Dual Enrollment and Postsecondary Outcomes for Rural Students: Implications for Social Reproduction

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Dual enrollment, through which students take college classes while in high school, is a promising strategy to increase postsecondary access and attainment. Dual enrollment may be particularly important for rural students, who often have limited access to advanced coursework and are less likely to attend college. However, little is known about how dual enrollment is related to postsecondary outcomes for rural students. Using nationally representative data from the High School Longitudinal Study of 2009, this study applied multinomial logistic regression to explore the relationship between dual enrollment, socioeconomic status (SES), and postsecondary outcomes for subpopulations consisting of rural/town and city/suburb (nonrural) students. After controlling for student demographic characteristics, math self-efficacy, student educational expectations, cultural capital, and prior academic achievement, I found differences in dual enrollment outcomes for rural/town and nonrural students. Regression results showed that dual enrollment was associated with increased odds of postsecondary enrollment for rural/town students, and increased odds of persistence for nonrural students. The increase in probability of postsecondary enrollment was higher for rural students with lower socioeconomic status, as compared with their more affluent peers, suggesting that dual enrollment may be an effective strategy for disrupting the reproduction of social and economic inequality.

In the context of growing income and wealth inequality, equitable access to postsecondary education is more important than ever. Higher educational attainment is strongly correlated with higher earnings, and the economic advantages of a college education have grown over time (Cunha et al., 2011; Xie et al., 2016). Educational attainment is also associated with a wide variety of positive economic, social, civic, and health outcomes, including lower unemployment rates, improved health, and higher rates of volunteering and civic engagement (Brennan et al., 2013; Hout, 2012; Ma et al., 2019). Access to higher education opportunities, however, is not equally distributed.

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While rural communities have strong social networks and community support for education (Byun et al., 2012), they generally have fewer economic and educational resources than nonrural areas (Gagnon & Mattingly, 2016; Koricich et al., 2018), limiting education and career opportunities for rural youth. Rural students are less likely to enroll in postsecondary education (Wells et al., 2019), and those who do are more likely to enroll in community college and less selective institutions (Byun et al., 2015, 2017; Koricich et al., 2018) than their nonrural peers. Given these resource constraints and unique postsecondary enrollment patterns, policymakers need rural-specific research to address the educational needs of rural students.

Dual enrollment programs allow high school students to attend college classes and receive both high school and college credit. Various terms have been used to describe this practice, including *dual credit*, *concurrent enrollment*, or *accelerated college*, and there is no consensus on terminology among dual enrollment policies and programs (An & Taylor, 2019). For simplicity, I used the term *dual enrollment* in this study to indicate any instance of a student who completed a college course and received college credit while in high school.

Dual enrollment is associated with higher rates of college enrollment and completion (An, 2013; An & Taylor, 2019; Edmunds et al., 2020; Giani et al., 2014), and therefore provides a possible mechanism to improve postsecondary outcomes for rural students. However, dual enrollment participation varies with socioeconomic status (SES) (Rivera et al., 2019; Taylor, 2015), which potentially increases inequity in access to postsecondary education. Very little research has focused specifically on the impact of dual enrollment on postsecondary outcomes for rural students or how this relationship varies with SES.

Rural students are an understudied group in college access research (McDonough et al., 2010; Thier & Beach, 2019), and understanding how dual enrollment participation is related to college attendance patterns can have important implications for rural education policy. If dual enrollment participation increases the likelihood of enrollment in or successful transfer to baccalaureate-granting institutions for rural students, it can be a critical policy lever for increasing postsecondary educational attainment, which would potentially contribute to increased economic prosperity in rural communities.

The purpose of this quantitative study was to analyze the relationship between dual enrollment and postsecondary outcomes for rural youth, considering implications for social and economic inequality. To accomplish this purpose, the study addressed the following research questions.

1. How is dual enrollment related to rural and nonrural students' postsecondary enrollment and persistence?
2. Do these relationships change when controlling for SES?
3. Do these relationships change when controlling for other student and family characteristics, including student educational expectations, demographic characteristics, school type, math self-efficacy, parental educational aspirations (a measure of cultural capital), and achievement factors?

In addressing these questions, I analyzed data from the High School Longitudinal Study of 2009 (HSLS) and conducted the analysis separately for rural and nonrural students.

Theoretical Framework

This research is based on a theoretical framework combining social cognitive career theory and social reproduction theory. Together, these theories describe how social forces and socioeconomic context influence students' educational experiences and perceived opportunities for postsecondary education.

Social Cognitive Career Theory

Social cognitive career theory (SCCT) applies Bandura's (1986) social cognitive theory to understand the formation of career interests, decisions about education and career, and performance and persistence in education/career fields (Lent et al., 1994). In SCCT, self-efficacy, outcome expectations, and goals are the basic constructs that explain the development of career and educational aspirations and individual persistence in the pursuit of these aspirations. *Self-efficacy* "refers to people's assessments of their effectiveness, competence, and causal agency" (Gecas, 1989, p. 292). Self-efficacy beliefs are important in a student's choice of activities or actions and their persistence in these activities in the face of difficulties (Lent et al., 1994). *Outcome expectations* refer to an individual's evaluation of the physical, psychological, and/or material benefits or consequences of a given course of action (Bandura, 1986). In other words, self-efficacy beliefs relate to an individual's confidence that they can accomplish something, and outcome expectations relate to whether it is worth the effort. Self-efficacy beliefs and outcome expectations combine to develop individual interests, which are then reflected in goals. Goals ultimately lead to actions, and performance outcomes through these actions provide feedback to an individual's self-efficacy beliefs and outcome expectations, thus either reinforcing or modifying previous choices and goals (Lent et al., 1994).

In the context of rural students, SCCT suggests limited exposure to college preparatory activities and advanced coursework in rural areas may impact students' educational expectations and goals and their academic self-efficacy beliefs. Furthermore, with lower overall educational attainment in rural areas (Li, 2019) rural youth have limited exposure to the social and economic benefits of college attendance, which potentially lowers students' outcome expectations for participation in higher education.

Social Reproduction Theory

Social reproduction theory (SRT) describes how institutions, including formal education, function in reinforcing and reproducing a stratified social and economic structure (Giroux, 1981). Social class and economic advantage are passed down between generations through the transmission of economic, social, and cultural capital. These forms of capital control access to social networks, education, and career opportunities (Bourdieu, 1986). *Economic capital* consists of financial and other resources that can be directly converted into money; this form of capital represents the traditional conceptualization of wealth in terms of property and other financial assets. *Social capital* consists of relationships and access to social

networks that can advance one's social and economic position. *Cultural capital*, embodied in a person's habitus, consists of "long-lasting dispositions of the mind and body" (Bourdieu, 1986, p. 17) including values; patterns of speech and language; interests; and a wide range of culturally specific habits, preferences, and ways of thinking and acting. Unlike economic capital, cultural capital cannot be immediately transferred from one person to another; it requires time, commitment, and significant economic resources to develop. Cultural capital is most often institutionalized in the form of educational certifications that are recognized as having economic value due to the validation of the cultural capital they represent. Bourdieu (1986) argued that analyses of education solely in terms of economic capital (e.g., economic return on investment models) ignore "the contribution which the educational system makes to the reproduction of the social structure by sanctioning the hereditary transmission of cultural capital" (p. 17), and he identified the transmission of cultural capital between generations as "the best hidden and socially most determinant educational investment" (p. 17).

Social Reproduction, Social Cognitive Career Theory, and Student Outcomes

Although academic achievement is a strong predictor of postsecondary enrollment (Baker & Vélez, 1996; Belley & Lochner, 2007; Kremer, 2022), this relationship may be bidirectional (Jez, 2014). Students who see benefits of and expect success in postsecondary education are likely to place a higher value on grades and other measures of academic achievement in high school. SCCT posits that both objective and subjective likelihood of success in postsecondary education are influenced by a variety of contextual factors, including SES. Research indicates that SES is related to subjective factors such as college expectations (Bozick et al., 2010) as well as objective factors such as college enrollment rates and degree completion (Baker & Vélez, 1996; Reber & Smith, 2023). In a review of research on college access and SES, Terenzini et al. (2001) stated that "students' expectations for college attendance emerge as early as the eighth grade, perhaps even earlier, and … those expectations are clearly tied to economic status" (p. 40). Students' educational expectations and aspirations influence their motivation, choices, and behavior, which in turn impact their academic achievement (Lent et al., 1994). These motivation and achievement factors are likely to affect the educational trajectory of students and the types of courses they enroll in during high school. High school experiences in turn shape the opportunities available to students as they transition into adulthood. As educational attainment is linked to access to many high-status occupations, objective and subjective constraints on educational opportunities for socioeconomically disadvantaged students then reinforce and reproduce a stratified social structure.

Definition of Rural

Discussion of rural issues in the research literature has been complicated by varying definitions of the term *rural*. There are eight federal definitions of rurality, with estimates of the rural population in the United States ranging from less than 6.9 million to more than 75.5 million, depending on which definition researchers use (Long et al., 2021). Despite the many definitions, the term rural is often left undefined in education studies. Among studies that define the term, most employ locale codes from the National Center for Education Statistics (NCES) in their definition (Thier et al., 2021). The NCES locale codes have changed over time (Geverdt, 2019), further complicating comparisons among rural education studies (Manly et al., 2020).

The NCES locale codes provided in the HSLS were defined primarily based on population and population density as reported by the U.S. Census. The system of locale codes had four main categories: rural, town, suburb, and city, with the "town" classification applied to urban clusters, or places with populations between 2,500–50,000 people (Geverdt, 2019). In this study, I have used the locale codes from NCES to determine rural and have combined the categories of "rural" and "town" in my analysis of rural student outcomes.

Every classification system for defining rural populations has drawbacks. One issue with the NCES classification is the designation of town as an urban cluster with population between 2,500–50,000. While this range is large, the documentation for the locale codes states, "Although they range in size…, most Towns have a population less than 10,000" (Geverdt, 2019, p. 8). Especially in remote areas, small towns likely have more in common with the surrounding rural communities than with other nonrural locales.

Koziol et al. (2015) described different theoretical bases for describing rural, including definitions based on population and population density, such as the NCES definition, as well as those predicated on sociocultural theories—ways in which people are connected and interact in rural and nonrural communities. While these types of interactions are difficult or impossible to ascertain in quantitative research using a large national dataset, patterns in the distribution of relevant variables give some insight into these elements of rural life.

Descriptive statistics for the HSLS data showed that many of the demographic and outcome characteristics of interest for this study were similar for rural and town students, and these values were distinct from city and suburb students. Tests of statistical significance (chi-square

and *t*-tests) verified that the distributions for parental education, student educational expectations, postsecondary enrollment, and dual enrollment participation did not differ significantly between rural and town students, and values for rural/town students were significantly different from city and suburb students.

Thus, for both theoretical and empirical reasons, I included town students in my analysis of rural student outcomes. For my analysis, I divided the HSLS sample into two subpopulations: one consisting of rural and town students and the other consisting of city and suburb students. In this division, I am not claiming that city and suburb students are similar. As the focus of this study is on rural students, the data were split into two categories: rural/town and nonrural.

Literature Review

Although approximately 20% of school-age children in the United States live in rural communities, rural-specific studies are rare in research on college access (Arnold et al., 2005; McDonough et al., 2010; Thier & Beach, 2019). The existing research does, however, identify several differences between rural and nonrural students in access to postsecondary education. Existing research also overwhelmingly demonstrates a strong positive association between dual enrollment and postsecondary outcomes, though the dual enrollment literature does not address outcomes specifically for rural students.

Rural Students and College Access

Although rural students benefit from strong social networks and advantages in social capital (Li, 2019), they have lower levels of postsecondary educational attainment (Koricich et al., 2018; Ruiz & Perna, 2017; Wells et al., 2019) and different postsecondary enrollment patterns than nonrural students. Rural students are more likely to attend 2-year and less selective postsecondary institutions (Byun et al., 2015, 2017; Koricich et al., 2018), which may impact their chances of degree completion. According to research from the National Student Clearinghouse (Shapiro et al., 2017) only 13.3% of students who started community college in 2010 with the intention of completing a bachelor's degree had done so within 6 years of initial enrollment. Completion rates varied greatly with SES; only 9% of lower-income students who started at a community college had completed their bachelor's degree within 6 years, compared to 19.6% of higher-income students (Shapiro et al., 2017). These low rates of completion may more heavily impact rural students, who are more likely to start their education at a community college.

Rural schools play an important role in shaping students' postsecondary aspirations and outcomes. In a national study of postsecondary enrollment patterns for rural youth, Byun et al. (2017) found teacher expectations and participation in college preparatory activities had a larger impact on postsecondary enrollment than students' own educational aspirations. This point is important for rural education policy as many rural schools lack options for advanced coursework and other college preparatory resources (Byun et al., 2017; Gagnon & Mattingly, 2016; Irvin et al., 2011; Roscigno et al., 2006). Dual enrollment provides an opportunity for rural schools to leverage existing resources and structures at local community colleges to provide college preparatory experiences and convey high expectations for students' educational attainment.

Dual Enrollment

While there are many possible ways to address equity in access to higher education, dual enrollment is a strategy that has been gaining attention and support among policymakers throughout the United States. Originally, dual enrollment programs were designed to provide an accelerated pathway for high-achieving students who tended to be relatively advantaged both economically and educationally (Tobolowsky & Allen, 2016). Policy has shifted over time, and the goals of dual enrollment policy now include equitable access to educational opportunities, efficiency in the delivery of education, and quality of dual enrollment offerings (Rivera et al., 2019). These policy objectives are often in conflict with each other. For example, a focus on quality may lead policymakers to impose strict GPA or test score requirements on dual enrollment participation. To the extent that these measures are correlated with race, ethnicity, or SES, these requirements can limit access for historically disadvantaged students.

Empirical research on dual enrollment has consistently shown a positive association with a wide variety of postsecondary outcomes. Benefits of dual enrollment participation include higher rates of college enrollment (Giani et al., 2014; Lee et al., 2022; Moreno et al., 2021; Taylor, 2015; Taylor & Yan, 2018), persistence (D'Amico et al., 2013; Giani et al., 2014; Lee et al., 2022), and bachelor's degree completion (An, 2013; Edmunds et al., 2020; Giani et al., 2014; Taylor, 2015).

Some of the first studies that linked dual enrollment participation with positive postsecondary outcomes on a national level used data from the National Education Longitudinal Study (NELS), which reflected outcomes for students who graduated high school in 1992 (An, 2013). Although dual enrollment goals and policies have changed substantially since the 1990s, studies that used more recent

data have found similar positive results (Edmunds et al., 2020; Henneberger et al., 2022; Lee et al., 2022). These more recent studies have indicated that as dual enrollment has become more common and less selective, its benefits for postsecondary access and degree completion are still important.

The association between dual enrollment and improved postsecondary outcomes has been demonstrated at both community colleges and 4-year universities. This finding is particularly relevant to rural education outcomes because rural students are more likely than nonrural students to attend 2-year institutions (Byun et al., 2017). Grubb et al. (2017) found dual enrollment was associated with a greater probability of completing an associate degree within 2 or 3 years of postsecondary enrollment. Although Grubb et al. did not address completion rates for bachelor's degrees, timely completion of an associate degree can be an important step in the path to a bachelor's degree (Ehrenberg & Smith, 2004).

Among studies that specifically addressed dual enrollment outcomes for marginalized groups, results were mixed. Taylor (2015) found dual enrollment effects were smaller for students of color and socioeconomically disadvantaged students, although Lee et al. (2022) found larger positive effects for historically marginalized student groups. Additionally, Henneberger et al. (2022) found positive effects for dual enrollment on college enrollment, degree attainment, and earnings 6 years after high school graduation with stronger effects on enrollment and degree completion for Black students (as compared with White students) and for students eligible for the state's free or reduced-price lunch program. In a study of early college high school (ECHS) programs, Edmunds et al. (2020) found the effect of dual enrollment participation on bachelor's degree completion was greater for economically disadvantaged students compared to more affluent students, suggesting that ECHSs may be a promising strategy for improving postsecondary outcomes for low-income students.

Most studies have found dual enrollment to be associated with improved postsecondary outcomes for all student groups, but participation in dual enrollment varies substantially with racial, ethnic, and socioeconomic student characteristics (Edmunds et al., 2022; Museus et al., 2007; Rivera et al., 2019; Taylor, 2015; Xu et al., 2021). Findings varied on the extent to which these differences could be explained by prior student achievement. For example, Rivera et al. (2019) found significant differences in dual enrollment participation by race and SES. When achievement and attitude factors were added, the correlation between SES and dual enrollment participation decreased but remained significant; racial differences were no longer significant after controlling for these factors.

Dual Enrollment and Rural Education

Dual enrollment can be particularly important in providing opportunities for advanced coursework and college preparatory programming in rural areas. Rural schools are less likely to offer AP courses (Burns & Leu, 2019; Gagnon & Mattingly, 2016) but more likely to offer dual enrollment, and rural students participate in dual enrollment at higher rates than nonrural students (Pretlow & Wathington, 2014; Rivera et al., 2019; Spencer & Maldonado, 2021). Community colleges play an important role in postsecondary education in rural communities, both in dual enrollment and as students' first postsecondary institutions. Rural students are significantly more likely to begin their postsecondary education at a 2-year institution, may transfer back and forth between 2- and 4-year institutions, and are less likely to transfer to a 4-year institution after receiving an associate degree (Byun et al., 2017; Wells et al., 2019). These nontraditional enrollment patterns may limit the applicability of existing dual enrollment research in the rural context. Despite these factors, there is virtually no empirical research on dual enrollment outcomes specific to rural students.

Methods, Data, and Analysis

In this study, I analyzed public use data from the HSLS, a large, nationally representative dataset of high school students who were in ninth grade in 2009. I applied multinomial logistic regression to determine the odds ratio for enrollment and persistence in 2-year and 4-year institutions, compared to no enrollment, separately for rural/town and nonrural students. *Persistence* in this study is measured as continuing enrollment in a postsecondary institution 3 years after high school graduation. The main explanatory variable was dual enrollment participation, with control variables for SES, prior academic achievement, race/ethnicity, sex, math self-efficacy, cultural capital (measured by parental educational aspirations), school type, and students' educational expectations. The SES index included five components: family income, education level of each parent, and occupational prestige score of both parents. The five *z*-scores (one for each component) were averaged to construct the SES index.

Sample and Instrument

The HSLS used a stratified, two-stage random sampling design and included a nationally representative sample of 1,889 eligible public and private schools across the United States. Of these eligible schools, 944 schools participated in the study (55.5% weighted average response

rate). The research team then randomly selected students in ninth-grade classes from all participating schools for the baseline survey in 2009 (Ingels et al., 2011). Follow-up surveys were conducted when students were in 11th grade (2012), immediately after high school graduation (2013), and 3 years after high school graduation (2016). Finally, the Postsecondary Transcript Study (PETS) component collected postsecondary transcripts for all HSLS participants who had enrolled in an institution in the Integrated Postsecondary Education Data System (IPEDS) as of June 30, 2017. The PETS data collection included transcripts for students who had attended such institutions at any time during or after high school (Duprey et al., 2020).

The HSLS sampled 25,206 ninth-grade students from 944 schools across the United States. Sample weights were constructed to adjust for the probability of selection into the study and for nonresponse bias. The weighting removed cases of unit nonresponse (i.e., cases where the study participant did not complete the survey) and applied corrections for nonresponse bias in the remaining weights (Duprey et al., 2018). All descriptive statistics provided were weighted using the survey weight W4W1STUP1 provided with the public use dataset. The sample and associated weights were designed so the sample was representative of ninth-grade students in the United States in 2009.

For this study, the sample was divided into two subsamples based on the locale codes from NCES. Rural (n = 5,559) and town (n = 2,788) students were combined for the rural subgroup (total n = 8,347), and city (n = 6,689) and suburb (n = 8,467) students were combined for the nonrural subgroup (total n = 15,156).

Missing data in survey results stem from both unit nonresponse (a participant does not complete the survey) and item nonresponse (a respondent fails to answer one or more questions on the survey). In large-scale survey datasets, weighting adjustments are often used to compensate for unit nonresponse (Brick & Kalton, 1996). The HSLS calculated base weights adjusted to mitigate nonresponse bias (Ingels et al., 2011). To address item nonresponse, key analytical variables (including student educational expectations and the family income and occupation variables used to compute SES) were identified for single-value imputation, and where the SES index could not be calculated through single-value imputation on the contributing variables, the SES indices were obtained through multiple imputation. Full details on the weighting and imputation procedures can be found in the HSLS data documentation (Duprey et al., 2020; Ingels et al., 2011).

Analytical Approach

To examine the relationship between postsecondary outcomes and dual enrollment, I applied multinomial logistic regression using STATA version 17. Logistic, or logit, regression estimates the probability of a given outcome in a categorical variable based on the values of the independent or explanatory variables. Because logistic regression assumes a nonlinear relationship, the change in probability for an outcome depends on both the regression coefficient and the specific value of the predictor variable(s). For this reason, results from logistic regression are generally presented as odds ratios rather than increases in probability. The odds ratio provides an estimate of the change in the odds of a particular outcome given a one unit change in the predictor variable (Long & Freese, 2014; Wright, 1995). Multinomial logistic regression extends this analysis to outcome variables with more than two possible outcomes (e.g., postsecondary enrollment considering no enrollment, enrollment in a 2-year institution, enrollment in a 4-year institution). Because odds ratios can be difficult to interpret, I also computed marginal effects for some outcomes. Marginal effects calculate the change in the probability of a given outcome at specific values of a particular explanatory variable, holding all other explanatory variables constant (Long & Mustillo, 2021).

In my first model, I used multinomial logistic regression to examine the association between dual enrollment and postsecondary enrollment and persistence in 2-year and 4-year postsecondary institutions, with separate models for rural/town and nonrural students. I then added socioeconomic status to the model to determine if this relationship changed after controlling for SES. In the final model, I added explanatory variables to control for student demographic, academic, and family characteristics. Following the multinomial regression, I computed marginal effects for dual enrollment at specific values of SES (the mean values of the SES index for each SES quintile) and ninth-grade GPA.

Complex Survey Design

Because the HSLS used a complex survey design that first selected schools and then students in those schools, I used balanced repeated replication (BRR) to calculate regression coefficients and sample variance. Multistage sampling designs, like that used in the HSLS, result in nested data, where students are nested in schools. Due to unknown school-level effects, this approach can violate the assumption of independence and result in incorrect estimates for the standard error. Replication techniques such as BRR produce more reliable estimates of standard error (Rust & Rao, 1996). BRR was the technique recommended by NCES for analysis of the HSLS dataset (Ingels et al., 2011). I used the "svy" command in STATA to apply the W4W1STUP1 sampling weights and BRR replicate weights provided in the HSLS dataset.

Findings

The sample for the HSLS was chosen to be nationally representative of ninth-grade students in 2009. Therefore, the demographic makeup of the sample should reflect the demographics of the nation as a whole. While the overall sample is nationally representative, the subpopulations of rural/town and nonrural may not be. Descriptive statistics (weighted) for selected variables are summarized in Table 1. Overall, rural/town students were more likely to participate in dual enrollment, had less racial and ethnic diversity, were less likely to expect to pursue an advanced degree, and were more likely be unsure of their postsecondary education expectations as ninth graders.

Additional weighted descriptive statistics by dual enrollment participation are provided in Table 1b. This table shows the percentage of students in each SES quintile by rurality and dual enrollment participation, as well as the mean ninth-grade GPA for students in each category. Quintile 1 (SesQ1) represents the lowest SES quintile, and quintile 5 (SesQ5) is the highest quintile. For both rural/town and nonrural subpopulations, students in the higher SES quintiles (quintiles 4 and 5) were overrepresented in dual enrollment, and students in the lower SES quintiles (quintiles 1 and 2) were underrepresented.

Table 1

Study Participant Weighted Percentages for Demographic and School Characteristics

	City/suburb	Rural/town	Total
Variable	%	%	%
Dual enrollment			
Dual enrolled	34.6	40.2	36.5
Not dual enrolled	65.4	59.8	63.5
Sex			
Female	49.8	49.3	49.6
Male	50.2	50.7	50.4
Race/ethnicity			
American Indian/Alaska Native	0.3	1.5	0.7
Asian (non-Hispanic)	4.7	1.5	3.6
Black/African American (non-Hispanic)	14.7	11.5	13.6
Hispanic	27.3	12.2	22.0
More than one race (non-Hispanic)	7.8	7.6	7.7
White (non-Hispanic)	44.6	65.5	51.9
Region			
Northeast	20.3	12.0	17.4
Midwest	20.1	25.8	22.1
South	33.3	45.7	37.6
West	26.3	16.5	22.9
Type of school			
Public	90.8	96.6	92.9
Catholic or other private	9.2	3.4	7.2
Student educational expectations			
Don’t know	19.4	21.7	20.2
High school or less	14.2	12.3	13.6
Some college	6.1	7.9	6.7
Bachelor’s degree	16.8	17.9	17.2
Advanced degree	42.0	38.7	40.8
Missing	1.5	1.6	1.49

Table 1 (continued)

	City/suburb	Rural/town	Total
Variable	%	%	%
Parent educational aspirations			
Less than bachelor's	5.0	8.4	6.2
Bachelor's degree	16.4	19.9	17.6
Advanced degree	70.7	64.2	68.4
Missing	8.0	7.5	7.8
Postsecondary enrollment			
No enrollment	24.7	29.6	26.4
2-year or less	29.5	30.0	29.7
4-year	45.3	40.0	43.5
Missing	0.5	0.4	0.5

Table 1b

Weighted Percentages of Students in Each SES Quintile and Mean Ninth-Grade GPA by Rurality and Dual Enrollment (DE) Participation

	Rural/town			Nonrural		
Variable	No DE	DE	All	No DE	DE	All
SesQ1	23.9	13.0	19.5	25.3	19.3	23.2
SesQ2	23.7	21.6	22.9	20.8	16.5	19.3
SesQ3	20.1	19.0	19.7	16.5	18.8	17.3
SesQ4	16.4	23.0	19.0	16.9	18.5	17.5
SesQ5	15.9	23.4	18.9	20.6	26.8	22.7
Mean ninth-grade GPA	2.6	3.1	2.8	2.5	2.9	2.6

Dual Enrollment and Postsecondary Enrollment: Bivariate Model and SES

In the bivariate model, dual enrollment was associated with increased odds of postsecondary enrollment for both rural/town and nonrural students. Rural/town students who participated in dual enrollment had an increase in the odds of enrolling in a 2-year institution relative to not enrolling in postsecondary education by a factor of 2.21 (95% CI [1.68, 2.92]) and an increase in the odds of enrolling in a 4-year institution relative to no enrollment by a factor of 3.56 (95% CI [2.69, 4.71]). The odds ratio for enrollment in a 2-year institution was significantly different from the odds ratio for enrollment in a 4-year institution, $F(1, 199) = 14.73$, $p < .001$. In other words, without controlling for student and family characteristics, rural/town students who participated in dual enrollment were significantly more likely to enroll in both 2- and 4-year institutions compared to no postsecondary enrollment than non-dual enrolled students, and the increase in the odds of enrollment in 4-year institutions associated with dual enrollment was greater than the increase in the odds of enrollment in 2-year institutions.

Nonrural students who participated in dual enrollment were significantly more likely to enroll in 4-year institutions ($t = 6.47$, $p < .001$) than non-dual enrolled students, but there was no significant relationship between dual enrollment participation and enrollment in 2-year institutions ($t = 1.31$, $p = .191$). For nonrural students, dual enrollment was associated with an increase in the odds for enrolling in a 4-year institution by a factor of 2.29 (95% CI [1.78, 2.95]). Odds ratios, standard errors, *t*-values, and confidence intervals for the bivariate multinomial regression for postsecondary enrollment are provided in Table 2.

The odds ratio of enrolling in postsecondary education associated with dual enrollment did not change appreciably for either rural/town or nonrural students with the addition of SES to the model, indicating that the relationship between dual enrollment and postsecondary enrollment cannot be explained by differences in SES. Regression results for postsecondary enrollment including dual enrollment and SES are provided in Table 3.

Table 2

Results of Multinomial Regression for Postsecondary Enrollment: Bivariate Model

Rural/town postsecondary enrollment					
Variable	*OR*	*SE*	*t*	*p*	95% CI
Enrollment in 2-year institution vs. no enrollment					
Dual enrollment	**2.21**	**0.31**	**5.67**	**<.001**	**1.68, 2.92**
Intercept	0.79	0.06	-3.34	0.001	0.69, 0.91
Enrollment in 4-year institution vs. no enrollment					
Dual enrollment	**3.56**	**0.50**	**8.97**	**<.001**	**2.69, 4.71**
Intercept	0.85	0.08	-1.82	0.070	0.71, 1.01
Nonrural postsecondary enrollment					
Variable	*OR*	*SE*	*t*	*p*	95% CI
Enrollment in 2-year institution vs. no enrollment					
Dual enrollment	1.22	0.18	1.31	0.191	0.91, 1.64
Intercept	1.13	0.10	1.48	0.141	0.96, 1.34
Enrollment in 4-year institution vs. no enrollment					
Dual enrollment	**2.29**	**0.29**	**6.47**	**<.001**	**1.78, 2.95**
Intercept	1.39	0.10	4.66	<.001	1.21, 1.60

Note. Values in bold indicate results that are statistically significant ($p < .05$).

Table 3

Results of Multinomial Regression for Postsecondary Enrollment: Dual Enrollment and SES

Rural/town postsecondary enrollment						
Variable	*OR*	*SE*	*t*	*p*	95% CI	
Enrollment in 2-year institution vs. no enrollment						
Dual enrollment	**2.05**	**0.30**	**4.89**	**<.001**	**1.53**	**2.73**
SES	**1.92**	**0.15**	**8.45**	**<.001**	**1.65**	**2.24**
Intercept	0.99	0.08	-0.09	0.932	0.85	1.15
Enrollment in 4-year institution vs. no enrollment						
Dual enrollment	**3.03**	**0.48**	**6.99**	**<.001**	**2.22**	**4.15**
SES	**4.03**	**0.39**	**14.40**	**<.001**	**3.33**	**4.87**
Intercept	1.06	0.10	0.65	0.514	0.89	1.27
Nonrural postsecondary enrollment						
Variable	*OR*	*SE*	*t*	*p*	95% CI	
Enrollment in 2-year institution vs. no enrollment						
Dual enrollment	1.18	0.18	1.07	0.288	0.87	1.60
SES	**1.79**	**0.14**	**7.45**	**<.001**	**1.53**	**2.08**
Intercept	1.44	0.14	3.79	0.000	1.19	1.75
Enrollment in 4-year institution vs. no enrollment						
Dual enrollment	**2.13**	**0.29**	**5.51**	**<.001**	**1.63**	**2.79**
SES	**4.61**	**0.36**	**19.37**	**<.001**	**3.94**	**5.38**
Intercept	1.83	0.14	7.95	<.001	1.58	2.13

Note. Values in bold indicate results that are statistically significant ($p < .05$).

Dual Enrollment and Postsecondary Persistence: Bivariate Model and SES

For rural/town and nonrural subpopulations, dual enrollment was significantly and positively associated with continuing enrollment 3 years after high school graduation in 4-year, but not 2-year, institutions. The relationship between dual enrollment and postsecondary persistence did not change substantively with the addition of SES to the model. The odds ratios, standard errors, *t*-values, and confidence intervals for this regression are provided in Table 4.

The bivariate regressions demonstrated that dual enrollment was significantly associated with postsecondary enrollment and persistence for both rural/town and nonrural students, and these relationships did not change substantially with the addition of SES to the model. However, some student characteristics that previous research has shown to be related to postsecondary outcomes (e.g., demographic characteristics, prior student achievement, educational expectations, parent aspirations) may also be correlated with participation in dual enrollment. To address this potential selection bias into dual enrollment, I incorporated a variety of additional independent variables to control for student demographic and academic characteristics. Specifically, in addition to dual enrollment as an explanatory variable, the full model included control variables for SES, race/ethnicity, ninth-grade GPA, math self-efficacy, student educational expectations, parent educational aspirations (representing cultural capital), and whether students attended a public or private high school.

Dual Enrollment and Postsecondary Enrollment: Full Model

With the additional covariates added to the model, dual enrollment remained positively and significantly related to increased odds of postsecondary enrollment in both 2- and 4-year institutions, compared to no postsecondary enrollment, for rural/town students, $F(32, 168) = 15.65$, $p < .001$. Rural/town students who participated in dual enrollment had an odds ratio for enrollment in a 2-year institution of 1.53 (95% CI [1.09, 2.16]) and an odds ratio for enrollment in a 4-year institution of 1.56 (95% CI [1.10, 2.20]). In other words, dual enrolled rural/town students had odds of enrollment in both 2- and 4-year institutions

Table 4

Results of Multinomial Regression for Postsecondary Persistence: Dual Enrollment and SES

Rural/town postsecondary persistence						
Variable	*OR*	*SE*	*t*	*p*	95% CI	
Enrolled 2-year vs. no longer enrolled						
Dual enrollment	0.94	0.18	-0.33	0.743	0.64	1.38
SES	1.19	0.12	1.74	0.084	0.98	1.45
Intercept	0.55	0.07	-5.05	<.001	0.43	0.69
Enrolled 4-year or completed bachelor's degree vs. no longer enrolled						
Dual enrollment	**1.60**	**0.21**	**3.63**	**<.001**	**1.24**	**2.06**
SES	**2.71**	**0.24**	**11.08**	**<.001**	**2.27**	**3.24**
Intercept	1.13	0.11	1.21	0.228	0.93	1.37
Nonrural postsecondary persistence						
Variable	*OR*	*SE*	*t*	*p*	95% CI	
Enrolled 2-year vs. no longer enrolled						
Dual enrollment	1.17	0.16	1.14	0.255	0.89	1.54
SES	1.19	0.14	1.50	0.136	0.95	1.50
Intercept	0.67	0.05	-5.38	<.001	0.57	0.77
Enrolled 4-year or completed bachelor's degree vs. no longer enrolled						
Dual enrollment	**2.07**	**0.26**	**5.74**	**<.001**	**1.61**	**2.66**
SES	**3.00**	**0.25**	**13.39**	**<.001**	**2.55**	**3.52**
Intercept	1.45	0.11	5.14	<.001	1.26	1.68

Note. Values in bold indicate results that are statistically significant ($p < .05$).

about 1.5 times the odds of enrollment for non-dual enrolled students. While these values are smaller than those found in the bivariate model, this relationship remained significant. The odds ratios, standard errors, *t*-values, and confidence intervals for this regression are provided in Table 5.

In contrast to the bivariate model, an adjusted Wald chi-square test indicated odds ratios for enrollment in 2- and 4-year postsecondary institutions associated with dual enrollment for rural/town students were not significantly different. That is, the increase in the odds of enrolling in

Table 5

Results of Multinomial Regression for Postsecondary Enrollment: Rural/Town Students, Full Model

Variable	*OR*	*SE*	*t*	*p*	95% CI	
No postsecondary enrollment vs. enrollment in 2-year institution						
Dual enrollment	**1.53**	**0.27**	**2.46**	**.015**	**1.09**	**2.16**
SES	**1.68**	**0.21**	**4.23**	**<.001**	**1.32**	**2.14**
Gpa_9th	**1.87**	**0.24**	**4.87**	**<.001**	**1.45**	**2.40**
Math self-efficacy	1.02	0.08	0.24	.813	0.87	1.19
Female	**1.58**	**0.26**	**2.84**	**.005**	**1.15**	**2.18**
Asian	0.58	0.73	-0.43	.666	0.05	6.76
Black/African American	0.93	0.31	-0.22	.823	0.48	1.81
Hispanic	**2.18**	**0.66**	**2.58**	**.011**	**1.20**	**3.95**
More than 1 race	0.98	0.29	-0.08	.935	0.54	1.75
Student education expectations[a]						
Don't know	**2.76**	**0.77**	**3.65**	**<.001**	**1.60**	**4.77**
Some college	1.84	0.63	1.80	.073	0.94	3.60
Bachelor's degree	**2.37**	**0.56**	**3.64**	**<.001**	**1.49**	**3.79**
Advanced degree	**2.32**	**0.48**	**4.05**	**<.001**	**1.54**	**3.49**
Parent educational aspirations[b]						
Bachelor's degree	1.49	0.46	1.27	.206	0.80	2.75
Advanced degree	1.38	0.39	1.14	.255	0.79	2.41
Private school	2.11	1.48	1.06	.290	0.53	8.44
Intercept	0.06	0.03	-6.36	<.001	0.03	0.15
Enrollment in 4-year institution vs. no enrollment						
Dual enrollment	**1.56**	**0.27**	**2.52**	**.013**	**1.10**	**2.20**
SES	**2.56**	**0.34**	**7.06**	**<.001**	**1.97**	**3.33**
Gpa_9th	**5.31**	**0.81**	**10.93**	**<.001**	**3.93**	**7.17**
Math self-efficacy	0.96	0.08	-0.47	.637	0.82	1.13
Female	**1.43**	**0.24**	**2.17**	**.031**	**1.03**	**1.98**
Asian	0.97	1.02	-0.03	.980	0.12	7.67
Black/African American	**2.16**	**0.74**	**2.26**	**.025**	**1.10**	**4.25**
Hispanic	1.45	0.43	1.26	.211	0.81	2.60
More than 1 race	1.00	0.32	-0.00	.999	0.53	1.89
Student education expectations[a]						
Don't know	**2.66**	**0.92**	**2.82**	**.005**	**1.34**	**5.26**
Some college	1.40	0.58	0.80	.427	0.61	3.19
Bachelor's degree	**3.63**	**1.27**	**3.70**	**<.001**	**1.83**	**7.22**
Advanced degree	**4.62**	**1.43**	**4.94**	**<.001**	**2.51**	**8.51**

Table 5 (continued)

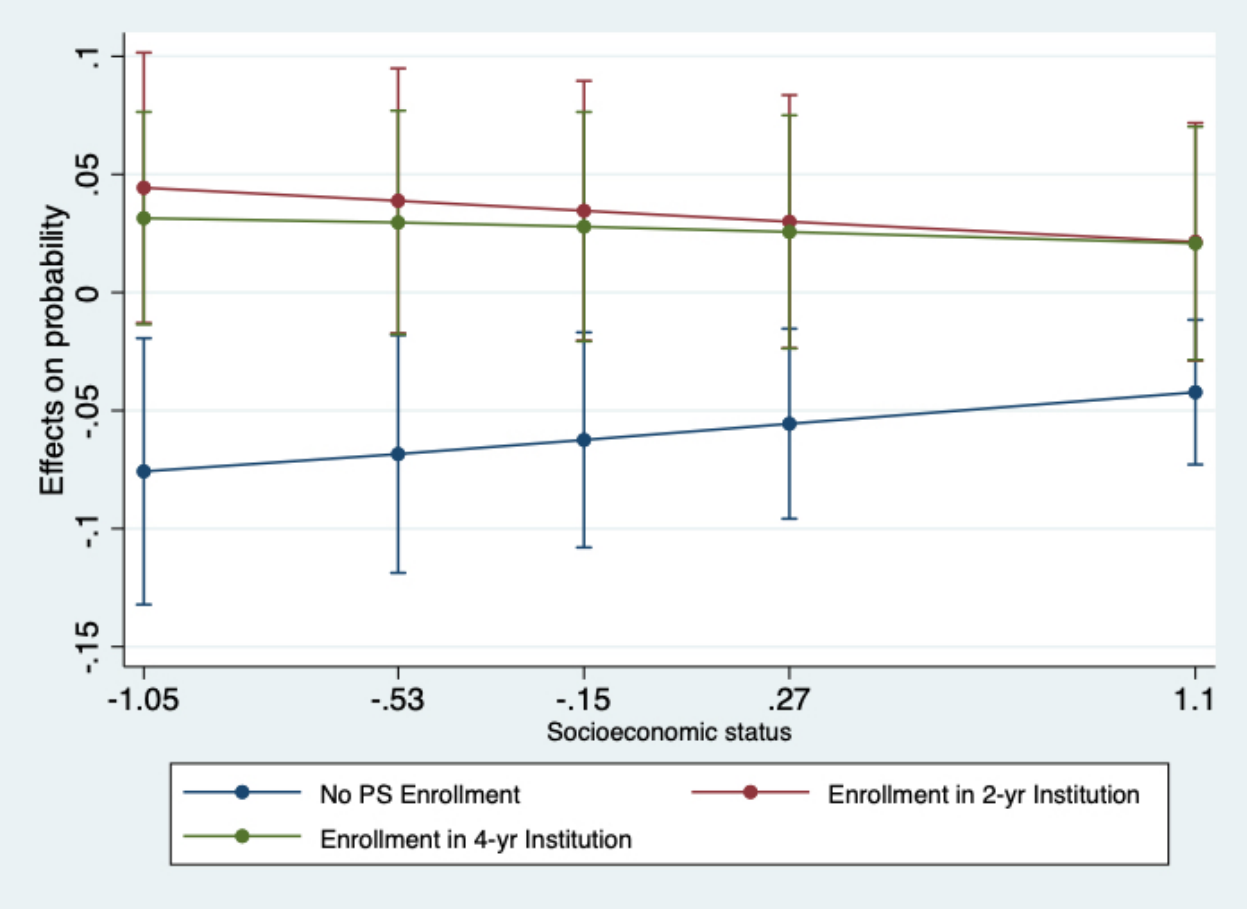
Variable	*OR*	*SE*	*t*	*p*	95% CI	
Parent educational aspirations[b]						
Bachelor's degree	**5.99**	**3.00**	**3.57**	**<.001**	**2.23**	**16.09**
Advanced degree	**6.83**	**3.36**	**3.91**	**<.001**	**2.59**	**17.99**
Private school	4.32	3.42	1.85	.066	0.90	20.61
Intercept	0.00	0.00	-9.61	<.001	0.00	0.00

Note. Values in bold indicate results that are statistically significant ($p < .05$).
[a] Student educational expectations are compared to the reference category high school or less.
[b] Parent educational aspirations are compared to the reference category less than bachelor's degree.

a 2-year institution associated with dual enrollment was not significantly different from the increase in the odds of enrollment in a 4-year institution.

Marginal predictions indicated the change in probability of postsecondary enrollment for dual enrolled rural/town students was greater for students at lower levels of SES than their more advantaged peers. The marginal effects for dual enrollment by SES are provided in Figure 1. The change in probability of postsecondary enrollment is plotted against SES; the SES values shown are the mean values for each SES quintile. Students at the lower end of the SES scale (at the mean value for the lowest quintile) had a 7.5% increase in the probability of enrollment, while those at average level of SES (at the mean value for the third, or middle quintile) had a 6.2% increase, and students at the higher end of the SES scale (at the mean value for the highest quintile) had a 4.2% increase in the probability of postsecondary enrollment. In other words, after controlling for a variety of

Figure 1
Average Marginal Effects of Dual Enrollment on Postsecondary Enrollment by SES for Rural/Town Students



demographic and academic characteristics, the increase in probability of postsecondary enrollment for dual-enrolled rural students with an SES index in the lowest quintile was nearly double that of students with an SES index in the highest quintile. A Wald chi-square test confirmed that these values are significantly different.

Not surprisingly, ninth-grade GPA was also significantly associated with the odds of postsecondary enrollment in both 2-year and 4-year institutions. The marginal effects of dual enrollment for rural/town students were at least as large for students with low prior academic achievement as for students with higher prior achievement. That is, the change in the probability of postsecondary enrollment associated with dual enrollment for students with low ninth-grade GPA was as great or greater than the change in probability for students with higher ninth-grade GPA. Marginal effects of dual enrollment by GPA for rural/town students are presented in Figure 2.

In contrast to results from the model for rural/town students, high school dual enrollment was no longer significant in predicting postsecondary enrollment in either 2- or 4-year institutions for nonrural students after controlling for demographic variables, prior achievement, cultural capital, and student educational expectations. Regression results from the full model for postsecondary enrollment for nonrural students are provided in Table 6.

Although there was no significant relationship between dual enrollment and enrollment in a 2- or 4-year institution compared to no enrollment for nonrural students, a subsequent analysis indicated a change in enrollment patterns associated with dual enrollment. A multinomial regression using enrollment in a 2-year institution as the base level indicated that for those students who enrolled in postsecondary education, dual enrolled nonrural students had significantly increased odds of enrolling in a 4-year rather than a 2-year institution. The odds ratio for enrollment in a 4-year institution compared to enrollment in a 2-year institution was 1.29 (95% CI [1.02, 1.63]), indicating a small but significant increase. Regression results for this analysis are provided in Table 7.

Figure 2

Average Marginal Effects of Dual Enrollment on Postsecondary Enrollment by GPA for Rural/Town Students

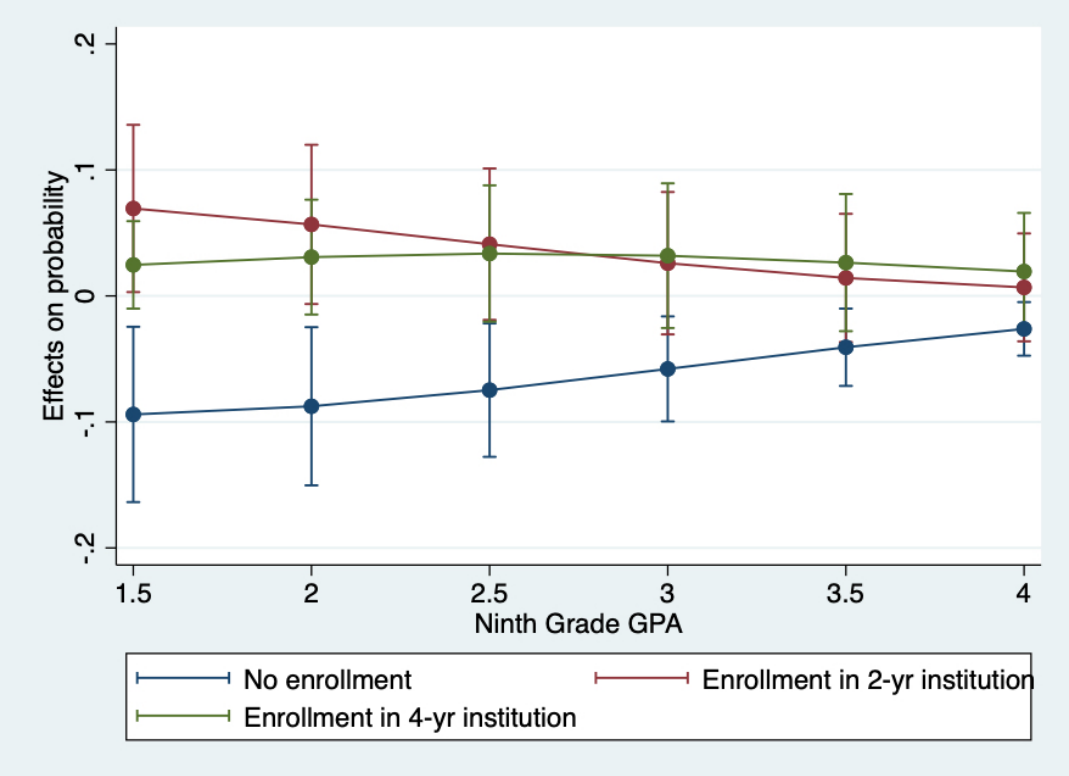


Table 6
Results of Multinomial Regression for Postsecondary Enrollment: Nonrural Students, Full Model

Variable	*OR*	*SE*	*t*	*p*	95% CI	
No postsecondary enrollment vs. enrollment in 2-year institution						
Dual enrollment	1.01	0.21	0.05	.962	0.68	1.51
SES	**1.63**	**0.17**	**4.62**	**<.001**	**1.33**	**2.02**
Gpa_9th	**1.82**	**0.21**	**5.20**	**<.001**	**1.45**	**2.28**
Math self-efficacy	1.08	0.10	0.80	.424	0.90	1.30
Female	1.30	0.24	1.44	.150	0.91	1.87
Asian	1.67	0.70	1.23	.221	0.73	3.82
Black/African American	1.67	0.43	1.97	.050	1.00	2.79
Hispanic	**2.37**	**0.50**	**4.06**	**<.001**	**1.56**	**3.61**
More than 1 race	1.47	0.47	1.20	.232	0.78	2.77
Student education expectations[a]						
Don't know	1.44	0.31	1.70	.090	0.94	2.21
Some college	**2.07**	**0.64**	**2.33**	**.021**	**1.12**	**3.82**
Bachelor's degree	**1.81**	**0.45**	**2.39**	**.018**	**1.11**	**2.95**
Advanced degree	**2.18**	**0.45**	**3.78**	**<.001**	**1.45**	**3.27**
Parent educational aspirations[b]						
Bachelor's Degree	**2.34**	**0.64**	**3.09**	**.002**	**1.36**	**4.03**
Advanced Degree	1.72	0.48	1.94	.054	0.99	2.98
Private School	1.15	0.48	0.34	.731	0.51	2.61
Intercept	0.09	0.03	-6.65	<.001	0.05	0.19
Enrollment in 4-year institution vs. no enrollment						
Dual enrollment	1.30	0.26	1.31	.191	0.88	1.93
SES	**2.94**	**0.34**	**9.36**	**<.001**	**2.34**	**3.69**
Gpa_9th	**5.76**	**0.70**	**14.35**	**<.001**	**4.53**	**7.32**
Math self-efficacy	1.05	0.10	0.45	.657	0.86	1.27
Female	1.34	0.22	1.79	.075	0.97	1.84
Asian	1.77	0.79	1.29	.199	0.74	4.27
Black/African American	**2.65**	**0.73**	**3.54**	**<.001**	**1.54**	**4.57**
Hispanic	**1.99**	**0.43**	**3.22**	**.002**	**1.31**	**3.04**
More than 1 race	1.33	0.39	0.99	.324	0.75	2.37
Student education expectations[a]						
Don't know	1.33	0.42	0.91	.364	0.72	2.47
Some college	1.22	0.57	0.43	.664	0.49	3.05
Bachelor's degree	**2.11**	**0.73**	**2.17**	**.032**	**1.07**	**4.18**
Advanced degree	**2.86**	**0.96**	**3.13**	**.002**	**1.48**	**5.54**

Table 6 (continued)

Variable	*OR*	*SE*	*t*	*p*	95% CI	
Parent educational aspirations[b]						
Bachelor's degree	**2.30**	**0.95**	**2.01**	**.045**	**1.02**	**5.22**
Advanced degree	**2.53**	**1.05**	**2.24**	**.026**	**1.12**	**5.75**
Private school	**3.06**	**0.98**	**3.50**	**.001**	**1.63**	**5.76**
Intercept	0.00	0.00	-11.44	<.001	0.00	0.01

Note. Values in bold indicate results that are statistically significant ($p < .05$).
[a] Student educational expectations are compared to the reference category high school or less.
[b] Parent educational aspirations are compared to the reference category less than bachelor's degree.

Table 7
Results of Multinomial Regression for Postsecondary Enrollment in 4-Year Compared to 2-Year Institutions: Nonrural Students

Variable	*OR*	*SE*	*t*	*p*	95% CI	
No postsecondary enrollment vs. enrollment in 2-year institution						
Dual enrollment	0.99	0.20	-0.05	0.962	0.66	1.48
SES	**0.61**	**0.07**	**-4.62**	**<.001**	**0.50**	**0.75**
Gpa_9th	**0.55**	**0.06**	**-5.20**	**<.001**	**0.44**	**0.69**
Math self-efficacy	0.93	0.09	-0.80	0.424	0.77	1.12
Female	0.77	0.14	-1.44	0.150	0.53	1.10
Asian	0.60	0.25	-1.23	0.221	0.26	1.37
Black/African American	0.60	0.16	-1.97	0.050	0.36	1.00
Hispanic	**0.42**	**0.09**	**-4.06**	**<.001**	**0.28**	**0.64**
More than 1 race	0.68	0.22	-1.20	0.232	0.36	1.28
Student education expectations[a]						
Don't Know	0.69	0.15	-1.70	0.090	0.45	1.06
Some college	**0.48**	**0.15**	**-2.33**	**0.021**	**0.26**	**0.89**
Bachelor's degree	**0.55**	**0.14**	**-2.39**	**0.018**	**0.34**	**0.90**
Advanced degree	**0.46**	**0.09**	**-3.78**	**<.001**	**0.31**	**0.69**
Parent educational aspirations[b]						
Bachelor's degree	**0.43**	**0.12**	**-3.09**	**0.002**	**0.25**	**0.73**
Advanced degree	0.58	0.16	-1.94	0.054	0.34	1.01
Private school	0.87	0.36	-0.34	0.731	0.38	1.96
Intercept	10.68	3.80	6.65	<.001	5.29	21.55
Enrollment in 4-year institution vs. enrollment in 2-year institution						
Dual enrollment	**1.29**	**0.15**	**2.11**	**0.036**	**1.02**	**1.63**
SES	**1.80**	**0.14**	**7.61**	**<.001**	**1.55**	**2.10**
Gpa_9th	**3.17**	**0.40**	**9.16**	**<.001**	**2.47**	**4.06**
Math self-efficacy	0.97	0.07	-0.44	0.659	0.84	1.12
Female	1.02	0.14	0.17	0.862	0.78	1.35
Asian	1.06	0.29	0.22	0.827	0.62	1.80
Black/African American	**1.59**	**0.37**	**1.99**	**0.048**	**1.00**	**2.52**
Hispanic	0.84	0.16	-0.94	0.350	0.58	1.21
More than 1 race	0.91	0.20	-0.45	0.655	0.59	1.39

Table 7 (continued)

Variable	*OR*	*SE*	*t*	*p*	95% CI	
Student education expectations[a]						
Don't Know	0.92	0.26	-0.29	0.770	0.53	1.59
Some college	0.59	0.20	-1.58	0.116	0.31	1.14
Bachelor's degree	1.17	0.33	0.55	0.584	0.67	2.04
Advanced degree	1.31	0.37	0.95	0.341	0.75	2.30
Parent educational aspirations[b]						
Bachelor's degree	0.98	0.38	-0.04	0.966	0.45	2.13
Advanced degree	1.47	0.54	1.06	0.290	0.72	3.03
Private school	**2.66**	**0.59**	**4.41**	**<.001**	**1.72**	**4.11**
Intercept	0.03	0.02	-7.04	<.001	0.01	0.09

Note. Values in bold indicate results that are statistically significant ($p < .05$).
[a] Student educational expectations are compared to the reference category high school or less.
[b] Parent educational aspirations are compared to the reference category less than bachelor's degree.

Dual Enrollment and Postsecondary Persistence: Full Model

When controlling for student characteristics and achievement, dual enrollment was no longer significantly related to postsecondary persistence for rural/town students ($t = 1.23$, $p = .221$), but it was significantly associated with increased odds of continuing enrollment in a 4-year institution for nonrural students ($t = 2.13$, $p = .035$). Results for the multinomial regression for postsecondary persistence are presented in Tables 8 (rural/town) and 9 (nonrural).

Table 8
Results of Multinomial Regression for Postsecondary Persistence: Rural/Town Students

Variable	*OR*	*SE*	*t*	*p*	95% CI	
Enrolled 4-year or completed bachelor's degree vs. no longer enrolled						
Dual enrollment	1.22	0.20	1.23	.221	0.88	1.69
SES	**2.20**	**0.26**	**6.74**	**< .001**	**1.75**	**2.78**
Gpa_9th	**3.61**	**0.51**	**9.06**	**< .001**	**2.73**	**4.77**
Math self-efficacy	0.90	0.07	-1.29	.198	0.76	1.06
Female	1.02	0.16	0.11	.909	0.75	1.39
Asian	1.76	1.47	0.67	.501	0.34	9.16
Black/African American	**2.48**	**0.88**	**2.56**	**.011**	**1.23**	**4.99**
Hispanic	1.69	0.50	1.77	.078	0.94	3.04
more than 1 race	0.77	0.25	-0.80	.425	0.41	1.46
Student education expectations[a]						
Don't Know	1.19	0.50	0.41	.680	0.52	2.72
Some college	0.90	0.48	-0.20	.840	0.31	2.59
Bachelor's degree	1.53	0.66	0.98	.328	0.65	3.57
Advanced degree	1.59	0.64	1.16	.247	0.72	3.52

Table 8 (continued)

Variable	*OR*	*SE*	*t*	*p*	95% CI	
Parent educational aspirations[b]						
Bachelor's degree	3.03	1.83	1.84	.068	0.92	9.99
Advanced degree	**3.67**	**2.23**	**2.15**	**.033**	**1.11**	**12.15**
Private school	1.50	0.67	0.90	.367	0.62	3.62
Intercept	0.00	0.00	-6.56	<.001	0.00	0.02

Note. Values in bold indicate results that are statistically significant ($p < .05$).
[a] Student educational expectations are compared to the reference category high school or less.
[b] Parent educational aspirations are compared to the reference category less than bachelor's degree.

Table 9
Results of Multinomial Regression for Postsecondary Persistence: Nonrural Students

Variable	*OR*	*SE*	*t*	*p*	95% CI	
Enrolled 4-yr or completed bachelor's degree vs. no longer enrolled						
Dual enrollment	**1.44**	**0.25**	**2.13**	**.035**	**1.03**	**2.01**
SES	**2.30**	**0.23**	**8.12**	**.000**	**1.88**	**2.81**
Gpa_9th	**4.02**	**0.55**	**10.14**	**<.001**	**3.07**	**5.27**
Math self-efficacy	0.99	0.07	-0.13	.898	0.86	1.14
Female	**1.48**	**0.22**	**2.64**	**.009**	**1.10**	**1.98**
Asian	**2.79**	**0.98**	**2.90**	**.004**	**1.39**	**5.59**
Black/African American	1.22	0.31	0.80	.425	0.74	2.01
Hispanic	0.87	0.17	-0.74	.458	0.59	1.27
More than 1 race	0.68	0.17	-1.49	.137	0.41	1.13
Student education expectations[a]						
Don't Know	0.62	0.31	-0.97	.335	0.23	1.66
Some college	0.52	0.28	-1.21	.228	0.18	1.52
Bachelor's degree	0.80	0.40	-0.45	.653	0.30	2.14
Advanced degree	0.81	0.43	-0.39	.694	0.29	2.29
Parent educational aspirations[b]						
Bachelor's degree	2.90	2.07	1.49	.137	0.71	11.82
Advanced degree	4.04	2.88	1.96	.051	0.99	16.46
Private school	**1.98**	**0.41**	**3.28**	**.001**	**1.30**	**2.99**
Intercept	0.01	0.01	-6.33	<.001	0.00	0.04

Note. Values in bold indicate results that are statistically significant ($p < .05$).
[a] Student educational expectations are compared to the reference category high school or less.
[b] Parent educational aspirations are compared to the reference category less than bachelor's degree.

Discussion

Dual enrollment is gaining popularity as a strategy to increase college enrollment, particularly for rural students (D'Amico et al., 2013; Gagnon et al., 2021). Although prior research (reviewed by An & Taylor, 2019) has established the association between dual enrollment and increased postsecondary enrollment, persistence, and degree completion, the relationship between dual enrollment and postsecondary outcomes may be different for rural students, who have different postsecondary enrollment patterns than nonrural students. Despite growing interest in rural education issues, there has been very little research on dual enrollment outcomes specifically for rural youth.

This study helps to fill the gap in research on dual enrollment outcomes for rural and town students. There are two main significant findings from this research. The first is that dual enrollment outcomes varied between rural and nonrural students after controlling for demographic characteristics, prior achievement, and educational expectations. The second is that rural students with lower socioeconomic status appear to benefit more from dual enrollment than their wealthier peers.

Although dual enrollment was associated with positive postsecondary outcomes for both rural/town and nonrural students, the nature of this relationship differed by rurality. After controlling for student and family characteristics, dual enrollment was significantly related to increased overall odds of postsecondary enrollment for rural/town students with a roughly equal increase in odds of enrolling in a 2-year or 4-year institution. Participation in dual enrollment was not significantly related to persistence for rural/town students. For nonrural students, dual enrollment was associated with increased odds of persistence, but there was no significant change in the odds of postsecondary enrollment.

In contrast to Taylor's (2015) findings, but consistent with Edmunds et al. (2020), my results indicate that students from lower levels of SES benefit more from dual enrollment than their wealthier peers. Although the association between dual enrollment and positive postsecondary outcomes was weaker when controlling for students' demographic and achievement characteristics, the relationship remained significant, and the marginal effects of dual enrollment on the probability of postsecondary enrollment were greater for rural students with lower SES. Furthermore, students with lower prior achievement (measured by ninth-grade GPA) appeared to benefit at least as much from dual enrollment as students with higher ninth-grade GPA.

Limited access to advanced coursework may impact rural students' self-efficacy beliefs (Morton et al., 2018) while lack of exposure to the social and economic benefits of college in rural communities (Li, 2019) may influence their outcome expectations for participation in postsecondary education. Furthermore, social reproduction theory suggests that students from families with higher SES are more likely to enter high school with well-defined plans for postsecondary education (Terenzini et al., 2001). One mechanism by which dual enrollment may affect postsecondary outcomes for socioeconomically disadvantaged rural students is through influencing their expectations for postsecondary education. Descriptive statistics from the HSLS indicated that rural students have lower expectations for postsecondary education and are more likely to enter high school without clear postsecondary plans. Therefore, dual enrollment may have a stronger influence on the self-efficacy and outcome beliefs of rural students as compared to nonrural students who enter high school with more clearly developed postsecondary plans and aspirations. Using HSLS data, Wells et al. (2023) found that disparities in postsecondary enrollment between rural and nonrural students were only evident for low- and middle-SES students, with little difference in postsecondary enrollment for higher-SES students. This finding suggests that more affluent rural students are likely to be college bound regardless of dual enrollment participation, while lower-SES students may be more likely to develop higher postsecondary aspirations through their participation in dual enrollment. A rigorous examination of this hypothesis is beyond the scope of this study but would be an interesting topic for future research.

Policy and Leadership Implications and Recommendations

These findings have important implications for rural education policy and leadership. Currently, several states are engaged in efforts to expand dual enrollment opportunities (Eden, 2020; Rodriguez et al., 2023). If these policies aim to reduce equity gaps, policymakers need to critically evaluate differential access to dual enrollment opportunities. Although my findings indicate socioeconomically disadvantaged students benefit more from dual enrollment than their more advantaged peers, unequal participation in dual enrollment may still increase educational inequities. However, carefully constructed dual enrollment programs with targeted outreach, recruitment, and support for socioeconomically disadvantaged students have the potential not only to increase postsecondary enrollment, but also to decrease socioeconomic disparities in access to postsecondary education for rural students.

To disrupt the process of social reproduction and expand access to postsecondary educational opportunities, college access initiatives must change the landscape of perceived value and expectations of success for socioeconomically disadvantaged and other historically marginalized student groups. Specifically, dual enrollment

has the potential to provide early opportunities for success in postsecondary education, thus influencing students' educational self-efficacy beliefs and outcome expectations. Furthermore, dual enrollment experiences can help students to develop college-relevant cultural capital, for example greater familiarity with formal language structures and knowledge of systems and processes (e.g. enrollment, registration, financial aid, and student support systems) within the community college. However, if access to these opportunities is not equally distributed or if the value of these opportunities is not apparent to historically underserved students, dual enrollment programs may serve to further concentrate educational advantage among already advantaged student groups—thus reinforcing social reproduction through the education system.

Dual enrollment policies also need to critically examine factors, including eligibility requirements, that create barriers for traditionally marginalized student groups. For example, policies and programs that increase access to dual enrollment by reducing or eliminating GPA and test score requirements can extend the benefits of dual enrollment to a wider student population. Clearly, these programs will need to provide appropriate support to students with lower academic skills to ensure successful completion of dual enrollment courses, but my results indicate dual enrollment can be a promising strategy for increasing postsecondary access for rural students with lower high school achievement. Given the known correlation between SES and traditional measures of academic achievement (Serna & Wolfe, 2017), removing barriers to dual enrollment based on GPA and test scores is an important step in increasing equity and improving educational outcomes for all students.

Rural community colleges play a critical role in efforts to expand access to postsecondary education through dual enrollment, both because community colleges provide most dual enrollment opportunities in the United States (Fink et al., 2017) and because rural students are more likely than nonrural students to begin their postsecondary education at community colleges (Wells et al., 2023). To increase equity in postsecondary access, community colleges and rural high schools should work together to recruit and support socioeconomically disadvantaged students in dual enrollment programs.

Dual enrollment, however, is not a silver bullet for improving postsecondary outcomes. The positive association between dual enrollment and postsecondary enrollment is significant but modest. Although dual enrollment is one tool for increasing rural and town students' participation in higher education and increasing equity in postsecondary access, it should be part of a comprehensive system of student support. By itself, dual enrollment can have an impact for individual students but is unlikely to substantially disrupt the process of social reproduction.

References

An, B. P. (2013). The impact of dual enrollment on college degree attainment: Do low-SES students benefit? *Educational Evaluation and Policy Analysis*, *35*(1), 57–75. https://doi.org/10.3102/0162373712461933

An, B. P., & Taylor, J. L. (2019). A review of empirical studies on dual enrollment: Assessing educational outcomes. In M. B. Paulsen & L. W. Perna (Eds.), *Higher education: Handbook of theory and research* (Vol. 34, pp. 99–151). https://doi.org/10.1007/978-3-030-03457-3_3

Arnold, M. L., Newman, J. H., Gaddy, B. B., & Dean, C. B. (2005). A look at the condition of rural education research: Setting a direction for future research. *Journal of Research in Rural Education*, *20*(6), 1–25. https://jrre.psu.edu/sites/default/files/2019-08/20-6.pdf

Baker, T. L., & Vélez, W. (1996). Access to and opportunity in postsecondary education in the United States: A review. *Sociology of Education*, *69*, 82–101. https://doi.org/10.2307/3108457

Bandura, A. (1986). *Social foundations of thought and action: A social learning theory*. Prentice Hall.

Belley, P., & Lochner, L. (2007). *The changing role of family income and ability in determining educational achievement* (NBER Working Paper No. 13527). National Bureau of Economic Research. https://doi.org/10.3386/w13527

Bourdieu, P. (1986). The forms of capital. In J. Richardson (Ed.), *Handbook of theory and research for the sociology of education* (pp. 241–258). Greenwood Press.

Bozick, R., Alexander, K., Entwisle, D., Dauber, S., & Kerr, K. (2010). Framing the future: Revisiting the place of educational expectations in status attainment. *Social Forces*, *88*(5), 2027–2052. https://doi.org/10.1353/sof.2010.0033

Brennan, J., Durazzi, N., & Tanguy, S. (2013). *Things we know and don't know about the wider benefits of higher education: A review of the recent literature* (BIS Research Paper No. 133). Department for Business, Innovation and Skills. https://www.gov.uk/government/publications/wider-benefits-of-higher-education-literature-review

Brick, J., & Kalton, G. (1996). Handling missing data in survey research. *Statistical Methods in Medical Research*, *5*(3), 215–238. https://doi.org/10.1177/096228029600500302

Burns, L., & Leu, K. (2019). *Advanced placement, international baccalaureate, and dual-enrollment courses: Availability, participation, and related outcomes for 2009 ninth-graders: 2013* (NCES 2019-430). U.S. Department of Education, National

Center for Education Statistics. https://nces.ed.gov/pubs2019/2019430.pdf

Byun, S.-Y., Irvin, M. J., & Meece, J. L. (2015). Rural–nonrural differences in college attendance patterns. *Peabody Journal of Education*, *90*(2), 263–279. https://doi.org/10.1080/0161956x.2015.1022384

Byun, S.-Y., Meece, J. L., & Agger, C. A. (2017). Predictors of college attendance patterns of rural youth. *Research in Higher Education*, *58*(8), 817–842. https://doi.org/10.1007/s11162-017-9449-z

Byun, S.-Y., Meece, J. L., & Irvin, M. J. (2012). Rural-nonrural disparities in postsecondary educational attainment revisited. *American Educational Research Journal*, *49*(3), 412–437. https://doi.org/10.3102/0002831211416344

Cunha, F., Karahan, F., & Soares, I. (2011). Returns to skills and the college premium. *Journal of Money, Credit and Banking*, *43*(S1), 39–86. https://doi.org/10.1111/j.1538-4616.2011.00410.x

D'Amico, M. M., Morgan, G. B., Robertson, S., & Rivers, H. E. (2013). Dual enrollment variables and college student persistence. *Community College Journal of Research and Practice*, *37*(10), 769–779. https://doi.org/10.1080/10668921003723334

Duprey, M. A., Pratt, D. J., Jewell, D. M., Cominole, M. B., Fritch, L. B., Ritchie, E. A., Rogers, J. E., Wescott, J. D., Wilson, D. H., & Christopher, E. M. (2018). *High school longitudinal study of 2009 (HSLS:09) base-year to second follow-up*. U.S. Department of Education, National Center for Education Statistics. https://nces.ed.gov/pubs2018/2018140.pdf

Duprey, M. A., Pratt, D. J., Wilson, D. H., Jewell, D. M., Brown, D. S., Caves, L. R., Kinney, S. K., Mattox, T. L., Ritchie, N. S., Rogers, J. E., Spagnardi, C. M., Wescott, J. D., & Christopher, E. M. (2020). *High school longitudinal study of 2009 (HSLS:09) postsecondary education transcript study and student financial aid records collection*. U.S. Department of Education, National Center for Education Statistics. https://nces.ed.gov/pubs2020/2020004.pdf

Eden, M. (2020). *Advanced opportunities: How Idaho is reshaping high schools by empowering students*. Manhattan Institute for Policy Research. https://files.eric.ed.gov/fulltext/ED608442.pdf

Edmunds, J. A., Grebing, E., Coyle, V., & Rosof, L. (2022). Addressing inequity: Expanding access to college-level courses for high school students. *Journal of Education for Students Placed at Risk*, *27*(4), 1–25. https://doi.org/10.1080/10824669.2022.2041999

Edmunds, J. A., Unlu, F., Furey, J., Glennie, E., & Arshavsky, N. (2020). What happens when you combine high school and college? The impact of the early college model on postsecondary performance and completion. *Educational Evaluation and Policy Analysis*, *42*(2), 257–278. https://doi.org/10.3102/0162373720912249

Ehrenberg, R. G., & Smith, C. L. (2004). Analyzing the success of student transitions from 2- to 4-year institutions within a state. *Economics of Education Review*, *23*(1), 11–28. https://doi.org/10.1016/s0272-7757(03)00078-5

Fink, J., Jenkins, D., & Yanagiura, T. (2017). *What happens to students who take community college "dual enrollment" courses in high school?* Community College Research Center. https://files.eric.ed.gov/fulltext/ED578185.pdf

Gagnon, D., Liu, J., & Cherasaro, T. (2021). *Understanding access to and participation in dual enrollment by locale and income level (REL 2021-089)*. U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Northwest. http://ies.ed.gov/ncee/edlabs

Gagnon, D. J., & Mattingly, M. J. (2016). Advanced placement and rural schools. *Journal of Advanced Academics*, *27*(4), 266–284. https://doi.org/10.1177/1932202x16656390

Gecas, V. (1989). The social psychology of self-efficacy. *Annual Review of Sociology*, *15*(1), 291–316. https://doi.org/10.1146/annurev.so.15.080189.001451

Geverdt, D. E. (2019). *Education demographic and geographic estimates (EDGE) program: Locale boundaries file documentation, 2017* (NCES 2018-115). U.S. Department of Education, National Center for Education Statistics. https://nces.ed.gov/programs/edge/docs/EDGE_NCES_LOCALE.pdf

Giani, M., Alexander, C., & Reyes, P. (2014). Exploring variation in the impact of dual-credit coursework on postsecondary outcomes: A quasi-experimental analysis of Texas students. *The High School Journal*, *97*(4), 200–218. https://doi.org/10.1353/hsj.2014.0007

Giroux, H. A. (1981). Hegemony, resistance, and the paradox of educational reform. *Interchange on Education*, *12*(2), 3–26. https://doi.org/10.1007/bf01192105

Grubb, J. M., Scott, P. H., & Good, D. W. (2017). The answer is yes: Dual enrollment benefits students at the community college. *Community College Review*, *45*(2), 79–98. https://doi.org/10.1177/0091552116682590

Henneberger, A. K., Witzen, H., & Preston, A. M. (2022). A longitudinal study examining dual enrollment as a strategy for easing the transition to college and career for emerging adults. *Emerging Adulthood*, *10*(1), 225–236. https://doi.org/10.1177/2167696820922052

Hout, M. (2012). Social and economic returns to college education in the United States. *Annual Review of Sociology*, *38*(1), 379–400. https://doi.org/10.1146/annurev.soc.012809.102503

Ingels, S. J., Pratt, D. J., Herget, D. R., Burns, L. J., Dever, J. A., Ottem, R., Rogers, J. E., Jin, Y., Leinwand, S., & loGerfo, L. (2011). *High school longitudinal study of 2009 (HSLS:09) base year data file documentation* (NCES 2011-328). U.S. Department of Education, National Center for Education Statistics. https://files.eric.ed.gov/fulltext/ED566098.pdf

Irvin, M. J., Meece, J. L., Byun, S., Farmer, T. W., & Hutchins, B. C. (2011). Relationship of school context to rural youth's educational achievement and aspirations. *Journal of Youth and Adolescence*, *40*(9), 1225–1242. https://doi.org/10.1007/s10964-011-9628-8

Jez, S. J. (2014). The differential impact of wealth versus income in the college-going process. *Research in Higher Education*, *55*(7), 710–734. https://doi.org/10.1007/s11162-014-9332-0

Koricich, A., Chen, X., & Hughes, R. P. (2018). Understanding the effects of rurality and socioeconomic status on college attendance and institutional choice in the United States. *The Review of Higher Education*, *41*(2), 281–305. https://doi.org/10.1353/rhe.2018.0004

Koziol, N. A., Arthur, A. M., Hawley, L. R., Bovaird, J. A., Bash, Irstie L., McCormick, C., & Welch, G. W. (2015). Identifying, analyzing, and communicating rural: A quantitative perspective. *Journal of Research in Rural Education*, *30*(4), 1–14. https://doi.org/10.18113/P8JRRE3004

Kremer, K. P. (2022). Predictors of college success outcomes in emerging adults: The role of high school dual enrollment courses. *Emerging Adulthood*, *10*(1), 188–196. https://doi.org/10.1177/2167696820916639

Lee, J., Fernandez, F., Ro, H. K., & Suh, H. (2022). Does dual enrollment influence high school graduation, college enrollment, choice, and persistence? *Research in Higher Education*, *63*(5), 1–24. https://doi.org/10.1007/s11162-021-09667-3

Lent, R. W., Brown, S. D., & Hackett, G. (1994). Toward a unifying social cognitive theory of career and academic interest, choice, and performance. *Journal of Vocational Behavior*, *45*(1), 79–122. https://doi.org/10.1006/jvbe.1994.1027

Li, X. (2019). Challenging both rural advantage and disadvantage narratives: The effects of family factors on American student college expectations in the early 2010s. *Journal of Research in Rural Education*, *35*(5), 1–16. https://doi.org/10.26209/jrre3505

Long, J. C., Delamater, P. L., & Holmes, G. M. (2021). Which definition of rurality should I use? The relative performance of 8 federal rural definitions in identifying rural-urban disparities. *Medical Care*, *59*(10S5), S413–S419. https://doi.org/10.1097/MLR.0000000000001612

Long, J. S., & Freese, J. (2014). *Regression models for categorical dependent variables using Stata* (3rd ed.). Stata Press.

Long, J. S., & Mustillo, S. A. (2021). Using predictions and marginal effects to compare groups in regression models for binary outcomes. *Sociological Methods & Research*, *50*(3), 1284–1320. https://doi.org/10.1177/0049124118799374

Ma, J., Pender, M., & Welch, M. (2019). *Education pays 2019: The benefits of higher education for individuals and society*. College Board. https://research.collegeboard.org/media/pdf/education-pays-2019-full-report.pdf

Manly, C. A., Wells, R. S., & Kommers, S. (2020). Who are rural students? How definitions of rurality affect research on college completion. *Research in Higher Education*, *61*(6), 764–779. https://doi.org/10.1007/s11162-019-09556-w

McDonough, P. M., Gildersleeve, R. E., & Jarsky, K. M. (2010). The golden cage of rural college access: How higher education can respond to the rural life. In K. A. Schafft & A. Y. Jackson (Eds.), *Rural education for the twenty-first century: Identity, place, and community in a globalizing world* (pp. 191–209). Pennsylvania State University Press.

Moreno, M., McKinney, L., Burridge, A., Rangel, V. S., & Carales, V. D. (2021). Access for whom? The impact of dual enrollment on college matriculation among underserved student populations in Texas. *Community College Journal of Research and Practice*, *45*(4), 1–18. https://doi.org/10.1080/10668926.2019.1688734

Morton, T. R., Ramirez, N. A., Meece, J. L., Demetriou, C., & Panter, A. T. (2018). Perceived barriers, anxieties, and fears in prospective college students from rural high schools. *The High School Journal*, *101*(3), 155–176. https://doi.org/10.1353/hsj.2018.0008

Museus, S. D., Lutovsky, B. R., & Colbeck, C. L. (2007). Access and equity in dual enrollment programs: Implications for policy formation. *Higher Education in Review*, *4*, 1–19.

Pretlow, J., & Wathington, H. D. (2014). Expanding dual enrollment: Increasing postsecondary access for all? *Community College Review*, *42*(1), 41–54. https://doi.org/10.1177/0091552113509664

Reber, S., & Smith, E. (2023). *College enrollment disparities: Understanding the role of academic preparation*. Center on Children and Families at Brookings. https://www.brookings.edu/articles/college-enrollment-disparities/

Rivera, L. E., Kotok, S., & Ashby, N. (2019). Access to dual enrollment in the United States: Implications for equity and stratification. *Texas Education Review*, *7*(2), 14–29. http://dx.doi.org/10.26153/tsw/2282

Roscigno, V. J., Tomaskovic-Devey, D., & Crowley, M. (2006). Education and the inequalities of place. *Social Forces*, *84*(4), 2121–2145. https://doi.org/10.1353/sof.2006.0108

Rodriguez, O., Payares-Montoya, D., Ugo, I., & Gao, N. (2023). *Improving college access and success through dual enrollment*. Public Policy Institute of California. https://www.ppic.org/publication/improving-college-access-and-success-through-dual-enrollment/

Ruiz, R., & Perna, L. W. (2017). The geography of college attainment: Dismantling rural "disadvantage." In M. Cahalan, L. W. Perna, M. Yamashita, R. Ruiz, & K. Franklin (Eds.), *Indicators of higher education equity in the United States: 2017 trend report* (pp. 95–102). Pell Institute for the Study of Higher Education, Council for Education Opportunity and Alliance for Higher Education and Democracy of the University of Pennsylvania. https://files.eric.ed.gov/fulltext/ED583542.pdf

Rust, K., & Rao, J. (1996). Variance estimation for complex surveys using replication techniques. *Statistical Methods in Medical Research*, *5*(3), 283–310. https://doi.org/10.1177/096228029600500305

Serna, G. R., & Woulfe, R. (2017). Social reproduction and college access: Current evidence, context, and potential alternatives. *Critical Questions in Education*, *8*(1), 1–16. https://files.eric.ed.gov/fulltext/EJ1129434.pdf

Shapiro, D., Dundar, A., Huie, F., Wakhungu, P. K., Yuan, X., Nathan, A., & Hwang, Y. (2017). *Tracking transfer: Measures of effectiveness in helping community college students to complete bachelor's degrees* (Signature Report No. 13). National Student Clearinghouse Research Center. https://files.eric.ed.gov/fulltext/ED580214.pdf

Spencer, G., & Maldonado, M. (2021). Determinants of dual enrollment access: A national examination of institutional context and state policies. *AERA Open*, *7*, Article 23328584211041628. https://doi.org/10.1177/23328584211041628

Taylor, J. L. (2015). Accelerating pathways to college: The (in)equitable effects of community college dual credit. *Community College Review*, *43*(4), 355–379. https://doi.org/10.1177/0091552115594880

Taylor, J. L., & Yan, R. (2018). Exploring the outcomes of standards-based concurrent enrollment and advanced placement in Arkansas. *Education Policy Analysis Archives*, *26*, Article 123. https://doi.org/10.14507/epaa.26.3647

Terenzini, P. T., Cabrera, A. F., & Bernal, E. M. (2001). *Swimming against the tide* (Research Report No. 2001-1). College Board. https://files.eric.ed.gov/fulltext/ED562879.pdf

Thier, M., & Beach, P. (2019). Stories we don't tell: Research's limited accounting of rural schools. *School Leadership Review*, *15*(2), Article 5. https://scholarworks.sfasu.edu/slr/vol14/iss2/5

Thier, M., Longhurst, J. M., Grant, P. D., & Hocking, J. E. (2021). Research deserts: A systematic mapping review of U.S. rural education definitions and geographies. *Journal of Research in Rural Education*, *37*(2), 1–24. https://doi.org/10.26209/jrre3702

Tobolowsky, B. F., & Allen, T. O. (2016). On the fast track: Understanding the opportunities and challenges of dual credit. *ASHE Higher Education Report*, *42*(3), 7–106. https://doi.org/10.1002/aehe.20069

Wells, R. S., Chen, L., Bettencourt, G. M., & Haas, S. (2023). Reconsidering rural-nonrural college enrollment gaps: The role of socioeconomic status in geographies of opportunity. *Research in Higher Education*, *64*(8), 1089–1112. https://doi.org/10.1007/s11162-023-09737-8

Wells, R. S., Manly, C. A., Kommers, S., & Kimball, E. (2019). Narrowed gaps and persistent challenges: Examining rural-nonrural disparities in postsecondary outcomes over time. *American Journal of Education*, *126*(1), 1–31. https://doi.org/10.1086/705498

Wright, R. E. (1995). Logistic regression. In L. G. Grimm & P. R. Yarnold (Eds.), *Reading and understanding multivariate statistics* (pp. 217–244). American Psychological Association.

Xie, Y., Killewald, A., & Near, C. (2016). Between- and within-occupation inequality. *The Annals of the American Academy of Political and Social Science*, *663*(1), 53–79. https://doi.org/10.1177/0002716215596958

Xu, D., Solanki, S., & Fink, J. (2021). College acceleration for all? Mapping racial gaps in advanced placement and dual enrollment participation. *American Educational Research Journal*, *58*(5), 954–992. https://doi.org/10.3102/0002831221991138