EMPIRICAL RESEARCH

Perceived Parental Investment in School as a Mediator of the Relationship Between Socio-Economic Indicators and Educational Outcomes in Rural America

Kimberly L. Henry · Thomas M. Cavanagh · Eugene R. Oetting

Abstract Each year, 1.3 million students fail to graduate, dropping the United States' high school graduation rate to 69%. One of the most salient predictors of high school dropout is socio-economic status (SES), which makes important an improved understanding of the reasons why SES affects educational outcomes. In this study, multilevel mediation models were utilized to examine parental investment in school as a mediator of the relationship between SES and educational outcomes among an ethnically diverse sample of 64,350 7th to 9th grade students from 199 rural communities and towns in the U.S. (50% male, 63% non-Hispanic White). These relationships were assessed at the individual and school district level. Results indicate that parental investment is an important mediator at both levels. Within school districts, 28% of the effect of SES on the expectation to graduate from high school is mediated by perceived parental investment. Between school districts, 60% of the effect of concentrated disadvantage on the district's high school graduation rate and nearly all (87%) of the effect of concentrated disadvantage on the average expectation to graduate from high school among students in the district is mediated by perceived parental investment. Implications for prevention are discussed.

Keywords Parental investment in school · Family processes · Poverty · Dropout · Rural

K. L. Henry (✉) · T. M. Cavanagh · E. R. Oetting
Department of Psychology, Colorado State University,
Ft. Collins, CO 80523-1876, USA
e-mail: kim.henry@colostate.edu

Introduction

Each year, 1.3 million students fail to graduate and recent estimates indicate that only 69% of youth in American schools graduate on time and with a regular diploma (Diplomas Count 2009). This statistic is alarming, especially when considering the deleterious short and long term consequences of dropping out of high school, consequences that extend to the individual, their family, and society at large. These consequences include substantially lower earnings over the life course (Rouse 2005), poorer health (Muennig 2005), more dependence on public assistance (Waldfogel et al. 2005), and increased likelihood of involvement in crime and incarceration (Moretti 2005). Indeed, prevention of school dropout is a major public health concern.

One of the most salient predictors of high school dropout is socio-economic status (SES) and this relationship is evident at both the individual level (Hauser et al. 2004; Ingels et al. 2002) and school (or school district) level (Balfanz 2007; Civil Rights Project 2005). That is, *students* from lower socio-economic backgrounds drop out of school at a higher rate than students from higher socio-economic backgrounds, and *schools* or *school districts* that serve a higher proportion of youth from lower socio-economic backgrounds have a substantially higher dropout rate. Clearly, SES exerts a formidable effect on the likelihood that an individual will graduate from high school and the graduation rate of a school or school district.

A negative relationship between SES and educational expectations has also been observed among younger students (Brantlinger 1992; Kao and Tienda 1988; McLoyd and Jozefowicz 1996; Mello 2009; St-Hilaire 2002). This is an important point because a student's academic expectations or aspirations are strong predictors of their eventual

educational attainment (Eccles et al. 1998). This link between SES and early educational expectations may hold important implications for prevention/intervention. Earlier intervention with students who hold low educational expectations may be more fruitful than trying to mitigate the ill-effects of high school dropout after it occurs.

Prevention of Academic Underachievement and High School Dropout

Academic underachievement is a primary precursor to eventual dropout. Much of the prior research examining disparities in educational outcomes as a function of SES has focused on the effectiveness of schools (Rumberger and Arellano-Anguiano 2004), yet a landmark study by Coleman (1990) found that schools accounted for only 5–38% of the total variation in student test scores. Clearly a large proportion of variance in academic achievement can be attributed to factors external to the school itself. Multiple subsequent studies have also found that a greater proportion of the variance in test scores lies within schools than between schools (Rumberger and Arellano-Anguiano 2004). Perhaps the most influential context outside of the school that affects academic achievement is the family (Booth and Dunn 1996; Bradley et al. 2001; Crosnoe 2001; Dearing et al. 2006; Epstein and Sheldon 2002; Fan and Chen 2001). In this manuscript we consider one potentially modifiable aspect of family influences on students' educational outcomes—parental investment in their child's education. Specifically, we will assess the extent to which parental investment (as perceived by the child) mediates (i.e., explains) the effects of socio-economic indicators on educational outcomes at both the individual and school district level among youth residing in rural communities and towns in the U.S. If perceived parental investment emerges as a mediator, then a stronger focus on the enhancement of parental investment as a prevention mechanism is warranted.

The Definition of Parental Investment

The study of parental investment in a child's schooling is a relatively new field, and definitions of parental investment tend to vary across discipline and are still emerging in the literature (Hill and Chao 2009a). For example, The No Child Left Behind Act of 2001 (2002) requires schools to engage in and promote what they call parental involvement, defined as "the participation of parents in regular, two-way and meaningful communication involving student academic learning and other school activities." Alternatively, economists often consider parental investment in collective terms rather than mechanisms employed by individual parents (Hill and Chao 2009a). As a critical

mass or active group of parents form to influence the school or school district policies and practices, parents gain a voice in determining the direction of school programs, practices, and policies—all of which may have a positive effect on the educational outcomes of the entire student body. On the other hand, psychologists tend to focus on individual parents' investment in their child's schooling, with specific attention paid to behavioral involvement, cognitive/intellectual stimulation, and personal endorsement of academic achievement (Hill and Chao 2009a). Behavioral involvement is defined by parents' actions, including volunteering at school, helping with homework, and keeping an open communication flow with the school. Cognitive/intellectual stimulation captures the extent to which parents expose their children to learning development opportunities, including extracurricular activities, trips to libraries and museums, current events, intellectually stimulating discussions, and learning materials. Finally, personal endorsement reflects the extent to which parents perceive school as important and valuable, hold a favorable attitude toward school, and have high academic aspirations for their child. While the definition of parental investment is rather broad, the study of it is emerging in multiple disciplines, and further work to craft a comprehensive definition and develop valid and reliable measures is needed. Studies that examine components of parental investment will move this work forward.

The Relationship Between Parental Investment During Middle School and Educational Outcomes

A recent review by Hill and Tyson (2009) demonstrates that there is a strong relationship between parental investment during middle school and educational outcomes. Both cross-sectional and longitudinal studies indicate that higher levels of parental investment in school are associated with better academic achievement for students. For example, the review indicates that parental investment is associated with better academic skills, social competence, loftier future aspirations, and increased homework completion. Based on this work, we can hypothesize that enhancement of parental investment may have beneficial effects on a child's academic achievement, although experimental work is needed to determine if this effect is causal.

A great deal of the work in this area has considered one particular type of parental investment–parental involvement at school. Hill and Taylor (2004) describe two main mechanisms through which this type of investment affects academic achievement. The first is referred to as social capital. When parents are involved in their child's school, they gain critical skills and information that better equip them to assist their children in school-related activities. As parents interact with school personnel, they learn information about the

school's expectations for academic achievement and student behavior, which better prepares parents to augment students' learning at home. The second mechanism is social control, defined as families and schools working together to build a consensus about appropriate behavior that can be effectively communicated to students at both home and school. When parents and schools agree on priorities, students receive clear and salient messages about their academic responsibilities. Beyond actual involvement at school, the child's perception that their parents expect school success and positive behavior at school (e.g., completion of homework, success on exams, positive behavior at school, and ultimately graduating from high school) is also a form of social control. This premise is in line with the social development model (Hawkins and Weis 1985), which indicates that children are motivated to conform to the norms and standards put forth by pro-social entities in their lives, in this case their family and school. Through these mechanisms, parental investment in school is associated with better educational outcomes for adolescents (Hill and Tyson 2009).

Motivation for Parental Investment

Hoover-Dempsey and colleagues (Hoover-Dempsey et al. 2005, 2009; Hoover-Dempsey and Sandler 1997) indicate that parents become involved and invested in their adolescent's schooling for a variety of reasons. First, personal motivators, such as role-construction (i.e., perception that it is a parent's responsibility to be invested), drive many parents to be actively invested. Second, family demographic variables and life experiences impact parental investment. For example, SES, a parent's own educational experiences, cultural norms, parental knowledge/skills to promote academic achievement, and parents' available time and energy are all related to parental investment. Finally, the extent to which a parent feels welcome at the school can significantly impact their involvement in school meetings, volunteer activities, and other school events. These factors come together to predict whether or not, and the extent to which, a parent is invested in their child's schooling.

Socio-Economic Status and Parental Investment

Research indicates that some forms of parental investment in school tend to be lower among lower SES families (Grolnick and Slowiaczek 1994; Lareau 2004); however, little is known about these relationships among adolescents. That is, while both SES and parental investment are related to educational outcomes, there is little information about the extent to which parental investment may play a role in the relationship between SES and educational outcomes during adolescence. Moreover, as described previously, there is strong evidence that SES is related to educational outcomes at both the individual level (e.g., youth from lower SES families are more likely to drop out of school) and the school district level (concentrated socioeconomic disadvantage in a community is associated with a higher rate of dropout). However, we do not know if parental investment may mediate these effects at either or both levels. This is important work because identification of modifiable mediators, like parental investment, offers important implications for prevention and intervention.

Parental Investment and Academic Achievement Among Rural-Dwelling Adolescents

People often assume that low graduation rates are a challenge faced primarily by inner city schools, and most previous research has focused on this specific area (Zehr 2010). However, recent research shows that academic underachievement and high dropout rates are not solely an inner city problem. These same problems exist in rural America. Schools in rural communities and towns cater to the same underserved sections of the population as their urban counterparts, including poor and minority students, who are at the highest risk of underachievement and dropping out. For example, while overall graduation rates in rural schools are higher than urban schools (73% compared to 59%), graduation rates for minorities are similar, including 54% for rural Blacks. Furthermore, rural schools have the highest population of American Indian students, only 51% of whom ever obtain a high school degree. In fact, more than 20% of the nation's two thousand poorest-performing high schools are located in rural areas (Alliance for Excellent Education 2010). Unfortunately, little research has focused on high school dropout outside of urban and suburban areas. This dearth of research is especially problematic in light of the fact that 3.4 million American students currently attend rural high schools, and that number is on the rise (Alliance for Excellent Education 2010). With so many students attending rural high schools, the challenges they face do not merely represent a regional problem- the problems affect the future of the next generation of Americans, and thus America as a whole. Therefore, more work that focuses specifically on students in rural communities and towns is needed.

Objectives of the Current Study

Given the paucity of research assessing the relationship between socio-economic indicators and educational outcomes in smaller communities and towns in America, the first objective of this study is to simply present the simple

and adjusted correlations between these constructs at each level of the model (i.e., individual and school district). We hypothesize that a significant negative effect between socio-economic indicators and educational outcomes will be apparent at each level. That is, lower SES students will hold a lower expectation to graduate from high school and school districts located in communities with more concentrated disadvantage will have, on average, students with lower high school graduation expectations and a lower overall estimated graduation rate.

We then extend this model by assessing perceived parental investment as a mediator of the relationship between socio-economic indicators and educational outcomes. If perceived parental investment emerges as a mediator, then it suggests that enhancement of parental investment could potentially improve educational expectations and graduation rates, and further studies to determine if the mediation effect is causal are warranted. However, if perceived parental investment does not mediate the effect of socio-economic indicators and educational outcomes (or only partially mediates), then it points to the need for further research to determine which variables do mediate these effects, that is, which variables explain why socio-economic indicators predict educational outcomes. We assess these effects within a multilevel context. At the individual level (i.e., Level 1), we hypothesize that the effect of SES on the expectation to graduate from high school is mediated (i.e., explained) in part by perceived parental investment in school (i.e., adolescents' perception that their parents are invested in their schooling). At the school district level (i.e., Level 2), we hypothesize that the effect of concentrated disadvantage on both the district's high school graduation rate and the average expectation to graduate from high school are mediated in part by the average level of perceived parental investment among students in the district.

Methods

Participants

Participants in this study were 64,350 male and female 7th to 9th grade students from 199 school districts located in rural communities and towns across the contiguous United States who took place in a study of substance use between 1996 and 2000 (see Stanley et al. 2008, for details on the study design). Within each community, surveys were administered at one public high school and the associated feeder schools. In the few cases where there was more than one high school in the community, the high school determined to be the most representative socio-demographically of the community was chosen.

Procedures

Anonymous surveys were given with passive parental consent, and procedures ensured complete confidentiality. The protocol was approved by the Institutional Review Board at Colorado State University. Across schools, the percent of students surveyed ranged from 75–100% of the total student body. All data were collected using a paper and pencil survey that was conducted during school hours. The 99-item instrument, titled the Community Drug and Alcohol Survey (CDAS), asked a variety of questions related to substance use, school attachment, relationships with family and peers, and other individual risk factors for substance use. These survey items were derived from either The American Drug and Alcohol Survey, by E. R. Oetting, F. Beauvais, and R. Edwards, 1984, Fort Collins, CO: Rocky Mountain Behavioral Science Institute (RMBSI), copyright 1984 by RMBSI, or The Prevention Planning Survey, by E. R. Oetting, R. Edwards, and F. Beauvais, 1996, Fort Collins, CO: RMBSI, copyright 1996 by RMBSI.

Measures

Low SES

Taken from the CDAS, low SES is a composite measure made up of five items: father's years of education, mother's years of education, the adolescent's perception of the family's wealth ("Is your family"…1 = very rich, 2 = rich, 3 = average, 4 = poor, 5 = very poor), the adolescent's perception that the family has enough money to buy the things they want (1 = yes, all of the time, 2 = yes, most of the time, 3 = some of the time, 4 = almost never), and the adolescent's perception that the family has enough money to buy the things they need (1 = yes, all of the time, 2 = yes, most of the time, 3 = some of the time, 4 = almost never). A factor analysis was conducted on these items. A single factor emerged, and the resulting factor score formed the Level 1 low SES construct (standardized factor loadings for the five items listed above, with parent education reverse coded, were .54, .55, .47, .55, and .54, respectively), Cronbach's alpha = .66. This predictor was group mean centered for analysis.

Parental Investment

Six indicators of parental investment, the mediator(s), were measured via the CDAS. The first four consider the students' perceptions of how concerned their parents would be if they skipped school (CON1), got a bad grade (CON2), did not finish their homework (CON3), and quit school

(CON4). For the analysis, these indicators differentiate students who indicated their parents would care "not at all" or "not much" from those who indicated that they would care "some" or "a lot." The fifth and sixth indicators of parental investment consider parental involvement. The first item (INV1) asked "Does your family go to school events like music programs, sports events, etc.?" and the second item (INV2) asked "Does your family go to school meetings like PTA or PTO, back to school night, etc.?" For the analysis, these indicators differentiate students who indicated that their parents do not attend these events from those who do attend (even minimally). Chronbach's alpha for these items is not an appropriate assessment of scale reliability because, as described in the Analysis section, these six items were specified as a multilevel factor model for binary indicators in the mediation model (Grilli and Rampichini 2007). This method decomposes each indicator into a within unit and between unit component. As a more appropriate assessment of the scale properties, the factor loadings at each level and fit statistics for the final model are presented in the results section.

Academic Expectations to Graduate from High School

Students' academic expectation to graduate from high school, the Level 1 outcome, was measured with a single item from the survey: "Will you graduate from high school?" The item was measured on a 5-point scale, $1 =$ no chance that I will, $2 =$ poor chance, $3 =$ fair chance, $4 =$ good chance, $5 =$ yes, I'm sure that I will. Due to the heavy skew, this item was trichotomized in the following manner: $2 =$ yes, I'm sure that I will—83% of the students, $1 =$ good chance that I will—11% of the students, and $0 =$ all lower responses—6% of the students.

Level 1 Demographic Control Variables

Control variables in the Level 1 model include age, gender, and race/ethnicity (represented by 5 dummy coded variables to compare Hispanic, African American, American Indian, Asian, and students reporting some other ethnicity (or those not responding to the question) to non-Hispanic, White youth). These control variables were group-mean centered for analysis.

Concentrated Disadvantage

Level 2 variables were extracted from the National Center for Educational Statistics (NCES) Database and the 1990 U.S. Census Database. Concentrated disadvantage, the primary Level 2 predictor, is a six-item composite scale made up of census variables that describe the community hosting the school district. These variables include (1) the

per capita income; (2) the percent of adults who dropped out of high school; (3) the percent of households that received public assistance; (4) the percent of children under the age of 18 who lived with a mother who was a high school dropout, who was divorced or separated, and lived below the 1989 poverty level; (5) the percent of households under the poverty line; and (6) the unemployment rate. A factor analysis was performed on these six items. The items loaded onto a single scale (standardized factor loadings equal .73, .77, .90, .81, .91, .68, respectively, for items 1–6 described above). Cronbach's alpha $= .91$. The resultant factor score was utilized as the Level 2 concentrated disadvantage indicator. This predictor was grand mean centered for analysis.

School District Graduation Rate

A four-year graduation rate based on a cohort of 9th grade students is the optimal measure of a district's graduation rate. In this method, the cohort is longitudinally tracked as it moves from 9th grade through graduation 4 years later and an accurate assessment of the four-year graduation rate may be calculated. However, at this point in time, few school districts maintain and report the type of longitudinal records necessary to accurately calculate the graduation rate in this way. Therefore, alternative measures to estimate a district's graduation rate have been proposed, with the most widely used referred to as the Cumulative Promotion Index (CPI; Swanson 2004a, b). The CPI is available for the past 10 years for each district with reliable data from the Editorial Projects in Education Research Center (2010). As described by Swanson (2004b) "the value of the CPI indicator approximates the probability that a student entering the ninth grade will complete high school on time with a regular diploma…the measure does this by representing high school graduation as a stepwise process composed of three grade-to-grade promotion transitions (grade 9–10, 10–11, and 11–12) in addition to the ultimate high school graduation event (grade 12 to diploma)" (p. 14). For example, the formula for the CPI for the 2005 graduating class is as follows:

$$CPI_{2005} = \left[\frac{E^{10}_{2006}}{E^{9}_{2005}}\right] \cdot \left[\frac{E^{11}_{2006}}{E^{10}_{2005}}\right] \cdot \left[\frac{E^{12}_{2006}}{E^{11}_{2005}}\right] \cdot \left[\frac{G_{2005}}{E^{12}_{2005}}\right]$$

where E represents enrollment, the superscript denotes grade level, the subscript represents the year the school year ended (e.g., 2005 represents the 2004–2005 school year and 2006 represents the 2005–2006 school year), and G represents the number of students who graduated during that year. For each grade cohort (i.e., 7th, 8th, and 9th grade), we extracted the districts' CPI for the year the grade cohort should have graduated from high school, that is, 3 years after the survey for 9th grade students, 4 years

after the survey for 8th grade students, and 5 years after the survey for 7th grade students. As such, for each district, we extracted three consecutive CPI's—one for each grade cohort. We took the average of the three CPI scores to form the overall CPI for each district. For purposes of analysis, we multiplied the CPI by 100 so that it may be interpreted as a percentage.

Level 2 Control Variables

Finally, control variables in the Level 2 model include the per-pupil expenditure, pupil-teacher ratio, and number of students in the district during the year of the survey. Each of these variables was extracted from the National Center for Educational Statistics (NCES) database. Other control variables describe the community. The ethnic or racial composition compares predominantly White communities (over 60% Anglo Americans) to African American communities (over 40% African Americans) and Mexican–American communities (over 40% Mexican–Americans). Geographic region compares the Northeast, West, Midwest, and Southern regions of the U.S. Level of rurality compares school districts classified by the NCES as a rural community to those classified as a town. Given the focus on rural communities and towns in this study, we excluded school districts classified as a city or on the urban fringe of a city. Finally, we controlled for average age of the students in the district who completed the survey. All of these control variables were grand mean centered for analysis. Descriptive statistics for all variables are reported in Table 1. A correlation matrix of the key variables is reported in Table 2.

Analysis

All models were estimated as random intercept multilevel models with two levels using Mplus, Version 6.0 (Muthén and Muthén 2007) and following the protocol for testing multilevel mediation offered by Preacher et al. (2010). Level 1 represents students and Level 2 represents school districts. The hypotheses in this study assess the relationship between socio-economic indicators and educational outcomes, as well as the extent to which perceived parental investment in school mediates (i.e., explains) this relationship. At Level 1 (the student level), parental investment varies across students; some students report high parental investment and some students report low parental investment. At Level 2 (school districts), we utilize the Level 1 perceived parental investment scores to indicate the compositional or average level of perceived parental investment among students in a particular district. This average level varies across districts; in some districts the average level of perceived parental investment is high and in others it is relatively low.

We modeled the perceived parental investment items as a multilevel factor model for binary indicators. The six items that assess perceived parental investment in this study were designed by the instrument developers to load onto two separate scales. The first scale is intended to assess what we call perceived parental concern about the adolescent's academic achievement. This encompasses the four items labeled CON1-CON4 in the measurement section and in Fig. 1. The second is a two-item scale that measures parents' involvement at school, that is, attendance at extracurricular school events and attendance at school meetings (labeled INV1-INV2 in the measurement section and in Fig. 1). Following the protocol offered by Grilli and Rampichini (2007), we examined the factor structure of these items at each level, specifically studying whether one or two factors should be specified at each level. These analyses indicated that the best model for the data included two separate but correlated latent variables at Level 1: one for perceived parental concern (CON1-CON4) and one for perceived parental involvement (INV1-INV2), and one latent variable at Level 2. This single Level 2 perceived parental investment factor adequately captured the variance in the six items described above (CON1-CON4, INV1-INV2). We retained this factor structure for all subsequent models. The measurement error is appropriately modeled in these six indicators at Level 1 and Level 2 because parental investment is treated as a latent construct at each level. While latent factors at Level 1 are commonly used and understood, latent factors at Level 2 are less commonly used and perhaps not as well understood. In this approach, the Level 2 parental investment factor is modeled as a latent variable that is informed by the responses of the individual students in the school district. This technique avoids simply forming an aggregated mean based on the student responses to the parental investment items and assuming that this mean is an error-free measure of parental investment in the district (Grilli and Rampichini 2007). It is particularly important that the mediator in a mediation model is reliable and free of error in order to obtain unbiased estimates of the indirect effect (Mackinnon 2008). Therefore, this modeling approach provides a superior assessment of parental investment at each level than would have been obtained by modeling the manifest items or averaged scales.

The full multilevel mediation model tested in this study is depicted in Fig. 1. In all models the expectation to graduate from high school and the parental investment indicators were treated as categorical variables (binary indicators for the parental investment items and ordered polytomous for graduation expectation). The model was estimated using a robust weighted least squares estimator.

Table 1 Descriptive statistics

	M	SD	MIN	MAX
Level 1 variables				
Socio-economic status indicators				
Father's education	12.53	2.44	6.00	17.00
Mother's education	12.69	2.36	6.00	17.00
Perception of family wealth	2.90	0.48	1.00	5.00
Perception that family can buy what they want	2.26	0.72	1.00	4.00
Perception that family can buy what they need	1.48	0.65	1.00	4.00
Parent attends school events	0.84		0.00	1.00
Parent attends school meetings	0.60		0.00	1.00
Parent cares if child skips school	0.91		0.00	1.00
Parent cares if child gets a bad grade	0.86		0.00	1.00
Parent cares if child doesn't finish homework	0.80		0.00	1.00
Parent cares if child quits school	0.93		0.00	1.00
Student expects to graduate from high school	1.77	0.55	0.00	2.00
Age	13.70	1.08	10.00	17.00
Male	0.50		0.00	1.00
Non-Hispanic White	0.63		0.00	1.00
African American	0.16		0.00	1.00
Hispanic	0.12		0.00	1.00
Asian	0.01		0.00	1.00
American Indian	0.02		0.00	1.00
Other ethnicity or ethnicity not reported	0.06		0.00	1.00
Level 2 variables				
Concentrated disadvantage indicators				
Per capita income	10079.00	2833.71	4362.00	28954.00
Percent of adults who dropped out of high school	33.94	11.20	8.27	61.96
Percent of households on public assistance	10.14	5.97	0.00	32.33
Percent of families classified as at-risk	7.63	8.00	0.00	41.91
Percent of households under the poverty line	20.67	10.63	3.07	58.45
Percent of adults unemployed	7.53	4.20	0.00	24.37
Proportion of parents who attend school events	0.87	0.07	0.68	1.00
Proportion of parents who attend school meetings	0.62	0.09	0.38	0.91
Proportion of parents who care if child skips school	0.91	0.04	0.76	1.00
Proportion of parents who care if child gets a bad grade	0.86	0.04	0.71	0.96
Proportion of parents who care if child doesn't finish homework	0.81	0.05	0.66	0.93
Proportion of parents who care if child quits school	0.93	0.05	0.75	1.00
Average expectation to graduate from high school	1.77	0.08	1.51	1.95
Cumulative Promotion Index (CPI)	71.28	12.51	30.65	98.74
Per Pupil Expenditure (PPE)*	6841.21	1509.24	4018.00	13774.00
Pupil Teacher Ratio (PTR)	14.88	2.72	4.70	21.40
Number of students in the district*	2055.95	2419.01	73.00	15258.00
Northeast region of U.S.	0.02		0.00	1.00
Midwest region of the U.S.	0.29		0.00	1.00
West region of the U.S.	0.16		0.00	1.00
South region of the U.S.	0.53		0.00	1.00
Rural district	0.70		0.00	1.00
Mexican–American community	0.13		0.00	1.00
African American community	0.17		0.00	1.00
Average age of students who completed the survey	13.74	0.24	13.18	14.40

* Variable was logged for analysis. *SD* is not given for binary variables and the value under *M* is a proportion

Table 2 Correlation matrix of key study variables

	1	2	3	4	5	6	7	8	9
1. Socio-economic disadvantage	1.00	−0.10	−0.14	−0.10	−0.14	−0.30	−0.25	−0.36	
2. Parent cares if child skips school[a]	−0.69	1.00	0.79	0.74	0.92	0.35	0.26	0.30	
3. Parent cares if child gets a bad grade[a]	−0.54	0.79	1.00	0.83	0.80	0.35	0.27	0.32	
4. Parent cares if child doesn't finish homework[a]	−0.41	0.66	0.78	1.00	0.74	0.31	0.28	0.26	
5. Parent cares if child quits school[a]	−0.80	0.92	0.71	0.57	1.00	0.37	0.21	0.37	
6. Parent attends school events[a]	−0.60	0.66	0.55	0.60	0.76	1.00	0.66	0.41	
7. Parent attends school meetings[a]	−0.22	0.21	0.26	0.47	0.22	0.52	1.00	0.28	
8. Student expects to graduate from high school[a]	−0.61	0.51	0.55	0.47	0.63	0.66	0.38	1.00	
9. Cumulative promotion index	−0.57	0.54	0.49	0.45	0.67	0.70	0.31	0.63	1.00

Within districts correlation matrix is on upper diagonal, between districts correlation matrix is on lower diagonal

All correlations are significant, $p \leq .05$

Within districts, socio-economic disadvantage is the student's level of SES; between districts, socio-economic disadvantage is the district's level of concentrated disadvantage

[a] Within districts correlations involving these variables are polychoric, tetrachoric, or polyserial correlations
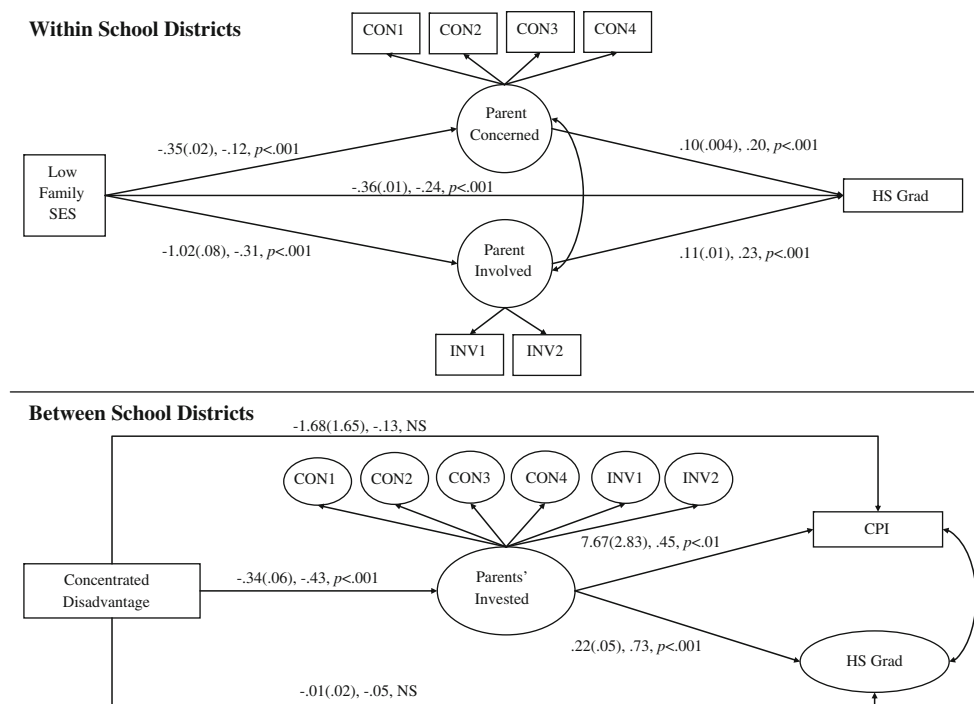

Fig. 1 Results of multilevel mediation model. Regression estimates are reported as: unstandardized regression coefficient (standard error), standardized regression coefficient. *NS* not significant. Within districts, parental involvement, parental concern, and high school graduation were regressed on age, gender, and race/ethnicity. Between districts, parents' investment, high school graduation expectations, and CPI were regressed on per pupil expenditure, pupil-teacher ratio, school size, region of the U.S., level of rurality, type of minority community (Mexican American community, African American community) and the average age of survey respondents. Double headed arrows represent residual correlations. Model Fit, χ^2 (118) = 4166.808, CFI = .991, TLI = .986, RMSEA = .023

Missing Data

In order to avoid losing cases with missing data on one or more of the variables in the model, and potentially biasing the estimates of the model, we employed multiple imputation to impute missing data. We created ten multiply imputed datasets using IVEware (Raghunathan et al. 2002). Analyses were run on each of the ten imputed datasets and the estimates were combined using the procedures outlined by Rubin (1987).

Results

Direct Effects

First we examined the effects of the socio-economic indicators on the educational outcomes without the inclusion of perceived parental investment. In this direct effects model, the Level 1 effect captures the *within districts* effect, that is, the extent to which a student's SES predicts their expectation to graduate from high school after adjusting for age, gender, and race/ethnicity. At Level 1, there is a significant effect: lower SES is associated with a lower expectation to graduate ($b = -.47$, $se = .01$, standardized $\beta = -.34$, $p < .001$).

The Level 2 model explains the *between districts* effects, the extent to which concentrated disadvantage predicts the district's overall ability to promote and graduate students (i.e., as measured by the CPI) and the average expectation to graduate from high school in the district. After adjusting for per-pupil expenditure, pupil teacher ratio, school size, region, level of rurality, minority community type, and the average age of the survey respondents, concentrated disadvantage is associated with both educational outcomes, indicating that higher levels of disadvantage are associated with a lower CPI ($b = -4.24$, $se = 1.28$, $\beta = -.33$, $p < .01$) and a lower average expectation to graduate from high school ($b = -.08$, $se = .02$, $\beta = -.37$, $p < .001$).

Mediated Effects

Next we added parental investment, the mediator, to the model. The results of the model are presented in Fig. 1. The model fits the data well as indicated by the practical fit indices in the figure caption. The standardized factor loadings for the indicators making up the parental investment constructs are all significant ($p < .001$) at Level 1 and 2: Level 1 parental concern (CON1 $= .92$, CON2 $= .90$, CON3 $= .84$, CON4 $= .93$), Level 1 parental involvement (INV1 $= .93$, INV2 $= .71$), and Level 2 parental investment (CON1 $= .96$, CON2 $= .82$, CON3 $= .82$, CON4 $= .99$, INV1 $= .96$, INV2 $= .64$).

Level 1 Mediation

First consider the mediation processes at Level 1, the within districts model. Perceived parental concern about academic achievement and parental involvement in school are significantly associated with low family SES after adjusting for the control variables. This constitutes the "a" effect in a mediation model (i.e., the antecedent predicting the mediator—see MacKinnon 2008) and indicates that youths from a lower SES family tend to report that their

parents have lower concern for their academic achievement and are less involved in the school as compared to youths from a higher SES family.

The "b" effects represent the relationship between the mediators and the outcome. As usual in multiple regression, these estimates represent the unique effect after adjusting for all other variables. For example, the regression coefficient for perceived parental concern represents the unique effect after adjusting for the control variables, low SES, and perceived parental involvement (i.e., the other mediator). Each effect is robust and statistically significant. Perceived parental concern and parental involvement are both significantly related to the expectation to graduate from high school. These effects indicate that students who report that their parents show greater concern for their academic achievement and that their parents are involved in school report a higher expectation to graduate from high school.

Indirect effects to assess the extent to which parental investment mediates the relationship between socio-economic indicators and educational outcomes were tested using the model constraint feature of Mplus, Version 6.0. Both indirect effects, defined as a*b, at Level 1 are significant: Low SES → Parent Concern → High School Graduation Expectations ($t = -13.75$, $p < .001$), Low SES → Parent Involved → High School Graduation Expectations ($t = -14.96$, $p < .001$). Following the protocol offered by Preacher and Hayes (2008), we formally tested the combined effect of the two mediators. The combined effect is statistically significant ($t = -20.33$, $p < .001$), indicating that there is a significant indirect effect of SES on the expectation to graduate from high school via these two parental investment variables. It is important to note that a direct effect of low SES on the expectation to graduate remains, indicating that the mediation is only partial. That is, part of the effect of low SES is explained by these parental investment variables, but another part is not. We calculated the percent of the effect of SES on the expectation to graduate that is mediated by the parental investment factors. These results indicate that 28% of the effect of family SES is mediated by parental investment.

Level 2 Mediation

Now consider the mediation effects at Level 2, the between districts model. Holding all other variables constant, the effect of concentrated disadvantage on perceived parental investment (i.e., the "a" effect) is robust and significant, indicating that communities with higher rates of concentrated disadvantage have lower average levels of perceived parental investment. We also find strong evidence for the "b" effect in the Level 2 mediation model. Perceived

parental investment is a significant predictor of both educational outcomes, indicating that communities with higher average levels of perceived parental investment have higher average levels of academic expectations for high school graduation and a higher CPI. The calculated indirect effects (i.e., a*b) for concentrated disadvantage on both educational outcomes via parental investment are statistically significant: CPI ($t = -2.55$, $p < .05$), high school graduation expectations ($t = -3.74$, $p < .001$). This indicates that the average level of perceived parental investment mediates the effect of concentrated disadvantage on the average expectation to graduate from high school and the district's CPI. Some 87% of the effect of concentrated disadvantage on the average expectation to graduate from high school is mediated by perceived parental investment and 60% of the effect of concentrated disadvantage on the CPI is mediated by perceived parental investment. The direct effect of concentrated disadvantage on these Level 2 educational outcomes is not significantly different from zero after inclusion of perceived parental investment in the model.

Discussion

School failure and eventual dropout are serious problems in and of themselves, and are also associated with many deleterious outcomes for the individual and their family—including higher rates of crime, incarceration, teen pregnancy, drug abuse, suicide, unstable employment, poor mental health, poor physical health, and low SES during adulthood (Bridgeland et al. 2006; Moretti 2005; Muennig 2005; Rouse 2005; Waldfogel et al. 2005). One of the most robust predictors of academic underachievement and failure to graduate from high school is low SES (Balfanz 2007; Civil Rights Project 2005; Hauser et al. 2004; Ingels et al. 2002); however, compared to studies focused on American cities, comparatively little research has assessed the relationship between socio-economic indicators and educational outcomes in rural America. In this study, we sought to assess the relationship between socio-economic indicators and educational outcomes at the individual and school district level among a large, national sample of youth residing in rural communities and towns. We hypothesized that a strong relationship between these two constructs would exist at each level, where students from lower SES families would report a lower expectation to graduate from high school and school districts in communities where concentrated disadvantage was more prevalent would have lower average high school graduation expectations among 7th to 9th grade students and the overall graduation rate (as defined by the CPI) in the district would be lower. Consistent with our hypotheses, socio-economic indicators are

substantially correlated with educational outcomes at each level of the model, and these effects are maintained after adjusting for important potential confounders. At Level 1, the individual level, lower SES students are less certain that they will eventually graduate from high school. At Level 2, the school district level, a greater degree of concentrated disadvantage in the community is associated with lower average high school graduation expectations as well as a lower estimated graduation rate. Indeed, the relationship between socio-economic indicators and educational outcomes appears to extend to rural communities and towns in the U.S.

This relationship between socio-economic indicators and educational outcomes has been long acknowledged, yet despite massive efforts put forth by federal programs, a much larger portion of low SES youth (as compared to mid and upper SES youth) continue to experience academic difficulties and drop out of school at a substantially higher rate (Sanders 2000). Given the central importance of educational attainment, understanding the origins of this problem is essential for developing effective policies and programs to change it. In this study, we sought to determine if perceived parental investment, a modifiable factor, would mediate (i.e., explain) the relationship between socio-economic indicators and educational outcomes.

The results of this study are consistent with our mediational hypotheses. For the individual, higher SES is associated with greater perceived parental investment and greater perceived parental investment is associated with a higher expectation to graduate from high school. Perceived parental investment accounts for about 28% of the effect of SES on the expectation to graduate from high school. Given that SES maintains a significant direct effect, perceived parental investment emerges as a partial mediator.

The multilevel analysis shows that perceived parental investment also mediates the relationship between concentrated disadvantage and educational outcomes at Level 2, the school district level. That is, concentrated disadvantage is negatively associated with perceived parental investment and perceived parental investment is positively associated with high school graduation expectations as well as the estimated graduation rate (i.e., the CPI). Across districts, the level of concentrated disadvantage and perceived parental investment are substantially correlated and, once perceived parental investment is accounted for, the effect of concentrated disadvantage on these academic outcomes is substantially reduced. In other words, perceived parental investment accounts for much of the relationship between concentrated disadvantage and the considered educational outcomes. There may, of course, be underlying factors involved, but if so, whatever it is about a community's level of concentrated disadvantage that influences dropout and high school graduation expectations, those same factors are

highly related to the perceived parental investment variables considered in this study.

A Cautionary Note

While the findings clearly show the critical importance of perceived parental investment in education, there is a considerable danger involved. It can be all too easy to "blame the parents," particularly when the parents are impoverished. Parental involvement with the schools is not a one-sided issue. It involves an interaction between the community, the school, and the parents. Although socio-economic factors and parental investment are correlated, particularly at Level 2, it is critically important to recognize possible reasons for this relationship. Higher socio-economic parents have more resources and are better able to afford investment and involvement with the school (Hoover-Dempsey et al. 2005). For example, it is far more difficult for a parent working two jobs, or a work schedule other than the typical eight to five, to attend parent-teacher conferences or other school events. Increasing parental involvement for economically struggling parents will require finding ways to overcome these barriers.

Parents who have the advantage of advanced education are likely to be more aware of the parental investment practices that result in better achievement for youth (e.g., providing supplementary learning experiences, assisting with homework, navigating the path towards graduation and postsecondary education). They may also feel more comfortable communicating or intervening with the school. Parents with less educational experience may feel less empowered, that is, less able to influence the school or their children's academic behaviors. These are problems that can and should be solved through parent-focused programs.

Lower SES families may feel unwelcomed or uncomfortable at school (Gonzalez-DeHass and Willems 2003), and it is imperative to recognize that low parental involvement may be influenced by factors that are external to the family (e.g., an inhospitable school climate, rigid policies that may exclude the participation of some families, language or cultural barriers). As such, in thinking about the role of parental investment in promoting academic achievement, we must acknowledge that there are many factors that influence the extent to which a parent demonstrates investment in his or her child's education, some that are directly related to the parent and some that are outside of the parent's control.

Limitations

Before discussing the implications of these results, it is important to identify the limitations. First, all variables measured at Level 1 were self-reported by the student and the adolescent's perceptions of their parents' parental investment may not actually reflect the true investment of the parent. However, that perceived parental investment is strongly related to academic expectations and, if there are differences between perception and reality, their perception of parental investment may indeed be more important than the actual investment. Second, our measures of parental investment are limited to two components—perceived parental involvement in school and perceived parental concern about the child's achievement (e.g., parent cares that child completed homework). However, the literature on parental investment identifies many aspects of investment (Hoover-Dempsey et al. 2005), and this study is limited in that it only considers two of these constructs. Moreover, the measures of parental involvement represent only two possible forms of parental involvement in school programs, meetings, and activities. Related, given the cross-sectional nature of this study, we are unable to know if parental involvement influences student participation in school activities or if student participation in activities influences parental involvement. Third, neither actual measures of academic achievement (e.g., Grade Point Average) nor actual dropout of individual students is available in this study. Therefore, we must rely on academic expectations for graduation and an estimate of the district's graduation rate. Despite these limitations, the findings may have important implications for improving academic outcomes.

Implications for Prevention

A great deal of research demonstrates that the relationship between socio-economic indicators and educational outcomes is large and robust (Civil Rights Project 2005; Hauser et al. 2004; Ingels et al. 2002) and in this study we confirm that this relationship also exists in rural America. While eliminating socio-economic disparities must be a priority, these results show that, in terms of the effect on the individual student, perceived parental investment in school mediates a substantial portion of the effect of SES. This study adds to the conviction that parents play a critically important role in the academic achievement of their children (Hill and Taylor 2004; Hill and Tyson 2009). As a modifiable factor, parental investment in school is a viable target for prevention initiatives and successful interventions may have the power to lessen the achievement gap that currently exists as a function of socio-economic disparities, both for individuals and for school districts.

Efforts to enhance parental investment come in many forms and effective efforts are likely to require intervention at multiple points—e.g., school policies and programs to make school involvement more accessible to all parents, cultural competency training, community and workplace policies to support all parents' involvement in school, and

educational programs to help parents build their self-efficacy, skills, and resources to promote their child's achievement. Given the findings of previous studies (see Hill and Tyson 2009), the robustness of the results presented in this manuscript, and the No Child Left Behind Act of 2001 (2002) that requires schools to implement initiatives designed to promote parental involvement, a continued and even larger emphasis should be placed on enhancement of parental investment in school. This should come in the form of increased efforts to study existing parental investment programs, development and assessment of new parental investment programs, and implementation of policies that support family involvement in school.

Some of this work is already underway. For example, the Center on School, Family and Community Partnerships at Johns Hopkins University oversees the National Network of Partnership Schools (2010), a program that provides professional development training and technical assistance for communities to develop and enhance their family involvement and community connection initiatives. Many communities and districts across the nation have developed substantial parental involvement programs, and these communities can serve as models for others seeking to do the same. Likewise, Nancy Hill's work to identify best practices in enhancing parental investment during adolescence holds important practical advice for parents and schools. In a recent synthesis of the literature, Hill and Chao (2009b) summarized four best practices that have been consistently identified as effective parental investment strategies. These include clear and effective communication of academic expectations, laying plans for post-high school, augmentation or supplementation of instruction, and concerted effort to keep adolescents on track with their schoolwork. Hill and Chao (2009b) stress that parents should provide the scaffolding for adolescents to manage themselves in this way rather than micromanaging every detail. This will teach the adolescent to self-manage, a skill that will become critically important once the adolescent leaves home. In sum, these four best practices can serve as a foundation for the enhancement of parental investment, with clear intervention avenues targeted at parents, schools, and communities.

The results of this study suggest that perceived parental investment plays an important role in the relationship between socio-economic indicators and educational outcomes among adolescents living in rural communities and towns. As a modifiable factor, efforts to enhance parental investment may result in improved educational outcomes for youth, although experimental work is needed to determine if enhancement of parental investment will actually result in improved academic outcomes. Potential implications are apparent for the importance of societal support of school-family-community partnerships, research on programs that can enhance parental investment, and implementation of such programs.

References

Alliance for Excellent Education. (2010). *Current challenges and opportunities in preparing rural high school students for success in college and career: What federal policymakers need to know*. Washington DC.

Balfanz, R. (2007). The graduation rate crisis and what we can do about it: The Federal role in secondary school reform. Center for Social Organization of Schools, Johns Hopkins University. Testimony prepared for the Senate Committee on Health, Education, Labor and Pension hearing on NCLB reauthorization: Modernizing middle and high schools for the 21st Century, April 24, 2007.

Booth, A., & Dunn, J. F. (1996). *Family-school links: How do they affect educational outcomes?*. Mahwah, NJ: Lawrence Erlbaum Associates.

Bradley, R. H., Corwyn, R. F., Burchinal, M. R., McAdoo, H. P., & Coll, C. G. (2001). The home environments of children in the United States Part II: Relations with behavioral development through age thirteen. *Child Development, 72*, 1868–1886.

Brantlinger, E. (1992). Unmentionable futures: Post school planning for low-income teenagers. *The School Counselor, 39*, 281–291.

Bridgeland, J., Dilulio, Jr, J., & Morison, K. (2006). *The silent epidemic: Perspectives of high school dropouts*. Bill and Melinda Gates Foundation.

Civil Rights Project. (2005). *Confronting the graduation crisis in California*. Harvard University. Retrieved November 9, 2010, from http://www.civilrightsproject.ucla.edu/research/dropouts/dropouts05.pdf.

Coleman, J. S. (1990). *Foundations of social theory*. Cambridge, MA: Harvard University Press.

Crosnoe, R. (2001). Parental involvement in education: The influence of school and neighborhood. *Sociological Focus, 34*, 417–434.

Dearing, E., Kreider, H., Simpkins, S., & Weiss, H. B. (2006). Family involvement in school and low-income children's literacy performance: Longitudinal associations between and within families. *Journal of Educational Psychology, 98*, 653–664.

Diplomas Count. (2009). *Broader horizons: The challenge of college readiness for all students*. Bethesda, MD: Editorial Projects in Education.

Eccles, J. S., Wigfield, A., & Schiefele, U. (1998). Motivation to succeed. In W. Damon (Series Ed.) & N. Eisenberg (Vol. Ed.), *Handbook of child psychology: Social, emotional, and personality development,* (Vol. 3, pp. 1017–1095). New York, NY: Wiley & Sons, Inc.

Editorial Projects in Education Research Center. (2010). District Graduation Rate Map Tool [WWW page]. URL http://www.edweek.org/apps/maps/.

Epstein, J. L., & Sheldon, S. B. (2002). Present and accounted for: Improving student attendance through family and community involvement. *The Journal of Educational Research, 95*, 308–318.

Fan, X., & Chen, M. (2001). Parental involvement and students' academic achievement: A meta-analysis. *Educational Psychology Review, 13*, 1–22.

Gonzalez-DeHass, A. R., & Willems, P. P. (2003). Examining the underutilization of parent involvement in the schools. *School Community Journal, 13*(1), 85–99.

Grilli, L., & Rampichini, C. (2007). Multilevel factor models for ordinal variables. *Structural Equation Modeling, 14*, 1–25.

Grolnick, W. S., & Slowiaczek, M. L. (1994). Parents' involvement in children's schooling: A multidimensional conceptualization and motivational model. *Child Development, 63*, 237–252.

Hauser, R. M., Simmons, S. J., & Pager, D. I. (2004). High school dropout, race-ethnicity, and social background from the 1970s to the 1990s. In G. Orfield (Ed.), *Dropouts in America: Confronting the graduation rate crisis*. Cambridge, MA: Harvard Education Press.

Hawkins, J. D., & Weis, J. G. (1985). The social development model: An integrated approach to delinquency prevention. *Journal of Primary Prevention, 6*, 73–97.

Hill, N. E., & Chao, R. K. (2009a). Background in theory, practice, and policy. In N. E. Hill & R. K. Chao (Eds.), *Families, schools and the adolescent: Connecting research, policy, and practice* (pp. 1–15). New York, NY: Teachers College Press.

Hill, N. E., & Chao, R. K. (2009b). Recommendations for developmentally appropriate strategies for parental involvement during adolescence. In N. E. Hill & R. K. Chao (Eds.), *Families, schools and the adolescent: Connecting research, policy, and practice* (pp. 195–207). New York, NY: Teachers College Press.

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

Hill, N. E., & Tyson, D. F. (2009). Parental involvement in middle school: A meta- analytic assessment of strategies that promote achievement. *Developmental Psychology, 45*, 740–763.

Hoover-Dempsey, K. V., Ice, C. L., & Whitaker, M. C. (2009). We're way past reading together: Why and how parental involvement in adolescence makes sense. In N. E. Hill & R. K. Chao (Eds.), *Families, schools and the adolescent: Connecting research, policy, and practice* (pp. 195–207). New York, NY: Teachers College Press.

Hoover-Dempsey, K. V., & Sandler, H. M. (1997). Why do parents become involved in their children's education? *Review of Educational Research, 67*(1), 3–42.

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

Ingels, S. J., Curtin, T. R., Kaufman, P., Alt, M. N., & Chen, X. (2002). *Coming of age in the 1990s: The eighth-grade class of 1988 12 years later. (NCES 2002–321)*. Washington, DC: U.S. Department of Education, National Center for Education Statistics.

Kao, G., & Tienda, M. (1988). Educational aspirations of minority youth. *American Journal of Education, 106*, 349–385.

Lareau, A. (2004). *Unequal childhoods: Class, race, and family life*. Berkeley, CA: University of California Press.

MacKinnon, D. P. (2008). *Introduction to statistical mediation analysis*. Mahwah, NJ: Erlbaum.

McLoyd, V., & Jozefowicz, D. (1996). Sizing up the future: Predictors of African-American adolescent females' expectancies about their economic fortunes and family life course. In B. Leadbeater & N. Way (Eds.), *Creating identities, resisting stereotypes: Urban adolescent girls*. New York: University Press.

Mello, Z. R. (2009). Racial/ethnic group and socioeconomic status variation in educational and occupational expectations from adolescence to adulthood. *Journal of Applied Developmental Psychology, 30*(4), 494–504.

Moretti, E. (2005). Does education reduce participation in criminal activities? In H. M. Levin (Chair), Symposium on the social

costs of inadequate education. Symposium conducted at Teachers College, Columbia University, New York.

Muennig, P. (2005). Health returns to education interventions. In H. M. Levin (Chair), Symposium on the social costs of inadequate education. Symposium conducted at Teachers College, Columbia University, New York.

Muthén, L. K., & Muthén, B. O. (2007). *Mplus user's guide* (5th ed.). Los Angeles, CA: Muthén & Muthén.

National Network of Partnership Schools. (2010). Retrieved November 19, 2010, from http://www.csos.jhu.edu/p2000.

No Child Left Behind Act of 2001. Pub. L. No. 107–110, § 9101, 115 Stat. 1425. (2002).

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods, 40*, 879–891.

Preacher, K., Zyphur, M., & Zhang, Z. (2010). A general multilevel SEM framework for assessing multilevel mediation. *Psychological Methods, 15*(3), 209–233.

Raghunathan, T. E., Solenberger, P. W., & Van Hoewyk, J. V. (2002). IVEware: Imputation and variance estimation software user guide. *Survey Methodology Program*. Institute for Social Research, University of Michigan.

Rouse, C. E. (2005). The labor market consequences of an inadequate education. In H. M. Levin (Chair), *Symposium on the social costs of inadequate education*. Syposium conducted at Teachers College, Columbia University, New York.

Rubin, D. B. (1987). *Multiple imputation for nonresponse in surveys*. New York, NY: Wiley.

Rumberger, R., & Arellano-Anguiano, B. (2004). Understanding and addressing the California Latino achievement gap in early elementary school. Working paper. Retrieved from http://www.lmri.ucsb.edu/publications/04_rumberger-arellano.pdf.

Sanders, M. G. (2000). Preface: Research, policy, and practice in the education of poor and minority adolescents. In M. G. Sanders (Ed.), *School students placed at risk: Research, policy, and practice in the education of poor and minority adolescents (xv-xxi)*. Mahwah, NJ: Lawrence Erlbaum Associates.

Stanley, L. R., Comello, M. L. G., Edwards, R. W., & Marquart, B. S. (2008). School adjustment in rural and urban communities: Do students from "Timbuktu" differ from their "City Slicker" peers? *Journal of Youth and Adolescence, 37*(2), 225–238.

St-Hilaire, A. (2002). The social adaptation of children of Mexican immigrants: Educational aspirations beyond junior high school. *Social Science Quarterly, 83*, 1026–1043.

Swanson, C. B. (2004a). *Graduation rates: Read kids, real numbers*. Washington, DC: Urban Institute.

Swanson, C. B. (2004b). *Keeping count and losing count: Calculating graduation rates for all students under NCLB accountability*. Washington, DC: Urban Institute.

Waldfogel, J., Garfinkel, I., & Kelly, B. (2005). Public assistance programs: How much could be saved with improved education? In H. M. Levin (Chair), *Symposium on the social costs of inadequate education*. Symposium conducted at Teachers College, Columbia University, New York.

Zehr, M. A. (2010). Rural "dropout factories" often overshadowed. *Education Week, 29*(27), 16–17.

Author Biographies

Kimberly L. Henry is an Assistant Professor in the Psychology Department at Colorado State University. She received her Ph.D. in Biobehavioral Health from the Pennsylvania State University in 2002. Her research focuses on positive youth development, school engagement, youth risk behaviors, and innovative models for multilevel data.

Thomas M. Cavanagh is a graduate student in the industrial/ organizational psychology department at Colorado State University. His major research interests include statistical methodology, training, and cognitive aging.

Eugene R. Oetting is professor emeritus at Colorado State University where he chaired the Counseling Psychology Program and was the founder and Scientific Director of The Triethnic Center for Prevention Research, a Center devoted to the study of the problems of disadvantaged and underserved populations. He received his PhD in Psychology from the University of Wisconsin in 1959.