Facing an Uncertain Future:
Aspirations and Achievement of Rural Youth

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Abstract

Rural high school students face many challenges as they prepare for the future. Using longitudinal data from the Educational Longitudinal Study of 2002, the purpose of this study is to examine the influence of socioeconomic status, residential preferences, and schooling experiences on the educational expectations and achievement of rural youth. The study draws on social cognitive theory to test the role of students' self-efficacy beliefs as mediators of environmental and personal influences on achievement outcomes. The results support a mediation model for educational plans, whereas socioeconomic status and curriculum program had both direct and indirect effects on mathematics achievement. Implications for the development of rural youth will be discussed.

One-third of America's youth attend rural public schools (Provasnick et al., 2007). These schools, and the youth they serve, face a number of significant challenges today. A high proportion of rural youth, particularly racial and ethnic minorities are poor (Ley, Nelso, & Belyukova, 1996, Save the Children, 2002, Provasnick et al., 2007). National reports also indicate that rural youth, as a group, have lower achievement scores, lower high school completion rates, and lower college attendance rates than nonrural youth (Brookings Institution, 2003; Provasnik et al., 2007). Due to limited resources, curricular options, and teacher shortages, rural youth are often less prepared than nonrural youth for the transition to work or postsecondary education (Provasnick et al., 2007). Additionally, rural communities have experienced significant economic changes in the last two decades due to declining low-skill employment opportunities in agricultural, mining, construction, and manufacturing industries (Gibbs, Kusmin, & Cromartie, 2005). Therefore, many rural areas are losing their most talented youth to metropolitan areas offering a broader range of employment opportunities than those found in the local labor market of most rural communities (Elder & Conger, 2000; Farmer et al., 2006).

Rural youth clearly face a number of important challenges and uncertainties as they prepare for the future. Yet, in the last two decades, few studies have focused on rural youth as they prepare for the transition to early adulthood. The present study examined the education plans and achievement of rural youth in the last year of high school. The study used data from the Educational Longitudinal Study of 2002 (ELS: 2002) to document (a) the educational aspirations of rural youth for the future, (b) the level of college readiness of rural youth based on mathematics proficiency; and (c) the role of personal, family, and school experiences in explaining variations in the educational attainment of rural youth.

Background of Study

Educational Aspirations and Achievement as Predictors of Postsecondary Transitions

This study focused on two key determinants of young people's subsequent career choices, college enrollment, educational attainment, and lifetime earnings. Defined as a desired outcome or goal, numerous studies indicate that adolescents' educational aspirations are strongly linked to future educational attainment, occupational aspirations, and career choices (Bandura, 1986; Bandura, Barbaranelli, Capara, & Pastorelli, 1996; Eccles, Wigfield, & Schiefele, 1998, Lent, Brown, & Hackett, 1994; Rojewski, 1999). Similarly, mathematics achievement and proficiency has long been regarded as a "critical filter" that can enhance or restrict future educational and occupational opportunities of youth. (Balfanz & Byrnes, 2006; Eccles, 1987; Meece, 2006; U.S. Department of Education, 1997). Higher achievement in mathematics is related to college attendance and completion (ACT, 2008, Allen & Sconing, 2005; Shapka, Domene, & Keating, 2006), as well as to jobs or careers in math-related fields with better income, job security, and benefits (Eccles, 1987; Lichtenwalter, 2005; Meece, 2006).

Challenges Facing Rural Youth

As described earlier, rural youth face a number of important challenges that may affect their educational aspirations and academic achievement. Existing evidence indicates that rural youth tend to have lower educational expectations (Cobb, McIntire, & Pratt, 1989; Haller & Vickler, 1993; Hansen & McIntire, 1989; Sarigiani, Wilson, Petersen, & Vicary, 1990). These discrepancies are attributed to a wide range of conditions that combine to restrict the educational aspirations of rural youth. Compared with their peers in metropolitan areas, rural youth have a greater likelihood of experiencing a narrow school curriculum, a shortage of teachers with advanced degrees, limited access to career counseling and college preparatory programs, limited

resources to increase school retention, fewer professional role models, and restricted employment opportunities in their local communities (Haller & Virkler, 1993; Lapan Tucker, Kim, & Kosciulek, 2003). The aspirations of rural youth are also greatly affected by the higher rates of poverty found in rural communities (Ley, Nelson, & Beltyukova, 1996; Irvin, Petersen, Meece & Farmer, 2009). In addition, many rural youth experience a conflict between remaining close to family and friends versus relocating to pursue higher education and career opportunities not available in their local communities (Elder, King, & Conger, 1996; Farmer et al., 2006; Hektner, 1995; Howley, 2006).

With regards to mathematics education, data based on national assessments also suggest that rural youth are not achieving at the same level of mathematics proficiency as metropolitan high school students (Provasnik et al., 2007). Few studies have examined factors contributing to these discrepancies. However, recent evidence suggests that rural youth may not have the same access to upper level mathematics courses as more urban youth. For rural schools, advanced high school courses are among the hardest to staff, especially in the area of mathematics (Peske & Haycock, 2006; Provasnik et al., 2007). The distance from urban areas, low salaries, and competition from other districts are all factors that make it difficult for rural schools to attract and retain highly qualified teachers (Gándara, Gutiérrez, & O'Hara, 2001; Monk, 2007). A limited access to advanced high school mathematics courses may serve to limit the development of mathematics proficiency among rural youth.

In addition, most studies on the educational aspirations and mathematics achievement of rural youth lack a theoretical framework to guide research. Even fewer studies have used a longitudinal design (see also Irvin et al., 2009). To address shortcomings in previous research, the present study is guided by both a social cognitive framework (Bandura, 1986) and recent

research viewing schools as developmental contexts (Eccles & Roeser, 2003). It also included a longitudinal component examining the role of school, family, and personal influences in 10th grade as predictors of educational aspirations and achievement in their senior year of high school.

Guiding Framework of Study

Grounded in a social cognitive framework of development (Bandura, 1986), this study examined the relation of personal and environmental influences on the educational aspirations and achievement of rural youth. This study defines students' educational aspirations as a set of expected realistic educational plans (Kao & Tienda, 1998, Mau, 1995, Mau & Biko, 2000), rather than a youth' s idealistic goal pursuit (Wilson, et al., 1993). In keeping with a social cognitive perspective, students' efficacy-related beliefs are hypothesized to be an important mediator of the influence of family socioeconomic status, residential preferences, and schooling experiences on educational aspirations and mathematics achievement. The study also draws upon recent studies documenting the role of schools in youth development (Eccles & Roeser, 2003). This research has shown that proximal influences, such as school climate, high school program enrollment, and teacher expectations, have a significant impact on students' achievement, academic motivation, educational plans, and career choices (Eccles, 2004; Eccles & Roeser, 2003).

The theory guiding this study draws mostly on research on metropolitan youth. These studies indicate a clear relation of poverty, low-income status, and socioeconomic status to educational attainment and achievement. Children and youth from more socioeconomically disadvantaged backgrounds tend to have lower academic achievement and lower educational expectations (e.g., Bandura et al., 2001; Conger, Conger, & Elder, 1997; Hansen & McIntire,

1989; McLoyd, 1998; Sirin, 2005; Smith, Brooks-Gunn, & Klebanov, 1997). Aspects of youth's experiences in schools, too, have been shown to relate to educational outcomes (e.g., Eccles & Roeser, 2003; National Research Council and Institute of Medicine, 2004). Specifically two dimensions of school climate, academic emphases and positive interpersonal relations, are positively related to youth's self-beliefs and their educational attainment (Lee, 2000; Lee, Smith, Perry, & Smylie, 1999; Meece, Anderman, & Anderman, 2006; National Research Council and Institute of Medicine, 2004). Additionally, research suggests that achievement outcomes of youth are enhanced when teachers report taking more responsibility for students' learning (Lee, 2000) and report more positive beliefs about their ability to influence students' academic outcomes (Bandura, 1993). Finally, prior research documents an association between high school program enrollment and achievement patterns, with youth in more academically-oriented programs demonstrating higher levels of achievement and reporting higher educational expectations (e.g., Lee & Bryk, 1988; Mau & Bikos, 2000; Vanfossen, Jones, & Spade, 1987).

To expand this research to rural youth, the present study added a measure of residential preferences. Prior research has demonstrated that rural youth may experience a conflict between the desire to remain within or near their local communities and to pursue educational and career opportunities elsewhere (Cobb et al, 1989; Elder et al., 1996; Rojewski, 1999). Rural youth who prefer to remain near their families and communities tend to have lower levels of academic achievement and aspirations for college attendance than youth reporting a willingness to relocate (Johnson et al., 2005). Thus, residential preferences were examined in this study as a possible influence on rural adolescents' educational expectations and mathematics achievement.

Guided by prior research on rural youth and social cognitive theory, this study addressed following questions:

1. What percent of rural youth plan to complete high school, attend college, or obtain a professional degree?
2. Are rural students' educational expectations and mathematics achievement significantly related to family socioeconomic status?
3. How do residential preferences influence rural students' educational plans or mathematics achievement?
4. What role do schooling experiences (academic press, relational context, teacher beliefs about student success, and high school program enrollment) play in rural students' educational expectations and mathematics achievement?
5. Do mathematics self-efficacy beliefs mediate the relations of schooling influences and socioeconomic status on educational expectations and mathematics achievement?

Methods

This study used data available in the U.S. Department of Education's ELS conducted in 2002 and 2004. The ELS: 2002 surveyed over 15,000 high school students, 13,488 parents, 7,135 teachers, and 743 principals. The intent of the ELS study was to follow a cohort of 10th grade students into 12th grade, then conduct a third follow-up two years after high school. The present study utilized data from the 10th grade (2002) and 12th grade (2004) administrations and limits analyses to data from students attending rural, public schools only. The study provided a longitudinal component by examining environmental and personal influences as measured during youth's 10th grade year for their relation to students' educational expectations and mathematics achievement during their senior year of high school. Using structural equation modeling analyses, the study examined a partial mediation model that was proposed to explain the relations among environmental, personal, and behavioral factors (See Figure 1 and Figure 2).

Participants

The sample included the 2,095 rural, public high school students who completed surveys in both 2002 and 2004, had a mathematics achievement test score, and provided a response other than "don't know" to the educational expectations question.[2] Approximately half of the student sample (51%) were female and 25% of the students were in the lowest quartile of socioeconomic status based on U.S. Department of Education estimates. The self-reported racial or ethnic background of the sample was: 77% White, 8.5% Black or African American, 6.3% Latino or Hispanic, 3.5% Multiracial, 3.4% Asian or Pacific Islander, and 1.4% American Indian or Alaska Native. Parents of the participants varied with regards to educational levels. Thirty-percent of the parents had completed college or obtained an advanced degree, and 26% had obtained a high school diploma or GED. Only a small percent (3.6%) of the parents indicated they had not completed high school. Survey results from teachers who taught math to one or more study participants were included, as well as information from the school administrator survey from each school with participating students.

Measures

The study's analyses included two outcome variables (educational expectations and mathematics achievement), five latent factors and one observed variable used as predictors (Socioeconomic Status, Geographic Residential Preference, Academic Press, Relational Context of the Schools, Mathematics Teacher Beliefs about Student Success, and High School Program Enrollment), and one mediating variable (Mathematics Self-efficacy Beliefs). The measures are described below.

[2] There were 231 students (or about 9%) of the 2491 rural students enrolled in public schools who answered "don't know" to the educational expectation question. These students were eliminated from the analyses due to the impossibility of assigning a rank-order value for "don't know" versus the other response possibilities from "dropout" to "M.D." Information about this group is available from the first author.

Educational expectations. One outcome variable for the study was how much education students expected to complete. This information was collected in 2004, when most of the participants would have been in Grade 12. Using a scale from less than high school to Ph.D. or advanced degree, students were asked to indicate their plans for their education ("As things stand now, how far in school do think you will get?"). For analysis purposes, educational plans were treated as a continuous variable.

Mathematics achievement. The second dependent variable, mathematics achievement, was based on a mathematics test administered to students participating in ELS: 2004 (12^{th} Grade). The test includes items from the National Educational Longitudinal Study: 1988 (NELS:88), the National Assessment of Educational Progress (NAEP), and the Programme for International Student Assessment (PISA). It included 40 open-ended and multiple choice items to assess students' proficiency at five mastery levels from simple mathematical operations (multiplication, division) to advanced mathematics (evaluation of functions). The measure used in this study represents the math standardized T score, as provided in the Electronic Code Book (ECB) for ELS: 2002 and 2004.

Socioeconomic status. This study included a latent factor for SES, with one reflective indicator. The indicator was a composite variable in the ELS: 2002 as created by the U.S. Department of Education. The measure consists of five, equally-weighted items that included both parents' educational level, both parents' occupation, and total family income.

Geographic residential preference. Two items from the survey students completed in Grade 10 were used to create a latent construct for geographic mobility. The items included the importance of (a) living near parents and relatives, and (b) getting away from this area of the country. Students' responses ranged from *Not Important* (1) to *Very Important* (3).

Academic press. A latent factor representing the degree to which academics were emphasized within the school was constructed and used as a predictor variable in the model. Three items that were taken from the 2002 school administrator survey were used as reflective indicators for this factor (e.g., "Teachers at this school press students to achieve academically"). School administrators were asked to rate the accuracy of the items on a five-point Likert-type scale ranging from 1 = *not accurate at all* to 5 = *very accurate*.

Relational context of the schools. A latent factor representing the degree to which students had positive experiences of the relational contexts of their schools was included as a predictor in the model. Four items taken from the 2002 student survey were included as reflective indicators of the factor. The four items were: a) "Students get along well with teachers;" b) "There is real school spirit;" c) "Students make friends with students of other racial and ethnic groups;" and d) "Teachers are interested in students." Students responded by providing a rating on a four-point Likert-type scale ranging from 1 = *strongly agree* to 4 = *strongly disagree*. The four items were reverse-coded, such that higher scores indicated a stronger agreement for the item.

Mathematics teacher beliefs about student success. A latent factor representing mathematics teachers' beliefs about their role in students' success in schools was used as a predictor variable in the model. Three items taken from 2002 mathematics teacher surveys were used as reflective indicators for this factor. The items asked teachers about the importance of the following items to students' success: a) teacher's attention to the unique interests and abilities of the student; b) teacher's use of effective methods of teaching; and c) teacher's enthusiasm or perseverance. Teachers rated each item on a scale ranging from 1 = *extremely important* to 4 = *not at all important*. The items were reverse coded for the analyses such that higher scores

indicated higher importance for each item.

High school program enrollment. A single observed variable representing students' 2002 high school program enrollment was used as a predictor in the model. Students were asked to identify their *high school program* (general education, college preparatory, or vocational education). This variable was represented by a single dummy variable where general education and vocation education were coded as "0," and college preparatory was coded as "1."

Mathematics self-efficacy beliefs. A measure of self-efficacy beliefs related to mathematics was included in the study as a mediator of environmental influences (socioeconomic status and schooling experiences) on educational expectations. A latent construct was created based on five items on the survey completed by the students in Grade 10. Examples include "I am confident I can understand the most difficult material presented by my math teacher," and "I'm confident I can do an excellent job on my math assignments."

Results

Estimation of Measurement Model[3]

Several variables included in theoretical model guiding this study were assessed as latent constructs shown in Figures 1 and 2. All factors were retained for testing in the structural equation model analyses. Although two factors had low reliability estimates (Relational Context of Schools, .60; Geographic Residential Preference, .39), based on coefficient H (Hancock & Mueller, 2001), they were retained for further analyses based on prior research that supports their relation to the outcomes of interest in this study (Bryk & Driscoll, 1988; Crosnoe, Johnson, & Elder, 2004; Elder et al., 1996; Hektner, 1995; Howley, 2006; Johnson et al., 2005; Lee & Smith, 1999; Rojewski, 1999; Wood, Kaplan, & McLoyd, 2007). Findings for these two factors are qualified by the low reliability and are in need of further study.

[3] A full description of analyses conducted to establish the measurement model is available from the first author.

Descriptive Statistics of Educational Aspirations and Mathematics Achievement

Descriptive analyses were performed on the dataset for the rural, public school students (n = 2,095) using SPSS 15.0. The analyses indicated that a large proportion (90%) of the 12th-grade rural students surveyed in the ELS study planned to continue their education beyond high school. Thirty-five percent planned to graduate from a four-year college and another 20 percent of the students planned to obtain a Master's degree or equivalent. Only 9% of the 10th graders indicated they were unsure of their educational plans and less than 1% reported plans to drop out of high school.

Results of Modeling Procedures

Structural equation modeling procedures, in Mplus Version 5.0 with MLR as the estimator, were used to evaluate the theoretical models guiding this study. Results varied depending on the outcome examined. The final model for educational expectations (See Tables 1-2 and Figure 3) accounted for 23% of the variance in 12th grade educational expectations. The model results indicated that students' Mathematics Self-efficacy Beliefs were an important mediator of the effects of Socioeconomic Status, High School Program, and the Relational Context of the School on students' self-reported educational plans for the future. Grade 10 Mathematics Self-efficacy Beliefs was a significant predictor of Grade 12 educational expectations. Measures of Academic Press and Mathematics Teachers' Beliefs about Student Success did not emerge as significant predictors of Mathematics Self-efficacy Beliefs or educational expectations.

For mathematics achievement, the final model (See Tables 3-4 and Figure 4) accounted for 30% of the variance in 12th grade student mathematics achievement. In the mathematics achievement model, Mathematics Self-efficacy Beliefs were also found to be an important

mediator of Socioeconomic Status, High School Program, and Relational Context of the School. In addition, both High School Program and Socioeconomic Status had a direct relation to mathematics achievement. Nearly half (52%) of the students surveyed indicated they were enrolled in a college preparatory program, while the remaining students were enrolled in a general curriculum (37%) or vocational program (10%). Grade 10 Mathematics Self-efficacy Beliefs was a significant predictor of Grade 12 mathematics achievement. As before, the Academic Press within the school and Mathematics Teachers' Beliefs about Student Success were unrelated to Mathematics Self-efficacy Beliefs and mathematics achievement. In contrast to the model for educational expectations, students' Geographic Residential Preference was not related to their mathematics achievement.

Discussion and Implications

Previous research suggests that educational aspirations and educational expectations have significant implications for future educational attainment, career choices, and lifetime achievement (Eccles et al., 1998, Kao & Tienda, 1998; Hardre, Crowson, Debacker, & White, 2007; Lent et al., 1994; Meece, 2006; Rojewski, 1999; Trusty & Harris, 1999; Wilson et al., 1993, Wood et al, 2007). The study used data collected as part of ELS 2002 and 2004 and provides a relatively current portrait of youth rural as the make the transition to early adulthood. The study's finding indicated that rural youth today have relatively high expectations for educational attainment. A majority of rural youth today plan to graduate from a four-year college (34%) or obtain an advanced degree (30%). These estimates are comparable to those for urban and suburban youth (U.S. Department of Education 2005), and demonstrate an increase in the educational expectations of rural youth over the last 25 years. Using High School and Beyond 1980 data, Cobb et al. (1989) reported that 23% of 10^{th} graders planned to obtain a high school

diploma, 23% planned to graduate from a four-year college, and only 12% planned on graduate study (p.13).

While the expectations data indicate that more rural youth today will be continuing their education beyond high school, the results of the mathematics assessments raise concerns about their level of mathematics preparation. Results revealed the mean scores of 12th grade rural students in the ELS 2002 study were around the sample mean of 50 for all 12th students. When examining levels of mathematics proficiency on the ELS mathematics assessment, approximately 35% of rural youth demonstrated intermediate mathematics proficiency by 12th grade, and only 3% of rural students demonstrated a mastery of advanced mathematics (U.S. Department of Education, 2005). Thus these data suggest that rural youth may not have the level of advanced mathematics preparation needed for college enrollment and completion. As described earlier, rural schools have difficulty attracting and retaining highly qualified teachers, especially in the areas of mathematics (Gandara et al., 2001, Monk, 2007: Peaske & Haycock, 2006; U.S. Department of Education, 2005), and rural schools are less likely to offer advanced mathematics courses than suburban or urban schools (Provasnik et al., 2007).

The study used a social cognitive framework to examine the relations of socioeconomic conditions, schooling experiences, and residential preferences on rural youth's educational expectations and mathematics achievement. In keeping with social cognitive theory, self-efficacy beliefs were included in modeling procedures as an important mediator of environmental and personal influences on achievement-related outcomes; however, several direct relations were proposed as well (see Figures 1 and 2). Overall, the models shown in Figures 1 and 2 accounted for 23% and 30% of the variance in rural youth's educational expectations and mathematics achievement, respectively.

Consistent with social cognitive theory, the analyses revealed that mathematics self-efficacy beliefs[4] were significantly and positively related to both youth's educational expectations and mathematics achievement. Additionally, mathematics self-efficacy beliefs also served to partially mediate the influence of socioeconomic status and high school program enrollment on rural youth's educational expectations and mathematics achievement. Similarly, the influence of relational context of the school was mediated by youth's mathematics self-efficacy beliefs. For this aspect of the school context, there was full mediation for the relation to mathematics achievement and partial medication for the relation to educational expectations. These findings are consistent with the research of Bandura (2001) showing that SES explains behavioral outcomes through its influence on self-efficacy beliefs. Similarly, motivation and tracking researchers have discussed the negative consequences of high school curricular programs on competency-related beliefs and achievement-related outcomes (Eccles, 2004; Eccles & Roeser,2003; Oakes et al., 1992).

Prior research linking SES to education-related outcomes in youth guided the inclusion of this predictor in the study (Conger et al., 1997; Hansen & McIntire, 1989, McLoyd, 1998, Sirin, 2005). Consistent with prior research, the present study identified a direct relation between SES and both achievement-related outcomes examined. In fact, when direct and indirect effects were taken into account, SES explained the largest share of the variance in students' educational expectations and mathematics achievement as assessed in 12th grade. Rural students from lower incomes families reported lower educational expectations and received lower mathematics scores. Due to declining resources, rural schools may be particularly challenged to serve the

[4] A measure of mathematics self-efficacy beliefs was used based on previous research suggesting that domain-specific beliefs are more predictive for specific academic achievement domains such as mathematics) Bandura, 1997; Pajares & Miller, 1994).

educational needs of children from low-wealth families (Save the Children, 2002, Farmer et al., 2004,2006; Vernon-Feagans, Gallagher, & Kainz, in press).

The students' high school program in 10th grade was also directly related to their mathematics achievement and educational plans by the end of high school. Self-efficacy beliefs only partially mediated the influence of high school on these achievement outcomes. These findings support research showing that high school students enrolled in more academically-oriented programs have stronger achievement-related outcomes, including standardized achievement, educational expectations, and achievement motivation (e.g., Eccles & Roeser, 2003; Lee & Bryk, 1988; Mau & Bikos, 2000, Mickelson & Heath, 1999; Oakes, 2005). To date, few studies (Rojewski, 1999) have examined the influence of curricular tracking in rural schools. Additional research is needed to better understand the processes by which curricular tracking limits the educational attainment of rural youth.

In addition, the residential preferences of rural youth had a small influence on rural youths' educational aspirations but no relation to their mathematics achievement. This finding is consistent with prior research (Elder et al., 1996, Johnson et al., 2005, Rojewski, 1999) demonstrating a positive relation between youths' achievement and desire to relocate from their local community. With limited economic opportunities in some rural communities, residential preferences may play a greater role in the prediction of future educational and occupational opportunities for rural youth.

Contrary to expectations, two aspects of the school context did not aid in the prediction of rural youth's educational expectations and mathematics achievement. Studies of urban schools have shown that a strong emphasis on academics and learning (i.e., Academic Press) positively influences student academic engagement and achievement (e.g., Eccles & Roeser, 2003; Finn,

1989; 1993; Lee et al., 1999). Similarly, research of urban youth has demonstrated the importance of teachers' beliefs about student success in explained variations in achievement outcomes. For example, Lee (2000) reported that when teachers take responsibility for student learning, student academic achievement is higher and less related to students' backgrounds. The most likely explanation for these inconsistencies in findings is the measurement of academic press and teachers' beliefs about student success in the present study. Whereas other studies have used student and/or teacher reports of Academic Press, this study used a school-administrator reported measure. Proponents of ecological models of development emphasize the importance of individual perceptions of environments and experiences (e.g., Bronfenbrenner, 1977). Similarly, motivation researchers have discussed the importance of students' perceptions of their classroom and school environments as predictors of achievement-related outcomes (Meece et al., 2006; Meece et al., 2003; Schunk & Meece, 1992; Urdan, Midgley, & Anderman, 1998). Students' perceptions of teaching practices often differ from teacher-reported data (Meece et al., 2006). Therefore, the lack of a student-reported measure of Academic Press and Teachers' Beliefs about Student Success may explain the lack of significant findings in this study. Consistent with this explanation, adolescents' responses to survey items assessing the relational context of their schools were significantly related to the outcomes assessed in the study.

Study Limitations

This study is the first to examine the aspirations and achievement of rural youth in the *Educational Longitudinal Study of 2002* and 2004 follow-up study. The study was guided by a social cognitive and ecological framework of youth development. Nevertheless, the study has several limitations. Given space limitations, the major ones include (a) the use of a secondary dataset; (b) the lack of school-level variables to assess the impact of variations across rural

schools and communities; (c) the low reliability of findings related to two latent constructs (Geographical Residential Preference and Relational Context of Schools), (d) the self selection bias of students returning informed parental consent, and (e) the exclusion of students who were unsure of their educational plans for the future and students who left school by their sophomore year. Additionally, the study did not control for prior achievement. It is acknowledged that students' early achievement histories in the elementary and intermediate grades shape achievement trajectories in high school. Some evidence suggests that the expectations of low income youth may be fairly stable by Grade 10 (Kao & Tienda, 1998). Additionally, it is acknowledged that rural schools differ greatly in demographic characteristics. Future researchers need to examine potential moderators of the relations examined in this study, including the effects of race and ethnicity, gender, and SES (see Irvin et al., 2009).

Conclusions

The study used a nationally representative sample to examine personal and school-related influences on the educational plans and mathematics achievement of rural youth. The independent variables examined (socioeconomic status, residential preferences, and school-related experiences) were assessed at Grade 10 and used to predict students' mathematics achievement and educational plans as students make the transition from high school. A large proportion of rural youth plan to continue their education beyond high school. Consistent with prior research, socioeconomic status has a strong influence on educational attainment and achievement of adolescents (McLoyd, 1998). This finding is important given the higher rates of poverty in rural areas and the difficulty of meeting the needs of economically disadvantaged students in rural schools due to limited resources and geographical isolation (General Accounting Office, 2004). Also, as many studies have shown, access to college preparatory programs is

critical for increasing students' educational achievement and attainment (Eccles, 2004; Mau & Bikos, 2000; Mickelson & Heath, 1999; Oakes, 2005). Due to teacher shortages, low salaries, and geographical isolation, many rural schools have difficulty recruiting and retaining teachers to teach upper level mathematics and science or advanced placement courses (Provasnick et al., 2007). Going beyond prior research, this study also revealed important influences related to students' perceptions of the interpersonal context of their schools. Rural high schools generally enroll between 200-400 students. Even in these small school environments, a strong sense of community and social support has an important influence on self-efficacy beliefs, educational plans and achievement.

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TABLE 1

Educational expectations: tests for significance of indirect and total effects

Name	t statistic	df*
SES → Efficacy-related Beliefs → Educational Expectations	4.416	19
High School Program → Efficacy-related Beliefs → Educational Expectations	2.826	19
Relational Context of Schools → Efficacy-related Beliefs → Educational Expectations	3.772	19
Total Effect SES (direct & indirect)	14.07	19
Total Effect High School Program (direct & indirect)	10.482	19
Total Effect Relational Context of Schools (direct & indirect)	3.507	19

* Each value is significant at the $p < .05$ level for one-tailed test, $t > 1.729$

TABLE 2

Indirect and direct effects for personal and school-related influences of educational expectations

Variable Name	Indirect	Direct	Total
Geographic Residential Preference	__	.10	.10
Relational Context of Schools	.03	.11	.14
Adolescent's High School Program	.01	.23	.24
SES	.02	.29	.31
Adolescent's Efficacy-related Beliefs	__	.11	.11

TABLE 3
Mathematics achievement tests for significance of indirect and total effects

Name	t statistic	df*
SES → Efficacy-related Beliefs → Achievement	5.73	19
High School Program → Efficacy-related Beliefs → Achievement	3.5	19
Relational Context of Schools → Efficacy-related Beliefs → Achievement	6.15	19
Total Effect SES (direct & indirect)	17.13	19
Total Effect High School Program (direct & indirect)	7.31	19

* Each value is significant at the $p < .05$ level for one-tailed test, $t > 1.729$

TABLE 4
Indirect and direct effects for personal and school-related influences on achievement

Variable Name	Indirect	Direct	Total
Relational Context of Schools	.06	__	.06
Adolescent's High School Program	.03	.16	.19
SES	.06	.35	.41
Adolescent's Efficacy-related Beliefs	__	.27	.27

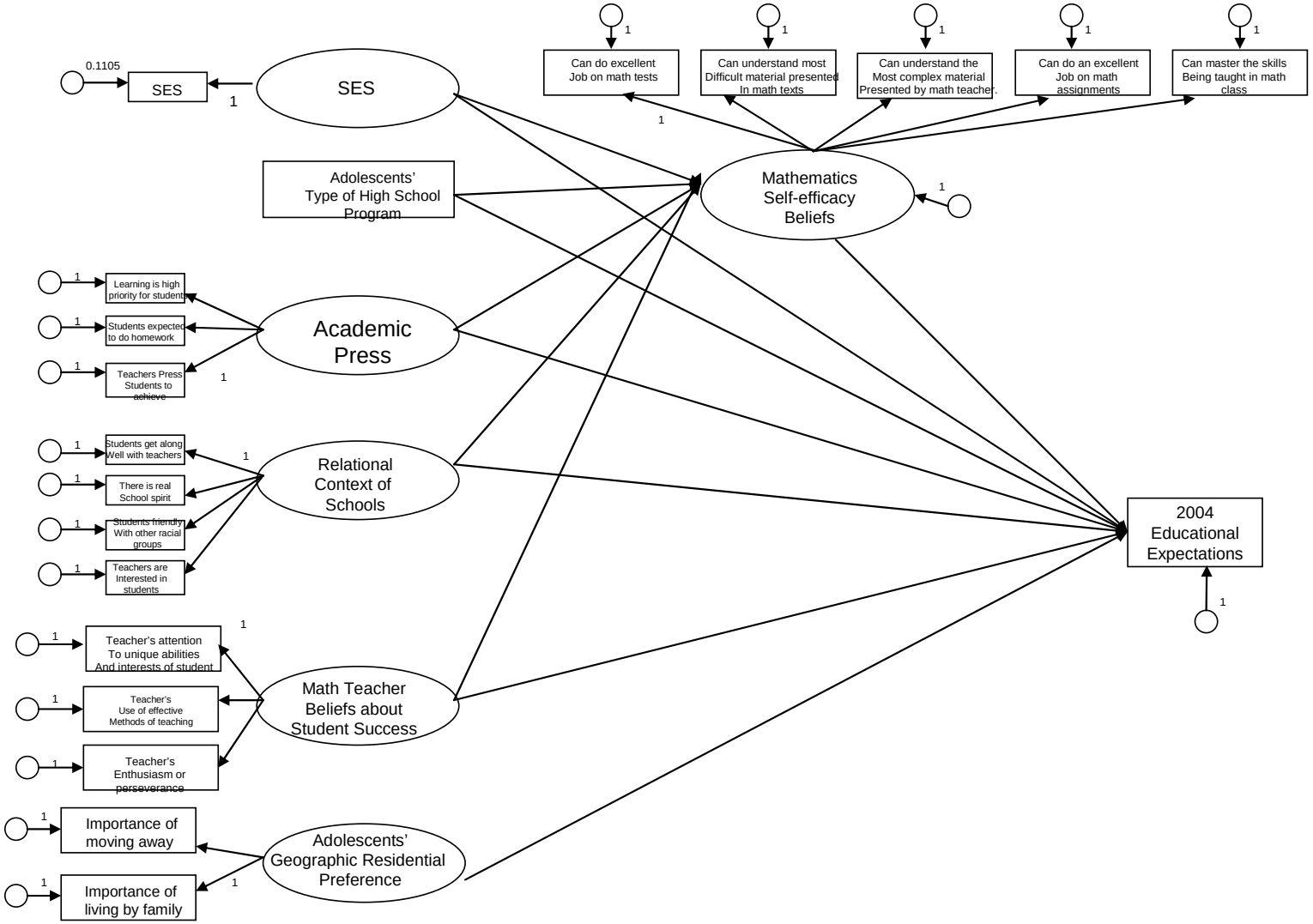

FIGURE 1: *Proposed model for educational expectations depicting both measurement and structural components. All latent factors are correlated. For purposes of visual clarity and ease of viewing, those relationships are not depicted.*

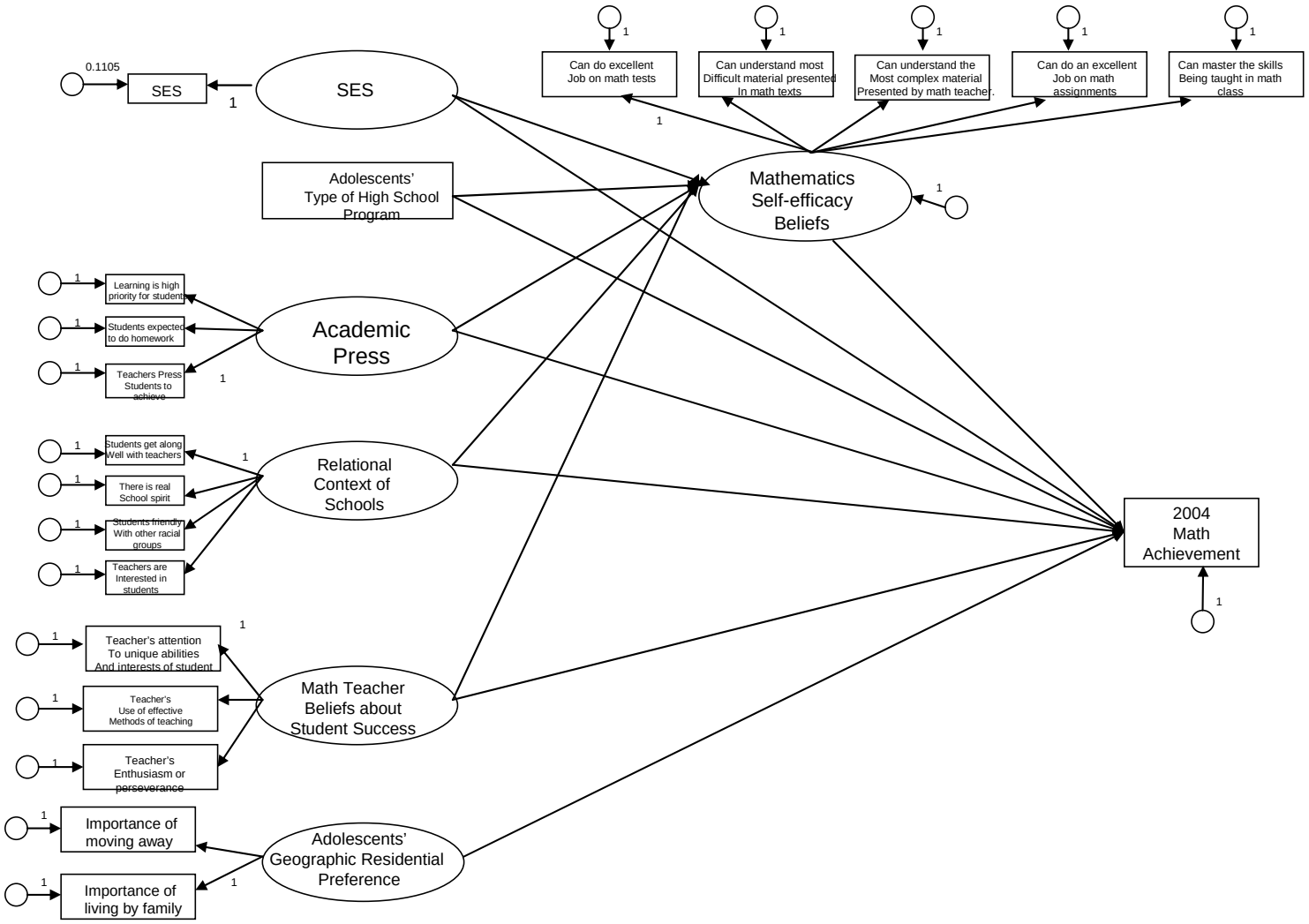

FIGURE 2: *Proposed model for mathematics achievement depicting both measurement and structural components. All latent factors are correlated. For purposes of visual clarity and ease of viewing, those relationships are not depicted.*

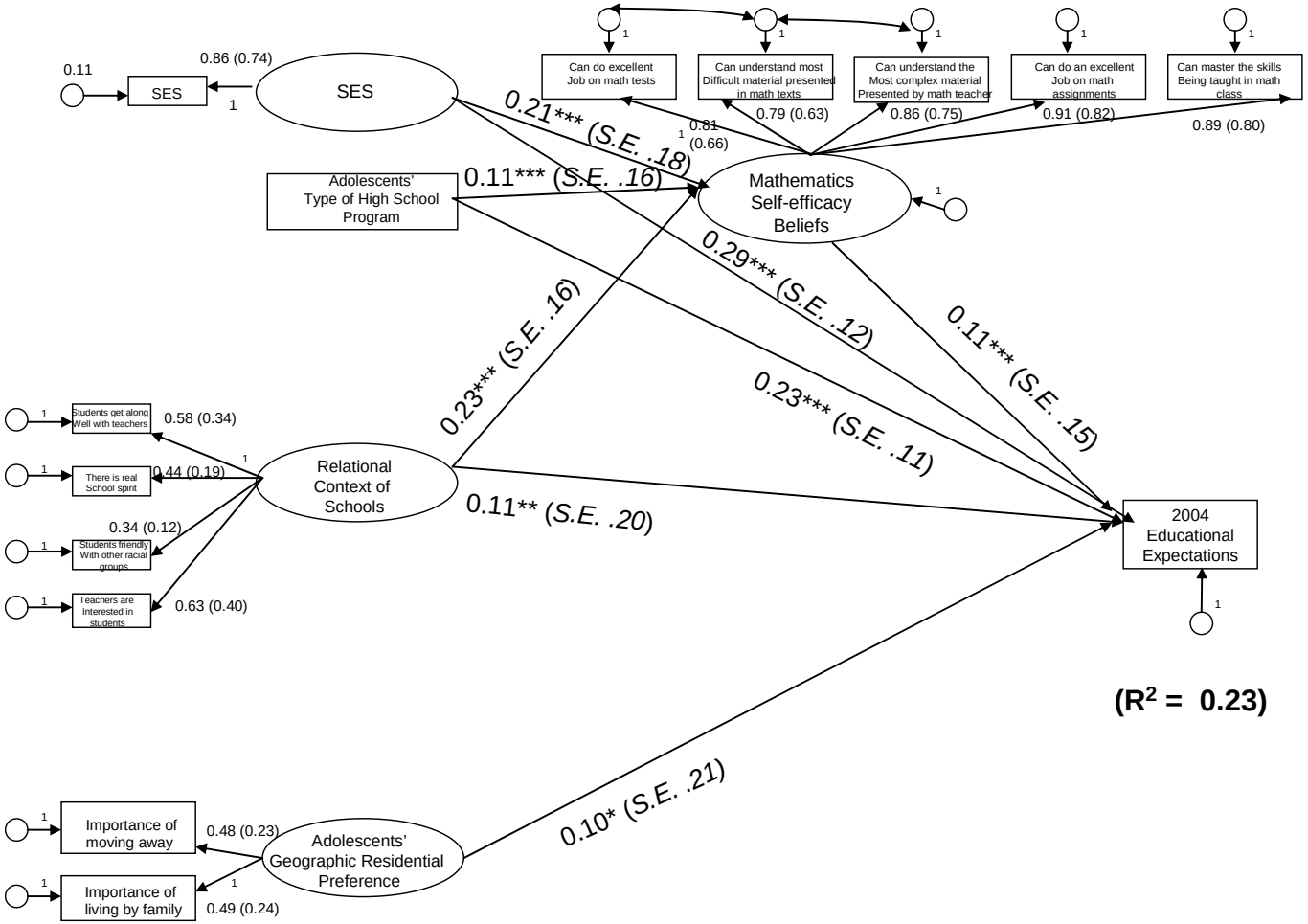

FIGURE 3: *Final revised model for educational expectations depicting both measurement and structural components. Mean χ^2 = 105.685 (df = 64), Mean CFI = 0.995, Mean TLI = .993, Mean RMSEA = 0.018, Mean SRMR = 0.017. Standard Errors (S.E.) are reported italicized in parentheses. Paths are reported as Standardized Estimates. The R^2 estimate for the total model is reported in parentheses. * p ≤ .05. ** p ≤ .01. *** p ≤ .001. All latent factors are correlated, but for purposes of visual clarity and ease of viewing, those relationships are not depicted.*

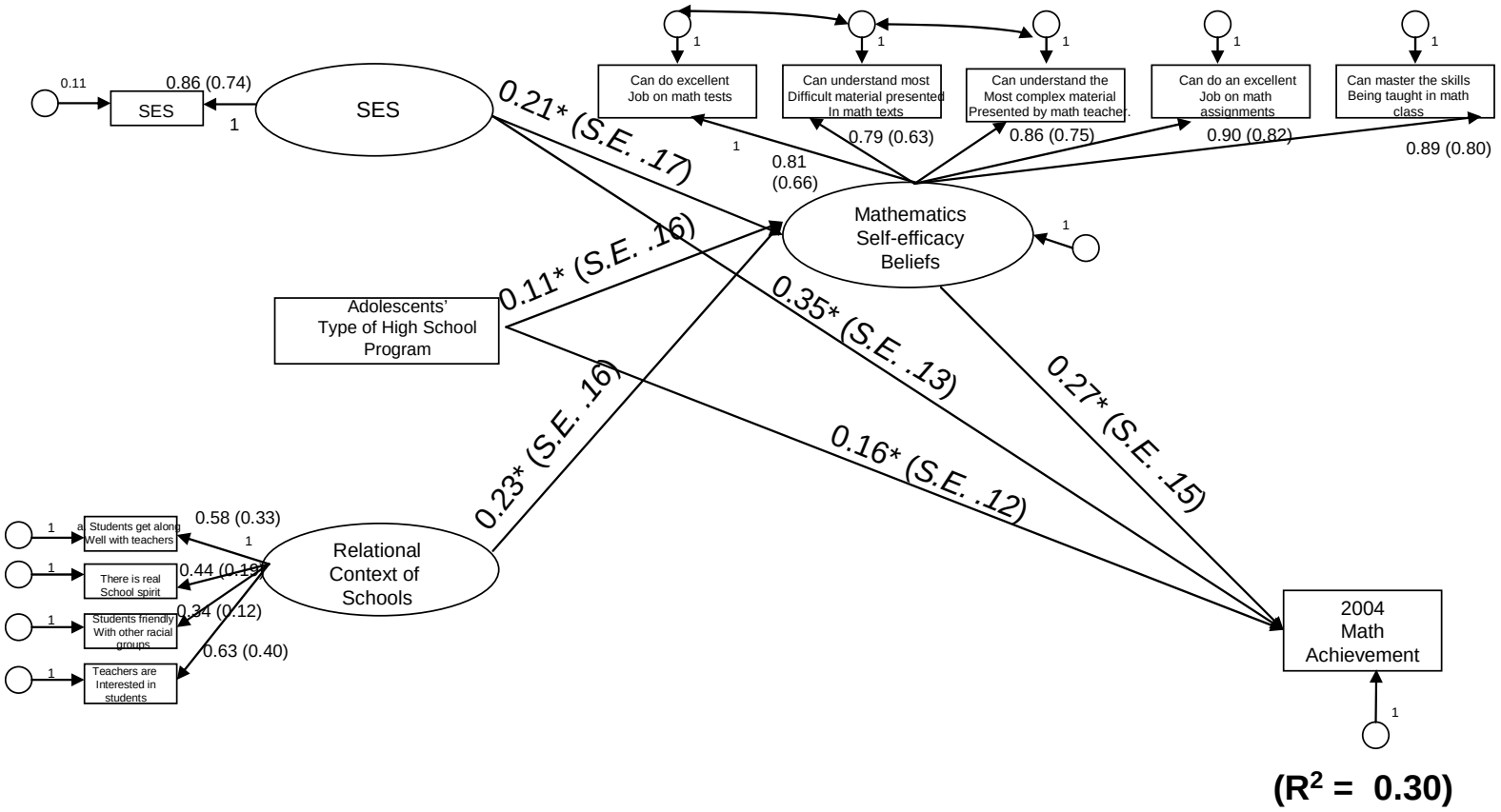

FIGURE 4: *Final revised model for achievement depicting both structural and measurement components. Mean χ^2 = 116.516 (df = 64), Mean CFI = 0.991, Mean TLI = .987, Mean RMSEA = 0.027, Mean SRMR = 0.017. Standard Errors (S.E.) are reported italicized in parentheses. Paths are reported as Standardized Estimates. The R^2 estimate for the total model is reported in parentheses. * p $\leq$ .001. All latent factors are correlated, but for purposes of visual clarity and ease of viewing those relationships are not depicted.*