicted parent engagement with freshmen and with older high school students. Overall, parent engagement contributed to students' motivation and performance in science. Controlling for background characteristics, parent engagement at home contributed to students' perceptions of their skill and their academic grades differently for ninth graders than for students in higher grades. Parent engagement at school contributed to ninth graders' valuing of what they were learning in science class but did not impact students in higher grades.

Key Words: parents, engagement, science, ninth grade transition, freshmen, high school students, home, schools, motivation, achievement, family

Introduction

Little comparative work has been done by grade level about how parents are engaged with school and with what consequences. For high school students, parental engagement is likely to be very important during the freshman

year because 9th grade is a critical juncture in education. Parent engagement is likely to differ not only by grade, but by subject. Our prior study established that parent engagement was an important factor in predicting high school students' adjustment in their science classes and differed by type of engagement (Shumow, Lyutykh, & Schmidt, 2011). This study focuses on students enrolled in high school science classes and extends the prior study to answer several research questions. The first question was: Are parents of freshmen engaged to the same extent as parents of older high school students in three specific dimensions of parent engagement (at home, at school, and educational planning)? The second question was: What background characteristics predict parent engagement with freshmen and with older high school students? The final question addressed was: Controlling for background characteristics, does parent engagement contribute to academic adjustment differently for freshmen than for older high school students?

The Ninth Grade Transition

The transition to high school is particularly difficult for students (Barber & Olsen, 2004). More students fail and are held back in ninth grade than in any other grade—as many as 40% in some districts (Wheelock & Miao, 2005). Ninth grade is associated with declines in school engagement (Seidman, Aber, Allen, & French, 1996), grades (Benner & Graham, 2009), orientation to school (Benner & Graham, 2009; Isakson & Jarvis, 1999), and psychological well-being (Newman et al., 2007). In recent research in science classrooms, ninth graders reported lower engagement, lower skill, and lower self-esteem in class compared with older high school students (Schmidt & Shumow, 2011). Students who struggle during the high school transition are at risk for continuing academic difficulties (EPE Research Center, 2006; Lee, Bryk, & Smith, 1993).

There are many possible ways to address the problems students often encounter in ninth grade in order to improve student outcomes. Although practitioner-oriented guides for improving the transition often suggest that educators engage parents in supporting their children's transition to high school, that advice is rarely predicated on research and tends to be vague advice about involving parents without enough detail to be very useful. Parents are also aware of and concerned about their children's transition and adjustment to ninth grade (Akos & Galassi, 2004). Our goal is to provide empirical information about parent engagement during high school that will help educators and parents make decisions about when and where they might best concentrate their partnership efforts to support students' success.

Parent Engagement

Drawing on ecological systems and stage environment fit theories (Bronfenbrenner, 2005; Eccles, 2007), we expect that parent engagement will be particularly important for freshmen. Parent engagement is a widely recognized contributor to adolescent school success (Eccles, 2007). Yet, there is little information about parent engagement during ninth grade and whether and how it might differ between ninth and older grades. A previous study (Shumow et al., 2011) suggested that parents of freshmen are more engaged at home but less engaged at school. This study investigates and directly compares engagement among parents of freshmen and older high school students. We examine student reports of their parents' engagement at home, at school, and in educational planning, with an eye towards identifying what types of involvement might be targeted to improve particular student outcomes at different points in high school.

Parent Engagement at Home

Parent engagement at home includes help with and monitoring of homework as well as establishing rules and routines conducive to school success. Generally, homework expectations increase in ninth grade. Parents of freshmen likely respond to those increased expectations with greater involvement but may then withdraw somewhat as students move to higher grades.

Parent Engagement at School

Engagement at school includes interaction with teachers, volunteering, and attending events (Hill & Craft, 2003). At-school parent engagement tends to decrease across students' educational careers, which is a concern because it is highly related to student grades (Jeynes, 2005; Shumow & Miller, 2001). Because the high school is typically large and bureaucratic and thus trickier to navigate than elementary or middle schools, parents of freshmen might not come to the high school as often as parents who have had time to "learn the ropes." On the other hand, parents may be more likely to come to school when their children are freshmen than after they have acclimated to high school.

Parent Engagement in Educational Planning

Some parents provide their children with help and advice in choosing their high school classes and career planning (Lareau & Weininger, 2008). Unfortunately, those students who do not receive such help from parents are not likely to receive help at school, either (Dounay, 2006). In this study, we investigate whether parents of ninth graders are involved in educational planning to the same extent as the parents of older high school students. Parents of ninth graders might be more involved, on average, than parents of older students because

they are aware of and attentive to the significant changes represented by high school as compared to middle school. Alternately, greater parent engagement in educational planning might occur as students move forward in high school because postsecondary choices become more proximal.

Influences on Parent Engagement During Ninth and Higher Grades

It is important to identify characteristics that predict parent engagement for scholarly and practical reasons. Understanding predictors of such engagement increases knowledge, identifies groups and dispositions to target in efforts to increase parent engagement, and identifies background differences that should be controlled in analyses associating outcomes with parent engagement. Bronfenbrenner's (2005) ecological systems theory posits that demographic and psychological characteristics will predict parent engagement. We test predictors among parents of both freshmen and students in the older grades to ascertain whether there are similar patterns in the two groups of parents.

Parental Demographic Characteristics

In this study, parental education, minority group membership, and immigrant status are considered as predictors of parent engagement. Previous studies have found that parents with higher education are more efficacious about being involved at school (Shumow et al., 2011) and are better prepared to assist directly with schoolwork at home (Patrikakou, 2004). The advantages conferred by education might be especially important during the ninth grade transitional period because, although all parents *want* their child to succeed, parents who themselves attained more education are more likely to *act* during difficult times than parents who attained less (Baker & Stevenson, 1986; Lareau & Weininger, 2007). Several studies indicate that college-educated parents are more likely than other parents to steer their children, regardless of prior academic performance, to more advantageous circumstances in high school through careful planning when they enter high school (Heredia & Hiatt-Michael, 2009; Lareau & Weininger, 2008; Mickelson & Cousins, 2011).

According to Hill and Taylor (2004), minority and majority families have different patterns of involvement with school. The tendency of minorities to be more involved at home than at school or in planning may be especially true for immigrants whose primary language is not English (Garcia Coll et al., 2002). Native-born parents are likely to have greater knowledge of how the U.S. school system works, so they may be better able to navigate at-school engagement and educational planning and thus be more engaged in those activities when their children start high school. Evidence that many immigrant parents of high school students have high expectations (Goldenberg, Gallier, Reese, & Garnier, 2001) and are deeply involved in encouraging academic

success (Strickland & Shumow, 2008) might predict that they will be especially involved at home during ninth grade.

Psychological Characteristics

Parental expectations for the student's educational attainment, the student's interest in science, and the student's difficulty in learning science are considered as predictors of the various types of engagement. Parents with high expectations are more likely to be involved with high school students than those with low expectations (Shumow et al., 2011); expectations might be of particular importance during the freshman year. Students who are interested in a subject are more likely to instigate parent engagement than students who are not (Shumow et al., 2011; Hoover Dempsey et al., 2005); students might be more likely to seek their parents' engagement during ninth grade because of the challenges or less likely because they are overwhelmed. Rogoff (1990) has noted how difficult it is for parents to watch their children struggle, so student difficulty might precipitate involvement. Parents of middle school students react to student struggle by more involvement at home, but parents of high school students tend to withdraw when their children struggle (Shumow & Miller, 2001; Shumow et al., 2011). It is not clear whether parents of freshmen will be more like middle or high school parents in how they react to their children's struggles.

Outcomes and Parent Engagement

Studies with middle and high school students find parent engagement at school to be associated with better grades in science and parent engagement at home to be associated with lower grades but greater school orientation and motivation in science class (Shumow et al., 2011). A correlation between parent engagement in educational planning and student outcomes is expected on theoretical grounds, but there is little evidence upon which to base predictions. We test the association between types of engagement and grade point average, time spent doing science homework, and student adjustment as measured by students' reports of perceived skill, interest, self-esteem, and belief that what they are learning in science is valuable, examining whether the types of parent involvement interact with freshman status in predicting those outcomes.

Method and Data Source

Context and Participants

Data were collected in 12 science classrooms in a single comprehensive high school serving students from a diverse community located on the fringe of a

large metropolitan area. Thirty-three percent of students in the school were considered "low income" based on free and reduced lunch data. The school serves 9th–12th graders and had an enrollment of approximately 3,300 in 2009. The average class size was 23.6 students, and teachers in the school district had an average of 11.5 years of experience. The graduation rate was 74%.

The SciMo Study (see http://scienceinthemoment.cedu.niu.edu/scienceinthemoment for extensive detail) was designed to oversample students in the 9th grade: 43% were in the 9th grade, 21% in the 10th grade, 34% in the 11th grade, and 2% in the 12th grade. Students came from three general science, three biology, three chemistry, and three physics classrooms (n = 244 students; some, n = 12, did not complete the school year). These classes were drawn from the "average" or regular track. The overall student participation rate across all classrooms was 91%, with half of the classrooms studied having complete (100%) participation. The sample was 53% male and 47% female. The student sample was 42% White, 37% Latino, 12% African American, 2% Asian, 1% Native American, and 6% multiracial. According to school records, 43% of students in the sample received free or reduced lunch.

Procedure

Researchers visited each classroom for 5 consecutive days in both fall 2008 and spring 2009. This study used data from surveys, the Experience Sampling Method (ESM), and school records.

Student Surveys

Students completed one-time surveys during both the fall and spring data collection periods pertaining to student characteristics (grade, age, gender, ethnicity); family background; educational background as well as students' future academic aspirations; science beliefs and learning; homework completion; and parental involvement in science education.

Experience Sampling Method

During two waves of data collection, students' subjective experience in each science classroom was measured repeatedly over a period of 5 consecutive school days using a variant of the Experience Sampling Method (Csikszentmihalyi & Larson, 1987). Participants wore a vibrating pager which was used to signal them unobtrusively using a remote transmitter at 2 randomly selected time points during each day's science class. To minimize the disruption to class flow and maximize the variety of classroom activities recorded, the pool of participants in each classroom was divided in half, with each half following a different signal schedule. In response to each signal, students completed an Experience Sampling Form (ESF) in which they briefly recorded their activities

and thoughts at the time of the signal, as well as various dimensions of their subjective experience. Each ESF took approximately 1-2 minutes to complete.

Using Likert scales, students used the ESF to report on multiple dimensions of their subjective experience. By the completion of the study, each participant had reported on multiple aspects of subjective experience on as many as 20 separate occasions. In total, 4,136 such responses were collected. In the fall semester, 2,139 responses were collected, for an average of 9.2 responses per participant (92% signal response rate). In the spring semester, 1,997 responses were collected, for an average of 9.1 responses per participant (91% signal response rate). Participant non-response was nearly entirely attributable to school absence.

This method has a high degree of external or "ecological" validity, capturing participants' responses in everyday life. There are indications that the internal validity of the ESM is stronger than one-time questionnaires as well. Zuzanek (1999) has shown that the immediacy of the questions reduces the potential for failure of recall and the tendency to choose responses on the basis of social desirability (see Csikszentmihalyi & Larson, 1987, and Hektner, Schmidt, & Csikszentmihalyi, 2007, for reviews of validity studies).

School Records

School records were obtained by the researchers. A school employee with access to student's individual records provided a file with students' science grades, grade point average (GPA), and "free lunch" status.

Measures

Parent Engagement

The student survey included 14 items pertaining to parents' involvement with participants' schooling and their science education. Principal components factor analysis with varimax rotation indicated that there were four factors which accounted for 59% of the variance. One of the factors had four dichotomous items pertaining to *parent engagement at school* during the school year (Cronbach's alpha = .77): attending school events, coming to school to watch them perform, talking to their science teacher at school, and knowing their science teacher. Another factor was comprised of four items pertaining to *parent engagement at home* during the school year (Cronbach's alpha = .75): checking science homework, helping with the science homework, finding someone to help with science homework, and limiting the amount of time the student watches TV or plays video games. Students reported the extent of parent involvement at home on a four point scale from 0 = never to 3 = often. *Parent engagement in educational planning* was measured with two items (Cronbach's

alpha = .64): discusses courses and program selection, and discusses career planning, measured on a three point scale from 0 = never to 3 = often. The other factor, *parent–student discussion about science topics* (four items) is not included in the present study.

Predictors of Parent Engagement

Parent education *(Pared)* was the highest level of education of either parent. *White* indicated that the student was not a member of a racial or ethnic minority group. Those who reported being born outside the United States (U.S.) and/or having one or both parents born outside the U.S. were considered *immigrants*. *Academic expectations* were assessed by asking the students how far in school their mother wants them to go. Two variables: *student finds science fun and interesting,* and *student reports difficulty with science* were measured by asking students to respond on a scale from 1 = strongly disagree to 4 = strongly agree. *First quarter grade in science* was used as an indicator of initial academic performance in science.

Academic Adjustment

There were multiple indicators of student's school adjustment. First were student reports of how they felt about themselves and their activities at the moment they were signaled. On a 4-point scale (0 = not at all, 1 = a little, 2 = somewhat, 3 = very much), students indicated "how skilled you felt at what you were doing" *(skill),* "how important that activity was to you" *(imp you)*, "how interesting the activity was to you" *(interest),* and "how good you felt about yourself" *(self-esteem)*. *Total homework hours* is the number of hours students reported doing science homework per week on an in-class survey completed during spring. *Grades* were obtained from school records with a mean of 2.4 (SD = .86).

Results

Grade Level Comparison by Type of Parent Engagement

Overall, the level of parent engagement was low. Freshmen reported greater parent engagement at home and lower parent engagement at school relative to students in the higher grades. The two groups did not differ with respect to parent engagement with educational planning (see Table 1).

Table 1. Types of Parent Engagement With 9th Graders Compared to Students in Higher Grades

Type of Involvement	Mean (SD)		*t*
	9th Graders	10th–12th	
At home	1.07 (.82)	0.85 (.75)	-2.1*
At school	0.40 (.37)	0.49 (.39)	1.8*
Educational Planning	1.15 (.60)	1.21 (.59)	0.82 (ns)

Note. *p < .05, ns = not significant.

Predictors of Parent Engagement

OLS regression was used to test whether models containing background characteristics predicted each of the three types of parent involvement for freshmen. Separate models were estimated for students attending higher grades. Table 2 presents the results of those analyses.

Table 2. Predictors of Types of Parent Engagement With Ninth Graders and Students in Higher Grades

	At Home		At School		Planning	
	9th	10th–12th	9th	10th–12th	9th	10th–12th
Parent Ed	.11	.03	.20	.34**	-.09	.01
White	-.12	.09	.11	.27*	.10	.22*
Immigrant	-.12	.14	-.36**	-.05	-.13	.04
Academic Expect	.19	.19^	.30**	.19*	.17	.30**
Science Interest	.29*	.35**	.16	.15	.41**	.08
Science Difficult	-.01	.02	-.13	-.02	.10	.02
1st Quarter Grades	-.03	-.27*	.08	-.15	.19	-.06
R^2	.14 ns	.21**	.36***	.35***	.23*	.15*

Note. ^p <.10, *p < .05, **p < .01, ***p < .001, ns = not significant. Standardized betas are displayed.

The model including background characteristics did not predict parent engagement at home for 9th grade students but did explain a significant amount of variance in parent engagement at home for students in higher grades. First quarter grades were negatively associated with parent engagement at home among students in the higher grades. In other words, if students did well early in the school year, parents appeared to step back from homework supervision, involvement, and rule-setting. If students were doing poorly early in the school year, however, parents responded by helping with homework or setting rules. Students' expressed interest in science early in the school year positively predicted parent engagement at home.

Parent engagement at school was predicted by the model containing background characteristics for both 9th graders and students in the higher grades.

With the exception of parents' academic expectations for the student, which predicted parent engagement at school for both groups of students, the other particular characteristics which predicted parents' engagement at school did differ by students' grade level. Immigrant parents of freshmen were less involved at school than native-born parents, but being an immigrant was not predictive of at-school involvement for students in higher grades. Having more years of education and being White were significant predictors of parent engagement at school for students in the higher grades but not for freshmen.

Parent engagement in educational planning was explained by the models containing background characteristics for both 9th graders and students in higher grades. The characteristics that predicted parent engagement in educational planning did differ by grade level. For 9th graders, only students' expressed interest in science was associated with parents being engaged in educational planning with them. For the students in the higher grades, parents who were White and who had high academic expectations were more likely to be involved in this way.

Parent Engagement and Academic Adjustment

As can be seen in Table 3, results of this study show that students in this sample encountered difficulties in 9th grade. Being a freshman in high school was associated with feeling less skilled and interested during science class, having lower self-esteem, and obtaining lower grades than students in higher grades. These outcomes were evident despite the fact that freshmen reported feeling both that class work was equally important to them and that they did an amount of homework equivalent to amounts reported by students in higher grades.

Overall, parent engagement at home was associated positively with students' engagement (perception that class was interesting and important) but negatively with GPA. Parent engagement at school was associated positively with sense of skillfulness and GPA but negatively with time spent doing homework. Parent engagement in planning was not associated with the outcomes examined in this study.

A central purpose of this study was to determine whether parent engagement had a differential impact for 9th graders than it did for students in the higher grades when controlling for background characteristics. Several interaction terms were significant, indicating that the relationship between parent engagement and outcomes differed for freshmen compared to older students. For the purpose of displaying those interactions visually, the parent engagement variables were split at the mean to create dichotomous variables indicating less than average and more than average parent engagement.

Table 3. OLS Regressions Predicting Student Outcomes for Freshmen and Students in Higher Grades by Type of Parent Involvement Controlling for Background Characteristics

	In-Class Motivational Indicators from ESM				Academic Adjustment	
	Feel Skillful	Import to You	Interest	Self-Esteem	GPA	Hours HW
Parent Ed	-.10	-.19*	-.11	-.14^	.11	-.01
White	-.07	-.11	.01	.09	.18*	-.01
Immigrant	.01	-.07	.04	.04	.13	-.07
Academic Exp. Mom	.04	.02	.13^	.01	.06	.10
Sci Interest	.28**	.44***	.28***	.33***	-.01	.06
Sci Difficult	-.13^	.01	-.06	-.14^	-.20***	-.01
Freshmen	-.63***	-.14	-.23*	-.37**	-.42*	-.11
PE Home	-.09	.19^	.21*	.05	-.30**	.16
PE School	.22*	-.02	-.16	.05	.22*	-.42**
PE Plan	-.09	.04	.14	.02	.08	.18
Interaction 9X PE-Home	.30*	.19^	.01	-.07	.39*	-.04
Interaction 9X PE-School	.06	.28*	.21^	.24^	-.05	.22
Interaction 9X PE-Plan	.26	-.12	.00	.01	.25	-.28
R^2	.30***	.30***	.28***	.26***	.26***	.15*
Adj R^2	.24***	.24***	.21***	.19***	.20***	.07*

Note. ^p <.10, *p < .05, **p < .01, ***p < .001. Standardized betas are displayed.

Ninth grade students whose parents were more engaged at home felt considerably more skillful during science class than students whose parents were less involved, whereas there was little difference in how skillful students in older grades felt relative to their parents' engagement at home (see Figure 1). In terms of grades, Figure 2 shows that 9th graders earned better grades if their parents were more involved at home; the exact opposite pattern can be seen for students in the higher grades. There was a marginally significant interaction between parent engagement at home and grade level in predicting how much students thought that what they were learning in class was important (valuable) to them. Examination of the interaction shows that when parents were more involved at home, students in the higher grades reported much greater valuing of their learning than 9th graders did when their parents were more involved. When parents were less involved at home, students did not differ in how much they valued what they were learning.

Figure 1 . Interaction between PE At-Home and Grade Level for Skill

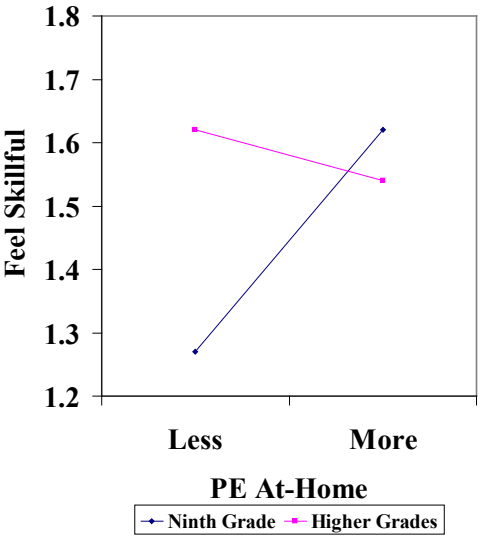
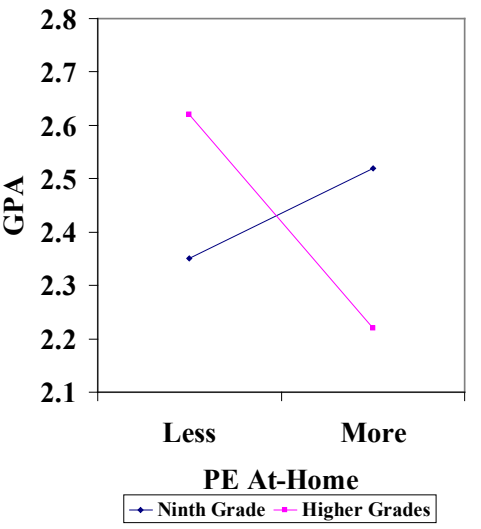
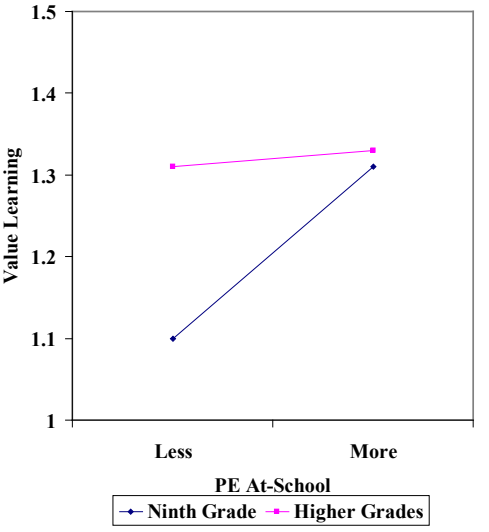


Figure 2. Interaction between PE At-Home and Grade Level for GPA



Grade level interacted with parent engagement at school in predicting students' ratings of the importance to them (value) of what they were learning in class. As can be seen in Figure 3, freshmen valued what they were learning in class significantly more when their parents were relatively more engaged at school than when they were relatively less engaged; the ratings for students in higher grades did not differ in relation to parent engagement at school. The interactions between grade level and parent engagement at school for predicting student interest and self-esteem during class were marginally significant. In both cases, students in higher grades had very similar ratings whether their parents were more or less engaged at school, but freshmen were much more interested and felt much better about themselves during class if their parents were relatively more engaged at school than if they were not.

Figure 3. Interaction between PE At-School and Grade Level for Value



Discussion

Before discussing the findings related to parent engagement by grade level, it is important to emphasize the limited school-focused engagement of parents with their high school students overall. Clearly, there remains much room for growth in school-related engagement among parents of high school students.

Comparison of Parents' Engagement with Ninth Graders and With Students in Higher Grades

The first purpose of this study was to compare the extent to which parents of 9th graders and parents of high school students in higher grades were engaged with their child's schooling at home, at school, and through educational planning. Parents of 9th graders were involved more at home and less at school than were parents of students in higher grades, but engagement in educational planning did not differ between student grade levels.

The greater at-home involvement of 9th graders' parents might be driven by the parents' desire to get their children off to a good start in high school. It is important to note that the parent involvement at home scale consisted of variables related to homework and to rules about behavior that would impact homework and academic performance. High school students are generally expected to do more homework than middle school students, and parents of 9th graders might be responding to that fact by engaging more at home. Both the time students spend doing homework and parental monitoring of homework have been associated with students' academic motivation and performance in high school (Cooper, Robinson, & Patall, 2006; Patall, Cooper, & Robinson, 2008; Shumow et al., 2011), underscoring the relevance of considering homework as a form of at-home involvement, even though more subtle forms of engagement at home are especially powerful, especially among urban families (Jeynes, 2010).

As has been noted by other researchers, some parents provide more help and advice about choosing high school classes and about career paths than other parents (Dounay, 2006; Lareau & Weininger, 2008). In this study, no differences were found between parents of 9th graders and parents of students in higher grades in terms of their engagement with educational planning.

Parents of 9th graders were less likely to be engaged at school. That could be because the parents were unfamiliar with the school or felt unwelcome or overwhelmed by the increased complexity of a high school, or it could indicate that their children had not yet become engaged in the activities that tend to draw parents into schools. The parent engagement at school scale included questions about whether parents knew the science teacher and had talked with

the science teacher. This is a very minimal indicator of engagement, yet many parents did not know or had never talked to the science teacher. It would be interesting to determine whether this situation is the same for all subject areas or whether parents are especially alienated from science teachers. Our data does not allow us to examine that issue, but it would be important information for educators to have. A future study could investigate that question.

Predictors of Parent Engagement

The second purpose of the study was to investigate possible predictors of each type of parent engagement. In terms of engagement at home, demographic and psychological characteristics were not predictive for the parents of 9th graders but were predictive for the parents of the students in higher grades. This is important information for educators. The findings suggest that a wide spectrum of parents might be responsive to invitations to be engaged at home during the freshman year when so many students struggle. The 9th grade transition is a critical time to establish a partnership with parents to support the development of skills to succeed in high school. Many students enter high schools lacking the skills to succeed (Herlihy, 2007). Parents are aware that the 9th grade is difficult, and they are anxious about it (Akos & Galassi, 2004). Yet, they are too often overlooked by schools as partners who can be enlisted and welcomed in endeavors to help. A considerable amount of evidence shows that students can develop skills, complete homework, and succeed academically with some adult guidance (Cleary, Platten, & Nelson, 2008; Shanahan & Shanahan, 2008; Slavin, Lake, & Groff, 2009), and parents need that information from schools.

The at-home engagement of parents in the higher grades was predicted by the model. Unique predictors that emerged were the students' interest in science, which was positively associated with parent engagement at home, and first quarter grades, which were negatively associated with parent engagement at home. It appears that parents were responsive to their children by increasing their involvement with homework when the child was either interested or when they were struggling. Nearly all parents want their child to succeed (Lareau & Weininger, 2007), but there are few programs for parents of high school students about helping and supporting their child academically. Parents of students who are especially interested in science could be alerted via electronic media about special programs available to extend students' interest in science. For example, they could be informed about science camps, STEM cafes, and special exhibits sponsored by nearby museums, laboratories, environmental centers, and colleges. Schools also might set up a procedure so that parents participate in an early warning system when students are struggling—parents need

to know who to tell when they notice that their child is struggling, and they need to be told when an educator notices that there might be problems. The warning system could be followed up by problem solving and strategy implementation to help the student persist and improve. Of course, such programs need to be evaluated after implementation to ascertain their effectiveness.

Educators also might want to increase at-school involvement by inviting more parents of 9th graders to come to school events to both meet and communicate with their child's teachers. Invitations from teachers are the most effective way to promote parent engagement (Hoover-Dempsey et al., 2005). Extracurricular activities are very important in developing a sense of belonging within the high school, and parents exert a strong influence on activity participation, so parents could be recruited as partners in encouraging their 9th graders to participate in activities and in supporting the students as spectators (Zarret & Eccles, 2009).

The results of the analyses predicting parent engagement at school further highlight the potential importance of identifying predictors of different types of parent engagement. For example, notwithstanding the importance of having schools reach out to and invite all parents of freshmen, the 9th grade results suggest that it is especially important to invite and encourage immigrants to participate in school events and to meet and communicate with the teacher at this important transitional point. Our data do not provide insight into *why* immigrants are less likely to be engaged at school during 9th grade. Future studies could seek to explain their reticence, which does not appear when students are in the higher grades.

The results for students in the older grades tell a familiar story—parents with relatively more social capital in terms of education and majority status are more likely to engage at school and with the teacher. As was previously noted, the vast majority of parents want their children to do well. An at-school program, *Families in Schools* (n.d.) of Los Angeles, is an example of a program focused on helping parents (particularly underserved parents) understand more about navigating the school in order to foster their children's success. Program participants were better able to read their children's academic records, understood more about how to talk with teachers, and gained knowledge about postsecondary programs. More programs that engage all parents of high school students in the higher grades need to be designed, implemented, and studied.

Contributions of Parent Engagement to Academic Adjustment

The final purpose of this study was to test whether specific types of parent engagement contribute to academic adjustment differently for freshmen than older high school students. Before discussing those differential effects, it

is important to emphasize that, despite the limited amount of parent engagement, relatively more parent engagement predicted student outcomes. Both at-school and at-home engagement were associated with indicators of student motivation and success. It is also important to note that our finding that parent engagement in planning was not associated with these outcomes should not be interpreted to mean that planning is not an important type of engagement. Our measure of parent engagement in educational planning was limited. It is also possible that outcomes not examined, like students' academic expectations or career goals, might be influenced by this form of engagement.

Several parent engagement processes did operate differently in predicting outcomes by grade level. Parent engagement at home did not seem to have much of an influence on how skillful students in the higher grades felt in science class, but it had a positive influence on 9th graders in science class. How skillful students feel in class is a very important motivator which impacts students' willingness to persist and which is typically problematic for 9th graders (Schmidt & Shumow, 2011). Our data show that when 9th grade students' parents are more engaged in monitoring homework, the students feel more skillful in class. The interaction between parent engagement at home and grade level for students' GPA shows that involvement is associated with higher grades for 9th graders and lower grades for students in the upper grades. Parent engagement with homework generally declines during adolescence in part because adolescents' sense of autonomy generally leads them to resist parent involvement in their homework. Consequently, parents tend to back off unless their children are failing which is reflected in a negative association between parent involvement and grades (Shumow, 2010; Shumow et al., 2011). That interpretation does not match what appears to be happening for 9th graders in this study, however. Perhaps the pervasive challenges associated with the 9th grade transitional period lead a broader range of students to accept their parents' involvement.

Parent engagement at school did not have much impact on how valuable students in the higher grades rated what they were learning in science class, but it did matter to 9th graders. Perhaps this finding indicates that 9th graders are especially sensitive to whether their parents know and communicate with the teacher. This finding should be replicated, and interviews could be conducted with students to reveal more about the meaningfulness to them of their parents' engagement at school.

Limitations and Conclusions

There are several limitations to this study. First, and most importantly, the study is cross-sectional. Longitudinal data is needed to show what happens to

individual students as they transition to high school and move on to the higher grades. Second, the study was conducted in one school district. The district is very diverse, and the school was chosen to be representative of the population in a large state, but aspects of the context could impact the findings. Third, parent engagement was measured in only one way (student report). Although that has been a common way of measuring parent engagement with adolescents, it would be ideal to have multiple sources of data. Finally, our measure of at-home engagement focused on homework. Jeynes (2010) has found through meta-analyses that subtle aspects of parenting at home, such as parenting styles (which describe socialization practices), parental expectations, and communication practices exert greater influence on children's academic outcomes than involvement in homework or rule setting.

Overall, however, the results support the importance of parent engagement during high school. Findings accentuate the observation made by Herlihy (2007) that parents are critical partners during 9th grade and bolster recommendations that educators should invite and facilitate parent engagement at home and at school when students enter high school. While there are numerous ways for schools to engage parents during the critical transition to 9th grade, few high schools have well-developed programs to do so. Programs need to be designed, implemented, and studied to identify which features of such programs are successful.

References

Akos, P., & Galassi, J. P. (2004). Middle and high school transitions as viewed by students, parents, and teachers. *Professional School Counseling, 7*(4), 212–221.

Baker, D., & Stevenson, D. (1986). Mother's strategies for children's school achievement: Managing the transition to high school. *Sociology of Education, 59*(3), 156–166.

Barber, B. K., & Olsen, J. A. (2004). Assessing the transitions to middle school and high school. *Journal of Adolescent Research, 19*, 3–30.

Benner, A. D., & Graham, S. (2009). The transition to high school as a developmental process among multiethnic urban youth. *Child Development, 80*(2), 356–376.

Bronfenbrenner, U. (2005). *Making human beings human: Bioecological perspectives on human development*. Thousand Oaks, CA: Sage.

Cleary, T. J., Platten, P., & Nelson, A. (2008). Effectiveness of the self-regulation empowerment program with urban high school students. *Journal of Advanced Academics*, *20*(1), 70–107.

Cooper, H., Robinson, J., & Patall, E. (2006). Does homework improve academic achievement?: A synthesis of research 1987–2003. *Review of Educational Research, 76*(1), 1–62.

Csikszentmihalyi, M., & Larson, R. (1987). Validity and reliability of the experience sampling method. *Journal of Nervous and Mental Disease, 175*, 526–536.

Dounay, J. (2006, April). Alignment of high school graduation requirements and state-set college admissions requirements. *ECS State Notes*. Retrieved from http://www.ecs.org/clearinghouse/68/60/6860.pdf

Eccles, J. S. (2007). Families, schools, and developing achievement-related motivations and engagement. In J. E. Grusec & P. D. Hastings (Eds.), *Handbook of socialization* (pp. 665–691). New York, NY: Guilford Press.

EPE Research Center. (2006, June 22). Diplomas count: An essential guide to graduation rates and policies. *EdWeek.* Retrieved from http://www.edweek.org/ew/toc/2006/06/22/index.htm

Families in Schools. (n.d.). *Success stories*. Retrieved from http://www.familiesinschools.org/our-impact/meet-our-families/

Garcia Coll, C., Akiba, D., Palacios, N., Bailey, B., Silver, R., DiMartino, L., & Chin, C. (2002). Parental involvement in children's education: Lessons from three immigrant groups. *Parenting: Science and Practice, 2*(3), 303–324.

Goldenberg, C., Gallimore, R., Reese, L., & Garnier, H. (2001). Cause or effect? A longitudinal study of immigrant Latino parents' aspirations and expectations, and their children's school performance. *American Educational Research Journal, 38*(3), 547–582.

Hektner, J. M., Schmidt, J. A., & Csikszentmihalyi, M. (2007). *Experience sampling method: Measuring the quality of everyday life*. Thousand Oaks, CA: Sage.

Heredia, R. C., & Hiatt-Michael, D. B. (2009, April). *Perspectives of Latino parents: Empowered voices*. Paper presented at the Annual Meeting of the American Educational Research Association, San Diego, CA.

Herlihy, C. (2007). *Toward ensuring a smooth transition into high school* [Issue brief]. Washington, DC: American Institutes for Research, National High School Center. Retrieved from www.betterhighschools.org/docs/ NHSC_TowardEnsuring_051607.pdf

Hill, N. E., & Taylor, L. C. (2004). Parental school involvement and children's academic achievement: Pragmatics and issues. *Current Directions in Psychological Science, 13*(4), 161–164.

Hill, N. E., & Craft, S. A. (2003). Parent–school involvement and school performance: Mediated pathways among socioeconomically comparable African-American and Euro-American families. *Journal of Educational Psychology, 95*, 74–83.

Hoover-Dempsey, K. V., Walker, J. M. T., Sandler, H. M., Whetsel, D., Green, C. L., Wilkins, A. S., & Closson, K. E. (2005). Why do parents become involved? Research findings and implications. *Elementary School Journal, 106*(2), 105–130.

Isakson, K., & Jarvis, P. (1999). The adjustment of adolescents during the transition into high school: A short-term longitudinal study. *Journal of Youth and Adolescence, 28*(1), 1–26.

Jeynes, W. H. (2005). Effects of parental involvement and family structure on the academic achievement of adolescents. *Marriage & Family Review, 37*(3), 99–116.

Jeynes, W. (2010). The salience of the subtle aspects of parental involvement and encouraging that involvement: Implications for school-based programs. *Teachers College Record, 112*(3), 747–774.

Lareau, A., & Weininger, E. (2008). Class, culture, and child rearing: The transition to college. In A. Lareau & D. Conley (Eds.), *Social class: How does it work?* (pp. 118–151). New York, NY: Russell Sage Foundation.

Lee, V. E., Bryk, A., & Smith, J. (1993). The organization of effective secondary schools. *Review of Research in Education,* 19, 171–237.

Mickelson, R., & Cousins, L. (2011). The math/science equity project: Working with educators to increase African American parental involvement in secondary math and science course placements. In C. Hands & L. Hubbard (Eds.), *Including families and communities in urban education* (pp. 189–211). Charlotte, NC: Information Age.

Newman, B. M., Newman, P. R., Griffen, S., O'Connor, K., & Spas, J. (2007). The relationship of social support to depressive symptoms during the transition to high school. *Adolescence, 42*, 441–459.

Patrikakou, E. (2004). Adolescence: Are parents relevant to students' high school achievement and post-secondary attainment? *Family Involvement Research Digest*. Cambridge, MA: Harvard Family Research Project. Retrieved from http://hfrp.org/family-involvement/publications-resources/adolescence-are-parents-relevant-to-students-high-school-achievement-and-post-secondary-attainment

Patall, E., Cooper, H., & Robinson, J. (2008). Parent involvement in homework: A research synthesis. *Review of Educational Research, 78*(4), 1039–1101.

Rogoff, B. (1990). *Apprenticeship in thinking: Cognitive development in social context*. New York, NY: Oxford University Press.

Schmidt, J. A., & Shumow, L. (2011, April). *Perceived competence and subjective experience of ninth graders versus other high school students in science*. Paper presented at the Annual Meeting of the American Educational Research Association, New Orleans, LA.

Seidman, E., Aber, J. L., Allen, L., & French, S. E. (1996). The impact of the transition to high school on the self-system and perceived social context of poor urban youth. *American Journal of Community Psychology, 24,* 489–515.

Shanahan, T., & Shanahan, C. (2008). Teaching disciplinary literacy to adolescents: Rethinking content-area literacy. *Harvard Educational Review*, *78*(1), 40–59.

Shumow, L. (2010). Parent involvement at home. In D. Hiatt-Michael & C. Hands (Eds.), *Promising practices to support family involvement in schools* (pp. 57–74). Charlotte, NC: Information Age.

Shumow, L., Lyutykh, E., & Schmidt, J. A. (2011). Predictors and outcomes of parental involvement with high school students in science. *School Community Journal*, *21*(2), 81–98. Retrieved from http://www.schoolcommunitynetwork.org/SCJ.aspx

Shumow, L., & Miller, J. D. (2001). Parents' at-home and at-school academic involvement with young adolescents. *The Journal of Early Adolescence, 21*(1), 68–91.

Slavin, R. E., Lake, C., & Groff, C. (2009). Effective programs in middle and high school mathematics: A best-evidence synthesis. *Review of Educational Research*, *79*(2), 839–911.

Strickland, M. J., & Shumow, L. (2008). Family matters: Exploring the complexities of families of immigrant adolescents and achievement in four G8 countries. *Open Family Studies Journal, 1*, 39–48.

Wheelock, A., & Miao, J. (2005, March). The ninth grade bottleneck. *The School Administrator.* Retrieved from http://www.aasa.org/SchoolAdministratorArticle.aspx?id=8728&terms=wheelock

Zarrett, N. R., & Eccles, J. (2009). The role of family and community in extracurricular activity participation: A developmental approach to promoting youth participation in positive activities during the high school years. In L. Shumow (Ed.), *Promising practices for family and community involvement during high school* (pp. 27–51). Charlotte, NC: Information Age.

Zuzanek, J. (1999). *Experience sampling method: Current and potential research applications*. Paper presented at the workshop on time-use measurement and research, National Research Council, Washington, DC.

Authors' Note: This paper is based on a presentation given at the International Roundtable on School, Family, and Community Partnerships 2012. The material is based upon work supported by the National Science Foundation under

Grant No: HRD-0827526. Any opinions, findings, conclusions, or recommendations expressed in this material are those of the author(s) and do not reflect the views of the National Science Foundation.

Lee Shumow is a professor of educational psychology at Northern Illinois University where she is a Distinguished Teaching Professor. Her research focuses on out-of-school influences on the school adjustment of children and adolescents. She has conducted numerous studies of homework and other forms of parent engagement with school using different methodologies. Correspondence concerning this article should be addressed to Lee Shumow, Northern Illinois University, LEPF Department, DeKalb, IL, 60115, or email lshumow@niu.edu

Jennifer A. Schmidt is associate professor of educational psychology at Northern Illinois University. Her current research focuses on student engagement and motivational processes in high school science classrooms.