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Rural-Nonrural Disparities in Postsecondary Educational Attainment Revisited

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Abstract

Using data from the National Educational Longitudinal Study, this study revisited rural-nonrural disparities in educational attainment by considering a comprehensive set of factors that constrain and support youth's college enrollment and degree completion. Results showed that rural students were more advantaged in community social resources compared to nonrural students, and these resources were associated with a significant increase in the likelihood of bachelor's degree attainment. Yet results confirmed that rural students lagged behind nonrural students in attaining a bachelor's degree largely due to their lower socioeconomic background. The findings present a more comprehensive picture of the complexity of geographic residence in shaping college enrollment and degree attainment.

Keywords

Rural-nonrural disparities; community social resources; postsecondary educational attainment

Rural-Nonrural Disparities in Postsecondary Educational Attainment Revisited Increasing college readiness, attendance, and graduation is a national priority. In 2009, President Barack Obama announced the *American Graduation Initiative* to increase the number of college graduates by five million over the next decade (Brandon, 2009). Out of 36 developed nations, the United States currently ranks 12th in the proportion (41%) of young adults (ages 25-35) who have completed a two- or four-year college degree (Lee & Rawls, 2010). College attendance and completion, meanwhile, vary significantly across gender, socioeconomic, ethnic, and racial groups in the United States (Deil-Amen & Turley, 2007; Goldrick-Rab, Carter, & Wagner, 2007). However, less attention is focused on differences in educational attainment related to rurality. Given that approximately 20% of America's youth live in rural areas, their postsecondary participation and degree completion warrants examination (Alliance for Excellent Education, 2010).

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Prior research on rural-nonrural differences in educational attainment focuses mainly on either high school completion (Roscigno & Crowley, 2001; Roscigno, Tomaskovic-Devey, & Crowley, 2006) or on college enrollment (Hu, 2003; Smith, Beaulieu, & Seraphine, 1995). The few studies that have examined college completion indicate that rural youth lag behind nonrural youth (Gibbs, 1998; Provansik et al., 2007). For example, data on 25-35-year-olds from the American Community Survey of 2004 indicated that 21% of the rural sample had received a bachelor's degree or higher, compared with 34% for each of the city and suburban samples (Provansik et al., 2007). Therefore, to better address rural-nonrural inequalities in the attainment of a postsecondary degree, it is necessary to examine college degree attainment and noncompletion as well as college enrollment.

In addition, most prior comparative research follows a rural disadvantage perspective, which highlights the lower socioeconomic status (SES), lower parental expectations, and poorer high school preparation in rural than in nonrural areas (Roscigno & Crowley, 2001; Roscigno et al., 2006). Although substantial data support this rural disadvantage perspective (Roscigno & Crowley, 2001; Roscigno et al., 2006), contradictory evidence is also apparent. With respect to academic achievement, for example, Fan and Chen (1999) found that students who attended rural schools generally performed as well as their nonrural counterparts on a variety of achievement measures. The authors concluded that, all things being equal, rural youth “do not suffer disadvantage simply as the result of their residence in rural areas or their attendance at rural schools” (Fan & Chen, 1999, p. 31).

Consistent with this view, several researchers have drawn attention to features of rural families, schools, and communities that promote positive youth development (Crockett, Shanahan, & Jackson-Newsom, 2000; Demi, Coleman-Jensen, & Synder, 2010; Elder & Conger, 2000; Hardré, Sullivan, & Crowson, 2009; Howley, 2006). Specifically, rural communities often are characterized as high in social resources or capital¹ due to their small size and strong connections among families, schools, and religious institutions (Coleman, 1988; Crockett et al., 2000; Elder & Conger, 2000). Yet few large-scale studies of educational attainment have examined these features of rural communities.

In this study, we build on and extend previous research that examined rural-nonrural disparities in educational attainment by addressing limitations of prior research. Specifically, we investigate rural-nonrural disparities in college enrollment and degree attainment using longitudinal data from the National Education Longitudinal Study (NELS) of 1988 that followed high school seniors (1992) through their postsecondary years (2000). Further, we examine a more comprehensive set of factors shaping rural-nonrural disparities in college enrollment and degree attainment. Finally, we examine how predictors of college enrollment and degree attainment vary by rurality.

Background and Prior Research

Definitions of Rurality

There are numerous definitions of rurality (Arnold, Biscoe, Farmer, Robertson, & Shapley, 2007; Rural Policy Institute, 2006; Strong, Del Gross, Burwick, Jethwani, & Ponza, 2005). In the present study, rurality (or urbanicity) is defined according to definitions used in NELS, which includes three categories of schools (rural, suburban, and urban). Rural schools are located *outside* of Metropolitan Statistical Areas (MSAs); urban schools are in the central cities of MSAs; and suburban schools are within an area surrounding a central

¹Coleman (1988) defined social capital as capital that consists of “the relations among persons”(p. S100), separable from other forms of resources such as financial capital (e.g., income) and human capital (e.g., years of schooling). Social capital can be derived from social connections among family, schools, and community organizations (Coleman, 1988; Crockett et al., 2000; Elder & Conger, 2000).

city within a county constituting the MSAs (Lippman, Burns, & McArthur, 1996). Here, a MSA refers to an urbanized area that has a population of at least 50,000 and “comprises the central county or counties containing the core, plus adjacent outlying counties having a high degree of social and economic integration with the central county as measured through commuting” (U.S. Office of Management and Budget, 2010, p. 37252). We acknowledge that considering rural students (or schools) as a homogenous group may be problematic because there is great variability in occupational structure, median income, ethnic composition, population density, geographical isolation, and school quality across rural communities in the United States (Johnson & Strange, 2009; Provasnik et al., 2007). This problem is likely true for the categories of urban and suburban students. Unfortunately, the NELS dataset itself does not provide alternative measures of rurality other than the above locale categories. Thus, generalizations from our results should be appropriately qualified.

Meanwhile, given the focus of this study on the role of rurality in explaining differences in postsecondary educational attainment, we use the term *nonrural* to refer to suburban and urban locales. This term has been used in prior comparative studies (e.g., Haller & Virkler, 1993; Lee & McIntire, 2000). Other researchers (e.g., Gibbs, 1998, 2003) have used nonmetro versus metro to capture this distinction. Where appropriate, we highlight differences between youth attending urban and suburban schools and include all three geographical locations in the analyses that follow.

Characteristics of Rural Communities

Despite variation across rural communities, rural youth tend to face serious challenges that may limit their postsecondary educational attainment. Generally speaking, poverty rates are higher for youth in rural than nonrural areas (Lichter & Johnson, 2007; O'Hare & Savage, 2006). In addition, parents in rural areas have lower postsecondary educational attainment and educational expectations for their children than parents in nonrural areas (Provasnik et al., 2007; Roscigno & Crowley, 2001; Roscigno et al., 2006). Furthermore, rural youth are more likely than nonrural youth to experience a narrow school curriculum and limited access to career counseling and college preparatory programs (Graham, 2009; Griffin, Hutchins, & Meece, 2011; Lapan, Tucker, Kim, & Koscuilek, 2003; Monk, 2007; Provasnik et al., 2007). A substantial body of evidence suggests that these precollege factors (i.e., family income, parents' education and educational expectations, and academic preparation) predict youth's college enrollment, persistence, and completion (Adelman, 2006; Adelman, Daniel, Berkovits, & Owings, 2003; Attewell, Heil, & Reisel, 2011; Bozick, 2007; Goldrick-Rab, 2006; Goldrick-Rab & Pfeffer, 2009).

Less is known about the role of these precollege factors in rural youth's college enrollment and degree attainment. Prior research from a rural disadvantage perspective also overlooks features of rural communities that may be conducive to youth's educational attainment. As noted, rural communities are often small and have strong ties among residents (Coleman, 1988; Crockett et al., 2000; Elder & Conger, 2000; Howley, 2006). A supportive community may offer additional resources (Crockett et al., 2000; Elder & Conger, 2000; Hardré, Sullivan, & Crowson, 2009; Howley, 2006), often conceptualized as *community social capital* (Israel & Beaulieu, 2004; Israel, Beaulieu, & Hatless, 2001; Sun, 1999). These community resources may potentially offset family economic hardship and school resource constraints. Indeed, several prior studies have shown that social connections between families and to religious organizations are positively related to youth's educational achievement beyond family background (Israel & Beaulieu, 2004; Israel et al., 2001; Smith et al., 1995; Sun, 1999). Therefore, a more comprehensive set of features among families, schools, and communities must be considered.

Prior Research on Rural-Nonrural Differences in Postsecondary Educational Attainment

Limited research has used longitudinal data to test rural-nonrural disparities in postsecondary educational attainment or to identify factors responsible for this gap. Although dated, Smith et al. (1995) used data from the High School and Beyond Study that followed the 1980 sophomore class into the postsecondary years. Results showed that 45% of rural students were enrolled in college as of 1984, compared to 67% of suburban students. Further, Smith and colleagues found that student demographic characteristics, family background and social capital, and community social capital explained some, but not all, of the rural-nonrural differences in college enrollment. Smith et al. (1995) also found variation in the predictors of college attendance across different types of communities. Specifically, family income and number of siblings were not predictive of college enrollment among students from rural communities, whereas both were predictive among students from urban and suburban communities (Smith et al., 1995). Furthermore, student church attendance² predicted college attendance across different types of communities, but the relation was stronger among rural students (Smith et al., 1995).

Using the National Longitudinal Survey of Youth, Gibbs (1998) also reported a significant gap in college enrollment (including two- and four-year programs) between rural and urban respondents. Consistent with Smith et al. (1995), Gibbs reported that individual and family factors, including family income and school grades, explained a small amount of the rural-nonrural variation in college attendance. Yet, Gibbs (1998) did not examine the differential impact of individual and family factors on college attendance by geographic location. Additionally, the study focused only on college enrollment.

The Current Study

Although informative, prior studies are limited. First, research has focused more on college enrollment than on college completion. Second, a limited set of precollege factors were examined. Also, the empirical models tested failed to fully account for rural-nonrural disparities in college attendance and completion. Finally, prior research suggested some factors, such as student church attendance, may have a stronger influence for rural than urban youth (Smith et al., 1995). However, few studies have examined potential variation in predictors of college enrollment and degree attainment by rurality.

Accordingly, the current research was guided by three specific aims. Using postsecondary follow-up data from NELS, the first aim was to examine differences in college enrollment and degree attainment (including an associate's degree, a bachelor's degree, and no degree attainment) for rural, suburban, and urban youth completing high school in 1992. The NELS is the most recent source of information on the educational attainment of U.S. students eight years beyond high school graduation.³ The second aim was to identify precollege factors that might explain rural-nonrural differences in college enrollment and degree attainment. In addressing this research aim, we included (a) socioeconomic background, (b) family composition and social resources, (c) community social resources, and (d) academic preparation in high school, in addition to demographic and regional controls. The third aim was to examine variation in relations by rurality.

²Smith et al. (1995) used student church attendance as an indicator of community social capital as churches “serve functions other than those originally intended, such as providing opportunities for social interaction and support” (p. 368).

³The Educational Longitudinal Study of 2002 (ELS:02) has followed a more recent cohort of high school students into the postsecondary years. Its second follow-up (2006) provides data to examine college enrollment but not degree attainment over an extended period (eight years) as the NELS data.

Method

Data

To investigate rural-nonrural disparities in postsecondary educational attainment, we used data from NELS administered by the National Center for Education Statistics (NCES). In 1988, the NCES drew random samples of approximately 25 eighth graders in each of about 1,000 randomly selected middle schools. NELS followed the students through high school in 1990 and 1992 (10th and 12th grades, respectively), and beyond in 1994 and 2000 (two and eight years after high school graduation, respectively). Due to attrition and nonresponse bias, the sample was refreshed with additional respondents in 10th and 12th grades, to maintain a representative data set at that time (Curtin, Ingels, Wu, & Heuer, 2002). The NELS panel of 1988-2000 consisted of approximately 12,100 students.

We analyzed data from the restricted-use version of NELS, which includes high school and postsecondary transcript data, to obtain more accurate information about academic preparation in high school and college degree attainment. Our analytic sample included only students who were in the 12th grade in 1992 and had valid information about their high school completion and postsecondary educational attainment. We used a longitudinal weight (F4F2HWT), which scales the 2000 sample to the 1992 population of high school seniors and accounts for the sampling scheme and non-response (Curtin et al., 2002). Due to small sample sizes, we excluded American Indian/Alaska Native and multiracial students. This yielded an unweighted *N* of 9,540 students.⁴ In the analytic sample, approximately 32% attended rural high schools (see Table 1).

Variables

Dependent variables—We selected two outcome measures from the transcript data: college enrollment and degree attainment. College enrollment was measured by whether the respondent had enrolled in a postsecondary institution by 2000. College degree attainment was measured by the highest degree attained by 2000: (a) no college enrollment, (b) certificate/associate's degree, (c) bachelor's degree, and (d) no college degree attainment (or noncompletion). No college degree attainment refers to students who enrolled in college at any time after high school graduation but had not earned a college degree.⁵ In our analytic sample, 20% were not enrolled in college, 10% earned a certificate/associate's degree, 38% earned a bachelor's degree or above, and 32% were enrolled in college but had not earned a degree by 2000 (see Table 1). There was variation in college enrollment and degree completion; the proportion of students who had not enrolled in college was highest among rural (26%) students, followed by suburban (18%) and urban (16%) students. Additionally, the proportion of students earning a bachelor's degree (or higher) was lowest among rural (30%) students, followed by suburban (40%) and urban (43%) students.

Independent variables—Drawing on prior literature on rural education (Smith et al., 1995; Sun, Hobbs, Elder, & Sun, 1997) and postsecondary educational attainment (Deil-Amen & Turley, 2007; Goldrick-Rab et al., 2007), we included a comprehensive set of independent variables that might explain rural-nonrural differences in college enrollment and degree attainment. A detailed description of these independent variables is in Appendix A. To briefly describe, for *socioeconomic background*, we included two measures: parental

⁴Sample sizes throughout the article are rounded to the nearest 10 in compliance with NCES regulations for using restricted data.

⁵We acknowledge that students whose college degree attainment was incomplete within the data collection timeframe (i.e., eight years after high school graduation) may eventually earn a college degree, although it may take them a number of years to do so. Given that these students are then likely to be counted as college completers, our estimates of the level of postsecondary educational attainment may be subject to change, depending on the time span of any longitudinal study carried out in the future. A future longitudinal study with a longer time span is needed to better understand the complex patterns of college persistence and completion by rurality.

educational level and family income. For *family composition* and *social resources*, we included (a) family structure, (b) number of siblings, (c) parental expectations for child's education, (d) the frequency parents reported discussing academic issues with child. For *community social resources*, we included (a) the frequency parents reported communicating with parents of child's friends, (b) the degree parents reported knowing parents of child's friends, and (c) the frequency students reported participating in religious services. For *academic preparation in high school*, we used (a) high school GPA, (b) scores on the standardized test administered by NELS, and (c) curriculum intensity.⁶ All independent variables were included in the second follow-up (Grade 12, 1992) data collection.

Controls—Prior literature suggests that demographic and regional background is a source of differences in college enrollment and degree attainment (Deil-Amen & Turley, 2007; Goldrick-Rab et al., 2007; Turley, 2009). Thus, although our focus is not on the role of demographic and regional background, we included (a) gender, (b) race/ethnicity, and (c) region as controls. These variables also were included the second follow-up when students were in 12th grade.

Analytic Strategies

We used four major analytic strategies to investigate the potential role of family background, community social resources, and academic preparation in explaining rural-norural differences in postsecondary educational attainment. First, to examine unadjusted rural-norural differences in family background, community social resources, and academic preparation, we conducted univariate linear, logistic, and multinomial regression for each of the independent variables, depending on their scales, with a set of dummy variables for rurality (i.e., rural [reference group], suburban, and urban).⁷ Second, given the dichotomous measure of college enrollment, we conducted logistic regression to investigate sources of rural-norural differences in the likelihood of being enrolled in college (vs. no college enrollment) eight years after high school graduation (as of 2000) with the total sample. Given the four categories of college degree attainment (i.e., no college enrollment, associate's degree, bachelor's degree, and no college degree attainment), we next performed multinomial logistic regression to examine sources of rural-norural differences in the likelihood of earning different types of college degrees with the pooled sample. For the logistic and multinomial logistic regression, we estimated five models. The first model added a set of dummy variables for rurality with the control variables (Model 1). Subsequently, we entered the socioeconomic variables (Model 2), family composition, and social resource variables (Model 3), community social resource variables (Model 4), and academic preparation variables (Model 5). The aim was to determine the extent that each set of independent variables explained variation in entering and completing college. We examined loglikelihood statistics⁸ and pseudo (McFadden's) R-squared⁹ to assess overall fit (Agresti, 2002; Long & Freese, 2006). Finally, we conducted logistic and multinomial logistic regression for the rural, suburban, and urban samples, separately. The aim was to

⁶The curriculum intensity variable (ACCURHSQ) was included in the NELS data, and it was based on a weighted quintile distribution of NELS students across 31 levels of academic curriculum intensity and quality (Adelman, 2006). At the highest quintile, for example, students accumulated 3.75 or more Carnegie units of both English and mathematics; highest mathematics of either calculus, precalculus, or trigonometry; 2.5 or more Carnegie units of science or more than 2.0 Carnegie units of core laboratory science; more than 2.0 Carnegie units of both foreign languages and history and/or social studies; more than one Advanced Placement course; and no remedial courses for English and mathematics (Adelman, 2006, p. 27).

⁷Chi square or *t* tests are usually used to examine the bivariate relationship among variables. Yet as we used multiple imputations, it is technically difficult to combine *t* or chi square test results across the five imputed, complete data sets. To address this issue, we used the *mim* option in Stata, which generates the combined coefficients and standard errors from bivariate linear, logistic, multinomial regression across imputed data (Royston, 2004).

⁸With each of the five completed data sets, we performed likelihood-ratio tests for all nested model specifications shown in Table 2 and Table 3. We found that each set of predictors (or model) significantly improved the equation's fit to the data for $\alpha = .05$.

⁹Pseudo R-squared approximates the amount of variance accounted by the model (Agresti, 2002; Long & Freese, 2006).

examine variation in the relations between the independent variables and postsecondary educational attainment by rurality.

Missing data—We employed the *ice* option in Stata (Royston, 2004) to impute missing data for the independent variables. The percentage of missing data imputed for each independent variable is reported in Appendix A. There was no missing data for our dependent variables because we restricted the analytic sample to students who had valid postsecondary transcript information. We generated five imputed datasets, and then averaged the coefficients and standard errors using the *mim* option in Stata (Royston, 2004).

Correction for design effects—To address the nested nature of the NELS data (i.e., students were randomly selected within the sampled schools), we used the *cluster* option in Stata, which adjusts for the inflated standard errors resulting from the violation of the independent errors (Rogers, 1993).

Results

Descriptive Results

Our first analyses examined rural-nonrural differences in family background, community social resources, and academic preparation in high school (Table 1). Results showed disparities in socioeconomic background between rural and nonrural students. With respect to parental education, for example, the percent of parents having a bachelor's degree was 20% among rural students, while the corresponding rates were 34% and 36% among suburban and urban students, respectively. In addition, the proportion of parents expecting their child to have a bachelor's degree or higher was significantly lower among rural (70%) than suburban (80%) and urban (84%) samples. Furthermore, rural students (63%) were less likely than suburban students (68%) to come from two-parent families. Also, parents of rural students ($M = 2.50$) less frequently discussed academic work with their children than did parents of suburban students ($M = 2.55$).

A different picture was apparent for community social resources. Parents of rural students were more likely than parents of suburban and urban students to communicate with ($M = 1.88$ vs. $M = 1.71$ vs. $M = 1.70$) and know ($M = 2.40$ vs. $M = 2.20$ vs. $M = 2.16$) the parents of their child's friends. In addition, rural students ($M = 3.43$) more frequently participated in religious services than suburban students ($M = 3.09$). In terms of academic preparation in high school, rural students ($M = 49.56$) had lower standardized test scores than their suburban counterparts ($M = 55.02$). In addition, rural ($M = 2.77$) students were significantly less likely than suburban ($M = 3.09$) and urban ($M = 3.27$) students to take rigorous courses. In sum, there were significant rural-nonrural differences in background characteristics and academic preparation that largely favored suburban and urban students, but community social resources were generally higher among rural students.¹⁰

Rural-Nonrural Differences in College Enrollment: Logistic Regression

The second set of analyses investigated rural-nonrural differences in college enrollment. Table 2 presents the odds ratios from the logistic regression predicting the likelihood of entering college. An odds ratio greater than 1.0 indicates that the variable is associated with an increased likelihood of college enrollment, while a value less than 1.0 indicates a decreased likelihood. While accounting for the control variables (not shown), Model 1 demonstrated a significant difference in college enrollment between rural and urban students

¹⁰Supplementary analysis confirmed that the rural advantage in community social resources held even after controlling for demographic and regional background, family background, and academic preparation in high school (Appendix B).

($OR = 1.74, p < .01$). Urban students were approximately 74% ($= [1.74 - 1.00 \times 100\%]$) more likely than rural students to be enrolled in college. No significant differences between rural and suburban students were evident.

The inclusion of socioeconomic background in Model 2 explained an additional 15% of variance in college enrollment. After socioeconomic background was added, the significant rural-urban difference in college enrollment was no longer evident. The inclusion of the family composition and social resource variables in Model 3 explained an additional 11% of the variance in college enrollment. Both family composition and social resources predicted college enrollment. In Model 4, the community social resource variables were added. These variables explained a modest amount of additional variance (0.4%) with only student church attendance significantly predicting the likelihood of college enrollment ($OR = 1.15, p < .01$). The introduction of the academic preparation variables in Model 5 increased by approximately 10% the amount of explained variance in the likelihood of entering college. The academic preparation variables were significantly related to the likelihood of college enrollment. Across Models 3, 4 and 5, the variables that were previously entered typically remained significant, but their predictive value decreased. The one exception to this pattern was student church attendance, which was no longer a significant predictor of college enrollment when the academic preparation variables were added. In sum, the observed rural-nonrural difference in college enrollment was largely attributable to rural-nonrural differences in socioeconomic and demographic background.

Rural-Nonrural Differences in College Degree Attainment: Multinomial Logistic Regression

The third set of analyses assessed rural-nonrural differences in college degree completion. Table 3 presents the odds ratios from multinomial logistic regression analyses predicting the likelihood of completing college. While accounting for controls (not shown), Model 1 showed significant rural-nonrural differences only in bachelor's degree attainment. Suburban ($OR = 1.61, p < .01$) and urban ($OR = 2.06, p < .05$) students were approximately 61% and 106%, respectively, more likely than rural students to earn a bachelor's degree. Model 2 introduced socioeconomic background and explained an additional 10% of variance in obtaining a college degree. Like college enrollment, after socioeconomic background was added, the significant rural-nonrural difference in bachelor's degree attainment was no longer apparent.

Model 3 added the family composition and social resource variables. These factors explained approximately 8% of additional variance. All of the family composition and social resource variables significantly predicted the likelihood of college degree attainment, particularly for bachelor's degree attainment. Model 4 introduced community social resource, and these variables explained a modest amount of additional variance (0.5%). The following community social resource variables significantly predicted bachelor's degree completion: parents' reports of communication with the parents of their child's friends, and student's reports of church attendance. Adding the academic preparation variables in Model 5 explained an additional 10% of variation in college degree attainment. All of the academic preparation variables significantly predicted college degree attainment. Across Models 3, 4, and 5, the variables previously entered again remained significant, but their predictive value decreased. In contrast to college enrollment, the community social resource variables that were predictive in Model 4 continued to modestly predict bachelor's degree attainment ($p < .10$), even after the academic preparation variables were added. In sum, like college enrollment, the observed significant rural-nonrural difference in college degree attainment disappeared when socioeconomic background was controlled.

Variation in the Role of Precollege Characteristics in Postsecondary Educational Attainment by Rurality

The final set of analyses assessed variation in the role of precollege factors in predicting college enrollment and degree attainment. Results in Table 4 showed variation in the role of precollege factors in college enrollment by rurality. Specifically, family income was found to predict college enrollment only for urban students. By contrast, family structure predicted college enrollment only for rural students, whereas the number of siblings predicted only for suburban students. In addition, student church attendance was significantly related to college enrollment only for rural students. Curriculum intensity positively predicted college enrollment for all students, but its relation was stronger among suburban than rural students ($t = 1.95, p < .10$).

Results in Table 5 also indicated variation in the role of precollege factors in college degree attainment by rurality. Specifically, family income predicted bachelor's degree attainment for rural and urban students but did not predict for suburban students. A two-parent family structure positively predicted associate's degree attainment among rural students but not among suburban and urban students. The degree that parents reported knowing the parents of their child's friends was positively related to bachelor's degree attainment only among rural students, and this relation was stronger among rural than suburban students ($t = 2.00, p < .05$). In addition, the student self-reported church attendance predicted bachelor's degree attainment only for rural students. Yet curriculum intensity had a positive relation with associate's degree attainment for suburban and urban students but not for rural students. In sum, the extent to which precollege factors predicted college enrollment and degree attainment varied by rurality.

Discussion

The current study contributes to previous research on rural-nonrural disparities in educational attainment in several important ways. First, research that has used large-scale, longitudinal data to examine the existence of the rural-nonrural gap in postsecondary educational attainment is limited. Most prior research has focused mainly on college enrollment (Hu, 2003; Smith et al., 1995), without examining the disparities in the college completion of students from different geographic locations. As a result, less is known about rural-nonrural disparities in college degree completion beyond college enrollment. Using longitudinal data from NELS, we addressed these limitations by investigating rural-nonrural differences in college enrollment as well as degree completion. Additionally, most prior research on rural-nonrural disparities in educational attainment has relied on the rural disadvantage perspective, arguing that rural parents and schools invest fewer resources in their children's education (Roscigno & Crowley, 2001; Roscigno et al., 2006). This approach, however, has ignored other features of rural families, schools, and communities that may collectively facilitate educational attainment. In this study, we addressed this lack of attention by considering the added value of community social resources.

On one hand, the results showed that rural students had a higher level of community social resources compared to nonrural students (Table 2 and Appendix B). In turn, rural students benefited from these community social resources, as indicated by a small but significant increase in the likelihood of college degree attainment, especially bachelor's degree completion, even after controlling for individual family background, demographic background, and academic preparation (Table 5). While offering evidence against the rural disadvantage argument, the rural advantage in community social resources may reflect the strong kinship bonds and the close social ties among families and religious institutions in rural communities (Coleman, 1988; Crockett et al., 2000; Elder & Conger, 2000). The

finding of the higher level of community social resources in rural than in nonrural settings is consistent with prior studies (Israel et al., 2001; Smith et al., 1995; Sun et al., 1997).

On the other hand, the results confirmed that rural students lagged behind suburban and urban counterparts in college enrollment and degree attainment largely because of their lower socioeconomic background (Model 2 in Table 2 and Table 3). When compared to urban and rural samples, rural youth may face more serious socioeconomic challenges in attending college and earning a degree. Furthermore, the results showed that rural parents, when compared with nonrural parents, had lower levels of educational expectations for, and involvement in, their children's education. Parental educational expectations and academic discussions were positive predictors of college enrollment and degree attainment, even after academic preparation was included in the models (Tables 4 and 5). While supporting the rural disadvantage perspective, this finding related to the significant role of family social resources highlights additional challenges facing rural youth with respect to postsecondary educational attainment. In that regard, the importance of the modest but significant positive relation of role community social resources to postsecondary educational attainment should not be underestimated. School and community resources may play an especially important role in future educational and occupational attainment when youth experience economic hardship and social isolation (Irvin, Meece, Byun, Farmer, & Hutchins, in press; Flora & Flora, 2003). In sum, our findings provide a more comprehensive picture of the complexity of the role of rurality in shaping postsecondary educational attainment.

Limitations of the Study and Directions for Future Research

The present study has several limitations that need to be addressed in future research. First, our study investigated a limited number of variables to help explain rural-nonrural differences in postsecondary educational attainment. A review of literature suggests that other school and community characteristics may shape rural-nonrural differences in postsecondary educational attainment. For example, prior research found that local job availability was significantly related to college attendance beyond the individual and family factors (Gibbs, 1998). Prior research also has suggested that college proximity is positively linked to college enrollment of youth (Turley, 2009). Therefore, future studies investigating the role of the socioeconomic and geographic context can further our understanding of the rural-nonrural disparities in postsecondary educational attainment.

Second, this study focused primarily on college enrollment and degree completion. Accordingly, we did not fully examine the specific pathways by which students achieve their postsecondary education goals and how these pathways might differ by rurality. While documenting the increasing complexity of college enrollment patterns, recent research suggests that pathways differ by students' socioeconomic and demographic background (Goldrick-Rab, 2006; Goldrick-Rab & Pfeffer, 2009). Rural students may differ from nonrural students in terms of pathways they take for postsecondary education, but little is known about rural-nonrural differences in pathways to college degree attainment. Future studies investigating possible rural-nonrural differences in students' college pathways and experiences may increase our understanding of the complex college degree attainment by rurality.

Third, this study examined postsecondary educational attainment of U.S. high school seniors in 1994 from the NELS data. Over the past decade, the rate of rural high school graduates enrolling in college has dramatically increased. For example, in 2003, approximately 35% of rural high school graduates attended a four-year college, while approximately 42% did so in 2007, showing a nearly 7% increase (Snyder & Dillow, 2010). During the same period (between 2003 and 2007), four-year college attendance rates of high school graduates increased by approximately 4% in urban areas and by approximately 1% in suburban areas

(Snyder & Dillow, 2010). Therefore, by using data that follow a more recent cohort of high school students (e.g., Educational Longitudinal Study), future studies should shed light on recent trends in rural-nonrural disparities in postsecondary educational attainment.

Last, as noted earlier, our measure of rurality was based on the NCES's trichotomy – rural, suburban, urban – but this measure may not fully capture variability among families, schools, and communities within each geographic location. This data limitation has always been the case for research relying on the national database created by the NCES (Coladarci, 2007). Several rural researchers (e.g., Brown & Schafft, 2011; Howley, 1997; Theobald, 2005; Truscott & Truscott, 2005) have called for alternative views on the definition of rurality. The traditional classification schemes of schools based on their geographic position (especially rural vs. urban dichotomy) only minimally address the critical educational challenges of postsecondary educational attainment for rural and urban youth. Future efforts are needed to develop alternative measures of rurality and to collect representative data that can better address diversity in rural and nonrural settings.

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Appendix A

Description of Variable

Variables	Description	% imputed
Dependent Variables		
College enrollment ^a	Dichotomous indicator of the college enrollment status as of 2000: no college enrollment and college enrollment.	—
College degree attainment ^a	Categorical measure of the highest degree attained as of 2000: no college enrollment, certificate/associate's degree, BA or above, and no college degree attainment.	—
Independent Variables		
<i>Rurality</i>	Trichotomous indicator of rurality: Rural (reference), suburban, and urban.	0.0
<i>Socioeconomic background</i>		
Parental educational attainment ^b	Trichotomous indicator of parental educational attainment when in 12th grade: High school graduation or less (reference), some college, BA or higher.	7.2
Family income ^b	Trichotomous indicator of family income in 12th grade: \$24,999 or less (reference), \$25,000 - \$49,999, and \$50,000 or more.	14.0
<i>Family composition and social resource</i>		
Two-parent family ^b	Dichotomous indicator of family composition when in 12th grade: Two-parent (i.e., biological mother and father) family versus other family arrangement (e.g., single-parent family) (reference).	11.6
Number of siblings ^b	Continuous measure of the number of siblings when in 12th grade.	11.7

Variables	Description	% imputed
Parental educational expectations ^b	Trichotomous indicator of parents' expectation of the surveyed child's education when in 12th grade: High school graduation or less (reference), certificate/associate's degree, and BA or higher.	10.8
Parents discuss with child about academic issues ^b	Composite score averaging six parent responses about the extent to which they discussed with their children academic work when in 12th grade (alpha = .820) ; Values ranging from 1 (never) to 3 (often).	12.4
<i>Community social resources</i>		
Parents communicate with parents of child's friends ^b	Composite score averaging three parent responses about the extent to which they discussed with parents their teen's friends their academic/career plans when in 12th grade (alpha = .858); Values ranging from 1 (seldom or never) to 4 (almost daily).	20.3
Parents know parents of child's friends ^c	Continuous measure of the extent of parents knowing the parents of child's closest friends reported by student; values ranging from 1 (not all) to 3 (many of the parents).	17.5
Student attends church ^c	Continuous measure of how often student attended religious services; values ranging from 1 (not at all) to 6 (more than once a week).	19.9
<i>Academic preparation in high school</i>		
GPA ^a	Continuous measure of high school grade point average (GPA), value ranging from 0 to 4.	22.5
Standardized test scores	Continuous measure of the NELS senior test score percentile; range from 1 percent (low achieving) to 100 percent (high achieving).	10.8
Curriculum intensity	Continuous measure of the rigor of student's high school curriculum determined for multiple subjects (e.g., math, AP courses, English, foreign language, etc.) by assessing both the quality of courses taken and number of hard courses (see Adelman, 2006, for more information on the construction of this variable); values ranging from 1 (lowest quintile) to 5 (highest quintile).	7.6
Controls		
Female	Dichotomous indicator of the student's gender; reference: male	0.0
Race/ethnicity	Categorical measure of the student's race; Asian, Hispanic, Black, and White (reference).	0.0
Region	Categorical measure of the region of the high school; Northeast, Midwest, South (reference), and West.	0.0

^a transcript information.

^b parent questionnaire.

^c student questionnaire.

Appendix B

Rural-Nonrural Differences in Community Social Resources (N = 9,540)

Variable	Dependent variables					
	Parents communicate with parents of child's friends		Parents know parents of child's friends		Student attends church	
	Coef.	(Robust Std. Err.)	Coef.	(Robust Std. Err.)	Coef.	(Robust Std. Err.)
<i>Rurality</i>						
Suburban	-0.17	*** (0.03)	-0.22	*** (0.04)	-0.28	** (0.085)
Urban	-0.19	*** (0.04)	-0.25	*** (0.05)	-0.17	(0.116)
R^2 ^a	0.133		0.08		0.11	

Note: Results are from OLS regression analyses. Model includes controls for parental education, family income, family composition, parental educational expectations, parents' discussion with child, GPA, standardized test score, curriculum intensity, gender, race/ethnicity, and region (see Appendix A).

^a R^2 based on one complete and weighted data set.

*** p<.001

** p<.01 (two-tailed tests)

References

- Adelman, C. The toolbox revisited: Paths to degree completion from high school through college. Washington, DC: U.S. Department of Education; 2006. Retrieved from <http://www2.ed.gov/rschstat/research/pubs/toolboxrevisit/toolbox.pdf>
- Adelman, C.; Daniel, B.; Berkovits, I.; Owings, J. Postsecondary attainment, attendance, curriculum, and performance: Selected results from the NELS:88/2000 postsecondary education transcript study (PETS), 2000 (NCES 2003-394). Washington, DC: U.S. Department of Education, National Center for Education Statistics; 2003.
- Agresti, A. Categorical data analysis. 2nd. New York, NY: John Wiley & Sons; 2002.
- Alliance for Excellent Education. Current challenges and opportunities in preparing rural high school students for success in college and careers. Washington, DC: Author; 2010.
- Arnold, MM.; Biscoe, B.; Farmer, TW.; Robertson, DL.; Shapley, KL. How the government defines rural has implications for education policies and practices (Issues & Answers Report, REL 2007-No 010). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Southwest; 2007. Retrieved from <http://ies.ed.gov/ncee/edlabs>
- Attewell P, Heil S, Reisel L. Competing explanations of undergraduate noncompletion. American Educational Research Journal. 2011; 48:536–559.10.3102/0002831210392018
- Bozick R. Making it through the first year of college: The role of students' economic resources, employment, and living arrangements. Sociology of Education. 2007; 80:361–385.10.1177/003804070708000304
- Brandon, K. Investing in education: The American graduation initiative. 2009 Jul 14. [Blog post] Retrieved from <http://www.whitehouse.gov/blog/2009/07/14/investing-education-american-graduation-initiative>
- Brown, DL.; Shafft, KA. Rural people and communities in the 21st century. Malden, MA: Polity Press; 2011.
- Coladarci T. Improving the yield of rural education research: An editor's swan song. Journal of Research in Rural Education. 2007; 22(3) Retrieved from <http://jrre.psu.edu/articles/22-3.pdf>.
- Coleman JS. Social capital in the creation of human capital. American Journal of Sociology. 1988; 94(Suppl.):S95–S120.10.1086/228943

- Crockett, L.J.; Shanahan, M.J.; Jackson-Newsom, J. Rural youth: Ecological and life course perspectives. In: Montemayor, R.; Adams, G.; Gullotta, T., editors. *Adolescent diversity in ethnic, economic, and cultural contexts: Advances in adolescent development*. Thousand Oaks, CA: Sage Publications; 2000. p. 43-74.
- Curtin, TR.; Ingels, SJ.; Wu, S.; Heuer, R. National education longitudinal study of 1988: Base-year to fourth follow-up data file manual (NCES 2002-323). Washington, DC: U.S. Department of Education, National Center for Education Statistics; 2002.
- Deil-Amen R, Turley RL. A review of the transition to college literature in sociology. *Teachers College Record*. 2007; 109:2324–2366.
- Demi M, Coleman-Jensen A, Synder A. The rural context and secondary school enrollment: An ecological systems approach. *Journal of Research in Rural Education*. 2010; 25(7) Retrieved from <http://jrre.psu.edu/articles/25-7.pdf>.
- Elder, GH.; Conger, RD. *Children of the land: Adversity and success in rural America*. Chicago, IL: University of Chicago Press; 2000.
- Fan X, Chen MJ. Academic achievement in rural school students: A multiyear comparison with their peers in suburban and urban schools. *Journal of Research in Rural Education*. 1999; 15(1):31–46.
- Flora, CB.; Flora, JL. *Rural communities: Legacy and change*. Boulder, CO: Westview Press; 2003.
- Gibbs, R. College completion and return migration among rural youth. In: Gibbs, RM.; Swaim, PL.; Teixeira, R., editors. *Rural education and training in the new economy: The myth of the rural skills gap*. Ames, IA: Iowa State University Press; 1998. p. 61-80.
- Gibbs, R. Rural education at a glance (Rural Development Research Report No 98). Washington, DC: U.S. Department of Agriculture, Economic Research Service; 2003. Retrieved from http://www.ers.usda.gov/publications/rdr98/rdr98_lowres.pdf
- Goldrick-Rab S. Following their every move: An investigation of social-class differences in college pathways. *Sociology of Education*. 2006; 79:61–79.10.1177/003804070607900104
- Goldrick-Rab S, Pfeffer TF. Beyond access: Explaining socioeconomic differences in college transfer. *Sociology of Education*. 2009; 82(2):101–125.10.1177/003804070908200201
- Goldrick-Rab S, Carter DF, Wagner RW. What higher education has to say about the transition to college. *Teachers College Record*. 2007; 109:2444–2481.
- Graham, SE. Durham, NH: Carsey Institute, University of New Hampshire; 2009. Students in rural schools have limited access to advanced mathematics courses. Retrieved from <http://www.carseyinstitute.unh.edu/publications/FS-Rural-married-couple-families-08.pdf>
- Griffin D, Hutchins BC, Meece JL. Where do rural high school students go to find information about their futures? *Journal of Counseling & Development*. 2011; 89:172–181.
- Haller EJ, Virkler SJ. Another look at rural-nonrural differences in students' educational aspirations. *Journal of Research in Rural Education*. 1993; 9:170–178.
- Hardré PL, Sullivan DW, Crowson MH. Student characteristics and motivation in rural high schools. *Journal of Research in Rural Education*. 2009; 24(16) Retrieved from <http://jrre.psu.edu/articles24-16.pdf>.
- Howley CB. How to make rural education research rural: An essay at practical advice. *Journal of Research in Rural Education*. 1997; 13:131–138. Retrieved from <http://www.jrre.psu.edu/articles/v13,n2,p131-138,Howley.pdf>.
- Howley CW. Remote possibilities: Rural children's educational aspirations. *Peabody Journal of Education*. 2006; 81(2):62–80.10.1207/S15327930pje8102_4
- Hu S. Educational aspirations and postsecondary access and choice: Students in urban, suburban, and rural schools compared. *Education Policy Analysis Archives*. 2003; 11(14) Retrieved from <http://epaa.asu.edu/epaa/v11n14/>.
- Irvin MJ, Meece JM, Byun S, Farmer TW, Hutchins BC. Relationship of school context to rural youth's educational achievement and aspirations. *Journal of Youth and Adolescence*.
- Israel GD, Beaulieu LJ. Investing in communities: Social capital's role in keeping youth in school. *Journal of the Community Development Society*. 2004; 34(2):35–57.10.1080/15575330409490111
- Israel GD, Beaulieu LJ, Hartless G. The influence of family and community social capital on educational achievement. *Rural Sociology*. 2001; 66(1):43–68.10.1111/j.1549-0831.2001.tb00054.x

- Johnson, J.; Strange, M. *Why rural matters 2009: The realities of rural education growth*. Arlington, VA: The Rural School and Community Trust; 2009.
- Lapan RT, Tucker B, Kim S, Kosciulek JF. Preparing rural adolescents for post-high school transitions. *Journal of Counseling and Development*. 2003; 81:329–342.
- Lee, JM.; Rawls, A. The College Board. The college completion agenda: 2010 progress report. 2010. Retrieved from http://completionagenda.collegeboard.org/sites/default/files/reports_pdf/Progress_Report_2010.pdf
- Lee J, McIntire WG. Interstate variation in the mathematics achievement of rural and nonrural students. *Journal of Research in Rural Education*. 2000; 16:168–181.
- Lichter DT, Johnson KM. The changing spatial concentration of America's rural poor population. *Rural Sociology*. 2007; 72:331–358.10.1526/003601107781799290
- Lippman, L.; Burns, S.; McArthur, E. *Urban schools: The challenge of location and poverty*. Washington, DC: U.S. Department of Education, National Center for Education Statistics; 1996.
- Long, JS.; Freese, J. *Regression models for categorical dependent variables using Stata*. 2nd. College Station, TX: Stata Press; 2006.
- Monk DH. Recruiting and retaining high-quality teachers in rural areas. *The Future of Children*. 2007; 17(1):155–174.10.1353/foc.2007.0009 [PubMed: 17407927]
- O'Hare, WP.; Savage, S. *Child poverty in rural America: New data shows increases in 41 states*. Durham, NH: Carsey Institute, University of New Hampshire; 2006. Retrieved from http://www.carseyinstitute.unh.edu/publications/FS_ruralchildpoverty_06.pdf
- Provasnik, S.; KewalRamani, A.; Coleman, MM.; Gilbertson, L.; Herring, W.; Xie, Q. *Status of education in rural America (NCES 2007-040)*. Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education; 2007.
- Rogers WH. Regression standard errors in clustered samples. *Stata Technical Bulletin*. 1993; 13:19–23.
- Roscigno VJ, Crowley ML. Rurality, institutional disadvantage, and achievement/attainment. *Rural Sociology*. 2001; 66:268–293.10.1111/j.1549-0831.2001.tb00067.x
- Roscigno JV, Tomaskovic-Devey D, Crowley LM. Education and the inequalities of place. *Social Forces*. 2006; 84:2121–2145.
- Royston P. Multiple imputation of missing values. *Stata Journal*. 2004; 4:227–241.
- Rural Policy Research Institute. *Defining rural: Definitions of rural areas in the U S*. Columbia, MO: Author; 2006.
- Smith MH, Beaulieu LJ, Seraphine A. Social capital, place of residence, and college attendance. *Rural Sociology*. 1995; 60:363–380.10.1111/j.1549-0831.1995.tb00578.x
- Snyder, TD.; Dillow, SA. *Digest of education statistics 2009 (NCES 2010-013)*. Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education; 2010.
- Strong, DA.; Del Gross, P.; Burwick, A.; Jethwani, V.; Ponza, M. *Rural research needs and data needs for selected human services*. Princeton, NJ: Mathematica Policy Research; 2005.
- Sun Y. The contextual effects of community social capital on academic performance. *Social Science Research*. 1999; 28:403–426.10.1006/ssre.1999.0661
- Sun Y, Hobbs D, Elder E, Sun D. The effects of residence location on parental involvement with the school — A contrast between non-metropolitan rural and other communities. *Southern Rural Sociology*. 1997; 13:41–64.
- Theobald P. Urban and rural schools: Overcoming lingering obstacles. *Phi Delta Kappan*. 2005; 87:116–122.
- Truscott DM, Truscott SD. Differing circumstances, shared challenges: Finding common ground between urban and rural schools. *Phi Delta Kappan*. 2005; 87:123–130.
- Turley RNL. College proximity: Mapping access to opportunity. *Sociology of Education*. 2009; 82:126–146.10.1177/003804070908200202
- U.S. Office of Management and Budget. *2010 standards for delineating metropolitan and metropolitan statistical areas*. 2010. Retrieved from http://www.whitehouse.gov/sites/default/files/omb/assets/fedreg_2010/06282010_metro_standards-Complete.pdf

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Table 1
Weighted Descriptive Statistics of Variables Included in the Analyses

Variable	All (N = 9,540)			Rural (N = 3,040)			Suburban (N = 3,870)			Urban (N = 2,630)		
	Mean	(SE)		Mean	(SE)		Mean	(SE)		Mean	(SE)	
Dependent Variables												
<i>College enrollment</i>	0.80	(0.00)		0.74	(0.01)		0.82	(0.01)	***	0.84	(0.01)	*
<i>College degree attainment</i>												
No college enrollment	0.20	(0.00)		0.26	(0.01)		0.18	(0.01)	***	0.16	(0.01)	*
Associate's degree	0.10	(0.00)		0.12	(0.01)		0.10	(0.00)		0.09	(0.01)	
BA or higher	0.38	(0.00)		0.30	(0.01)		0.40	(0.01)	**	0.43	(0.01)	†
No college degree attainment	0.32	(0.00)		0.32	(0.01)		0.32	(0.01)	*	0.32	(0.01)	*
Explanatory Variables^a												
<i>Socioeconomic background</i>												
Parental educational attainment												
High school graduation or less	0.30	(0.00)		0.37	(0.01)		0.26	(0.01)	***	0.26	(0.01)	**
Some college	0.40	(0.01)		0.44	(0.01)		0.40	(0.01)		0.37	(0.01)	
BA or higher	0.30	(0.00)		0.20	(0.01)		0.34	(0.01)	***	0.36	(0.01)	***
Family income												
\$24,999 or less	0.31	(0.01)		0.38	(0.01)		0.25	(0.01)	***	0.32	(0.01)	
\$25,000- \$49,999	0.35	(0.01)		0.39	(0.01)		0.35	(0.01)		0.31	(0.01)	*
\$50,000 or more	0.34	(0.00)		0.23	(0.01)		0.40	(0.01)	***	0.37	(0.01)	†
<i>Family composition and social resources</i>												
Two-parent family	0.66	(0.01)		0.63	(0.01)		0.68	(0.01)	*	0.65	(0.01)	
Number of siblings	4.26	(0.02)		4.17	(0.03)		4.28	(0.03)		4.35	(0.03)	
Parental educational expectations												
High school graduation or less	0.04	(0.00)		0.06	(0.00)		0.04	(0.00)	**	0.03	(0.00)	**
Associate's degree	0.18	(0.00)		0.23	(0.01)		0.16	(0.01)	**	0.13	(0.01)	*
BA or higher	0.78	(0.00)		0.70	(0.01)		0.80	(0.01)	***	0.84	(0.01)	**

Variable	All (N = 9,540)		Rural (N = 3,040)		Suburban (N = 3,870)		Urban (N = 2,630)	
	Mean	(SE)	Mean	(SE)	Mean	(SE)	Mean	(SE)
Parents discuss with child	2.53	(0.01)	2.50	(0.01)	2.55	(0.01)**	2.54	(0.01)
<i>Community social resources</i>								
Parents communicate with parents of child's friends	1.76	(0.01)	1.88	(0.01)	1.71	(0.01)***	1.70	(0.02)***
Parents know parents of child's friends	2.25	(0.01)	2.40	(0.01)	2.20	(0.01)***	2.16	(0.01)***
Student attends church	3.32	(0.02)	3.43	(0.04)	3.21	(0.03)*	3.35	(0.04)
<i>Academic preparation in high school</i>								
GPA	2.70	(0.01)	2.69	(0.01)	2.69	(0.01)	2.71	(0.02)
Standardized test scores	53.51	(0.30)	49.56	(0.51)	55.02	(0.49)**	55.85	(0.61)
Curriculum intensity	3.04	(0.01)	2.77	(0.03)	3.09	(0.02)***	3.27	(0.03)***
Controls^a								
Female	0.52	(0.01)	0.53	(0.01)	0.51	(0.01)*	0.52	(0.01)
Race/ethnicity								
Asian	0.08	(0.00)	0.03	(0.00)	0.09	(0.00)***	0.11	(0.01)***
Hispanic	0.12	(0.00)	0.09	(0.01)	0.10	(0.00)	0.21	(0.01)***
Black	0.09	(0.00)	0.09	(0.01)	0.06	(0.00)	0.13	(0.01)***
White	0.71	(0.00)	0.80	(0.01)	0.75	(0.01)*	0.55	(0.01)***
Region								
Northeast	0.18	(0.00)	0.14	(0.01)	0.24	(0.01)***	0.16	(0.01)
Midwest	0.28	(0.00)	0.32	(0.01)	0.30	(0.01)	0.22	(0.01)***
South	0.33	(0.00)	0.39	(0.01)	0.25	(0.01)***	0.38	(0.01)
West	0.20	(0.00)	0.14	(0.01)	0.21	(0.01)*	0.24	(0.01)*

^aBoth explanatory and control variables came from the second follow-up (grade 12) data collection.

p<.01,

**
p<.05,

*
p<.10 (two-tailed tests) respectively.

[†]Denote significant differences from rural areas under the $p < .001$

Table 2
Rural-Nonrural Differences in College Enrollment Adjusted for Precollege Characteristics, Logistic Odds Ratio (N = 9,540)

Variable	Model 1 (+ controls)	Model 2 (+ socioeconomic background)	Model 3 (+ family composition and social resources)	Model 4 (+ community social resources)	Model 5 (+ academic preparation)
<i>Rurality</i>					
Suburban	1.51	1.11	0.96	1.00	1.10
Urban	1.74**	1.28	1.21	1.25	1.30
<i>Socioeconomic background</i>					
Parental educational attainment ^a					
Some college		2.92***	2.24***	2.17***	1.74**
BA or higher		11.12***	6.41***	6.01***	3.72***
Family income (\$24,999 or less omitted)					
\$25,000 - \$49,999		1.91***	1.50*	1.52*	1.35
\$50,000 or more		2.99***	2.00**	2.05**	1.68*
<i>Family composition and social resources</i>					
Two-parent family					
			1.70**	1.57**	1.38*
Number of siblings					
			0.87**	0.86**	0.87*
Parental educational expectations ^a					
Associate's degree			3.89***	3.79***	3.63***
BA or higher			13.80***	13.09***	6.72***
Parents discuss with child					
			2.25***	2.14***	1.71**
<i>Community social resources</i>					
Parents communicate with parents of child's friends					
				1.07	1.08
Parents know parents of child's friends					
				0.98	1.02
Student attends church					
				1.15**	1.11
<i>Academic preparation in high school</i>					
GPA					
					1.67***
Standardized test scores					
					1.01***
Curriculum intensity					
					1.69***

	Model 1 (+ controls)	Model 2 (+ socioeconomic background)	Model 3 (+ family composition and social resources)	Model 4 (+ community social resources)	Model 5 (+ academic preparation)
Log likelihood ^b	-5295.19	-4501.90	-3884.96	-3862.40	-3337.55
Pseudo (McFadden's) R^2 ^b	0.03	0.18	0.29	0.29	0.39

Note: Models include controls for gender, race/ethnicity, and region.

^aThe reference category is high school graduation or less.

^bLog likelihood and Pseudo R^2 based on one complete and weighted data set.

*** p<.001

** p<.01

* p<.05 (two-tailed tests)

Table 3
Rural-Nonrural Differences in College Degree Attainment Adjusted for Precollege Characteristics, Multinomial Logistic Odds Ratio (N = 9,540)

Variable	Model 1 (+ controls)		Model 2 (+ socioeconomic background)		Model 3 (+ family composition and social resources)		Model 4 (+ community social resources)		Model 5 (+ academic preparation)			
	Base category = no college enrollment		Base category = no college enrollment		Base category = no PSE enrollment		Base category = no college enrollment		Base category = no college enrollment			
	Associate's degree	BA or higher	Associate's degree	No college degree attainment	Associate's degree	BA or higher	Associate's degree	BA or higher	Associate's degree	No college degree attainment		
<i>Rurality</i>												
Suburban	1.19	1.61*	1.00	1.22	0.91	0.81	1.06	0.91	0.92	1.00	1.02	1.16
Urban	1.40	2.06**	1.18	1.31	1.14	1.20	1.24	1.14	1.34	1.23	1.38	1.29
<i>Socioeconomic background</i>												
Parental educational attainment ^a												
Some college			2.09**	2.69***	1.71*	3.18***	2.18***	1.67*	3.00***	1.39	2.10**	1.82***
BA or higher			4.50***	6.630***	3.19***	15.34***	4.45***	3.08***	14.05***	2.35**	7.67***	3.32***
Family income (\$24,999 or less omitted)												
\$25,000 - \$49,999			1.44	1.94***	1.08	1.60*	1.67**	1.09	1.63*	0.99	1.45	1.50*
\$50,000 or more			1.91	2.47***	1.29	2.71**	1.91**	1.33	2.81**	1.21	2.46**	1.72*
<i>Family composition and social resources</i>												
Two-parent family												
					2.07***	2.50***	1.34	1.98***	2.17***	1.80***	1.85**	1.19
Number of siblings												
					0.92	0.84**	0.86*	0.92	0.83**	0.92	0.81**	0.86*
<i>Parental educational expectations^d</i>												
Associate's degree												
					9.41***	3.49	2.93***	9.25***	3.34	8.55***	3.76	2.76***
BA or higher												
					14.70***	80.93***	8.77***	14.29***	74.59***	8.29***	26.39**	5.52***
Parents discuss with child												
					2.22**	3.25***	1.95**	2.17**	2.81***	1.77*	1.88*	1.65**
<i>Community social resources</i>												
Parents communicate with parents of child's friends												
								1.07	1.22†	1.08	1.25†	1.05

Variable	Model 1 (+ controls)		Model 2 (+ socioeconomic background)		Model 3 (+ family composition and social resources)		Model 4 (+ community social resources)		Model 5 (+ academic preparation)	
	Base category = no college enrollment	Base category = no college enrollment	Base category = no college enrollment	Base category = no college enrollment	Base category = no PSE enrollment	Base category = no college enrollment	Base category = no college enrollment	Base category = no college enrollment	Base category = no college enrollment	Base category = no college enrollment
	Associate's degree	BA or higher	Associate's degree	BA or higher	Associate's degree	BA or higher	Associate's degree	BA or higher	Associate's degree	BA or higher
	No college degree attainment	No college degree attainment	No college degree attainment	No college degree attainment	No degree attainment	No degree attainment	No college degree attainment	No college degree attainment	No college degree attainment	No college degree attainment
Parents know parents of child's friends							0.89	1.15	0.94	1.29 [‡]
Student attends church							1.10 [‡]	1.22 ^{****}	1.06	1.13 [‡]
<i>Academic preparation in high school</i>										
GPA									2.11 ^{****}	4.35 ^{****}
Standardized test scores									1.01 [*]	1.02 ^{****}
Curriculum intensity									1.61 ^{****}	2.32 ^{****}
Log likelihood ^b	-12128.84		-10877.38		-9892.29					-8572.34
Pseudo (McFadden's) <i>R</i> ^{2b}	0.03		0.13		0.21					0.32

Note: Models include controls for gender, race/ethnicity, and region.

^aThe reference category is high school graduation or less.

^bLog likelihood and Pseudo *R*² based on one complete and weighted data set.

**** p<.001

** p<.01

* p<.05

[‡] p<.10 (two-tailed tests)

Table 4
Rural-Nonrural Differences in the Predictors of College Enrollment, Logistic Odds Ratio

Variable	Rural	Suburban	Urban
<i>Socioeconomic background</i>			
Parental educational attainment			
Some college	1.72 [*]	2.11 ^{***}	1.38
BA or higher	3.65 ^{***}	3.32 ^{***}	4.92 [*]
Family income (\$24,999 or less omitted)			
\$25,000 - \$49,999	1.36	1.29	1.42
\$50,000 or more	1.34	1.47	3.20 [*]
<i>Family composition and social resources</i>			
Two-parent family	1.62 [*]	1.22	1.36
Number of siblings	0.88	0.80 ^{**}	0.97
Parental educational expectations ^a			
Associate's degree	5.84 ^{***}	3.80 [*]	1.78 [†]
BA or higher	10.84 ^{***}	6.44 ^{**}	4.04 [*]
Parents discuss with child	1.67 [*]	1.62 [†]	2.16 ^{**}
<i>Community social resources</i>			
Parents communicate with parents of child's friends	1.02	1.15	1.10
Parents know parents of child's friends	1.19	0.87	1.03
Student attends church	1.16 [*]	1.07	1.07
<i>Academic preparation in high school</i>			
GPA	1.63 ^{**}	1.77 ^{**}	1.70 [†]
Standardized test scores	1.02 ^{**}	1.01 [*]	1.01 [*]
Curriculum intensity	1.48 ^{**}	2.11 ^{***†}	1.50 [*]
Log likelihood ^b	-1152.80	-1251.55	-848.53
Pseudo (McFadden's) R^2 ^b	0.39	0.40	0.41
Unweighted N	3,040	3,870	2,630

Note: Model includes controls for gender, race/ethnicity, and region.

^aThe reference category is high school graduation or less.

^bLog likelihood and Pseudo R^2 based on one complete and weighted data set.

[†]Denotes significant differences in the magnitude of the coefficient from rural areas at .10 level.

p<.001,

**
p<.01,

*
p<.05,

[†]
p<.10 (two-tailed tests)

Table 5
Rural-Nonrural Differences in the Predictors of College Degree Attainment, Multinomial Logistic Odds Ratio

	Rural			Suburban			Urban		
	Base category = no college enrollment			Base category = no college enrollment			Base category = no college enrollment		
	Associate's degree	BA or higher	No college degree completion	Associate's degree	BA or higher	No college degree completion	Associate's degree	BA or higher	No college degree completion
<i>Socioeconomic background</i>									
Parental educational attainment ^a									
Some college	1.44	1.77 [†]	1.85 ^{**}	1.68 [†]	2.50 ^{**}	2.13 ^{****}	1.107	2.26	1.49
BA or higher	2.23 [*]	5.64 ^{****}	3.20 ^{****}	1.94 [†]	6.84 ^{****}	3.01 ^{****}	3.66 [†]	14.38 ^{****}	4.32 [*]
Family income (\$24,999 or less omitted)									
\$25,000 ~\$49,999	1.30	1.59	1.37	1.14	1.05	1.41	0.72	1.68	1.75
\$50,000 or more	0.99	2.21 [*]	1.30	1.53	1.62	1.46	1.28	5.46 [*]	3.77 ^{**}
<i>Family composition and resources</i>									
Two-parent family	2.20 ^{**}	1.85 [*]	1.36	1.47	2.12 ^{**}	1.05	1.70	1.63	1.22
Number of siblings	0.88 [†]	0.94	0.87	0.82 ⁺	0.75	0.80 ^{**}	1.10	0.78 [*]	0.93
<i>Parental educational expectations^a</i>									
Associate's degree	14.61 ^{****}	3.86	4.27 ^{****}	5.67 ^{**}	6.53	3.39 [*]	6.97 [*]	1.23	1.24 [†]
BA or higher	14.75 ^{****}	31.36 ^{****}	8.33 ^{****}	5.54 ^{**}	32.59 [*]	5.99 ^{**}	7.07 [*]	19.35 [*]	3.22 [*]
Parents discuss with child	1.42	2.48 ^{**}	1.69 [*]	2.24 [*]	1.89 [†]	1.42	1.89	1.59	2.29 ^{**}
<i>Community social resources</i>									
Parents communicate with parents of child's friends									
Parents know parents of child's friends	1.15	1.61 [*]	1.11	0.73 [†]	1.01 [†]	0.90	1.06	1.32	0.97
Student attends church	1.10	1.17 [*]	1.18 [*]	1.01	1.14	1.07	1.05	1.03	1.07
<i>Academic preparation in high school</i>									
GPA	2.08 ^{****}	3.22 ^{****}	1.27	2.43 ^{**}	5.30 ^{****}	1.41 [†]	1.90 [*]	5.06 ^{****}	1.42

	Rural			Suburban			Urban		
	Base category = no college enrollment			Base category = no college enrollment			Base category = no college enrollment		
	Associate's degree	BA or higher	No college degree completion	Associate's degree	BA or higher	No college degree completion	Associate's degree	BA or higher	No college degree completion
Standardized test scores	1.01 †	1.02 **	1.02 **	1.01	1.02 **	1.01 †	1.01	1.02 *	1.01 *
Curriculum intensity	1.25	2.33 ***	1.33 †	2.03 *** †	2.65 ***	1.95 *** †	1.57 *	2.12 ***	1.36 †
Log likelihood ^b		-2749.74			-3404.70			-2223.49	
Pseudo (McFadden's) <i>R</i> ^{2b}		0.32			0.32			0.35	
Unweighted N		3,040			3,870			2,630	

Note: Model includes controls for gender, race/ethnicity, and region.

^aThe reference category is high school graduation or less.

^bLog likelihood and Pseudo *R*² based on one complete and weighted data set.

† Denotes significant differences in the magnitude of the coefficient from rural areas at .10 level.

*** p<.001

** p<.01

* p<.05

† p<.10 (two-tailed tests)