

RESEARCH ARTICLE

Grading Between the Locales: Socioeconomic Status and Ninth-Grade Course Failures



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Abstract: This study explores the grading disparities among ninth-grade students within the American educational system, emphasizing the comparative analysis between economically disadvantaged students (indicated by free or reduced-price lunch status) and their more advantaged counterparts across urban, suburban, and rural locales. Drawing on a robust dataset of 65,017 first-time, full-time ninth graders from Arkansas, spanning the academic years 2020–21 to 2021–22, this research employs logistic regression analysis to uncover the nuanced relationships of socioeconomic status and geographical setting on course failure rates. The ninth grade is highlighted as a critical juncture in the U.S. educational trajectory, serving as a foundational year that significantly influences students' future academic and career pathways. My findings reveal that, although rural students initially present with lower failure rates, a detailed logit analysis accounting for individual and district-level characteristics demonstrates that rural ninth graders face the highest risk of course failure, especially among those with free or reduced lunch status. These results underscore the pressing need for implementing equitable grading practices and bolstering professional development for educators in rural areas to mitigate these disparities. This study contributes to the broader field of educational equity by highlighting systemic challenges and advocating for targeted interventions to support disadvantaged students, particularly in the pivotal year of ninth grade.

Keywords: ninth grade, economically disadvantaged, rural, grading equity

1. Introduction

The transition from middle to high school marks a pivotal juncture in the educational journey of students, with the ninth grade often highlighted as a critical year that significantly influences future academic and career trajectories [1, 2]. This period is characterized not only by the academic challenges it presents but also by its capacity to magnify existing educational disparities. Among the various factors contributing to these disparities, grading practices play a crucial role, shaping students' futures in profound ways [3]. Traditional grading practices, with their roots in the early 20th century, were designed to address a broad spectrum of student needs [4]. However, these practices have come under scrutiny for their failure to accurately reflect students' understanding and academic competence. This is particularly true for poor students, who, research suggests, are disproportionately affected by these grading systems [3, 5–7].

This study seeks to investigate grading disparities among ninth-grade students, focusing on variations between economically disadvantaged students and their more advantaged peers across different regional locales. Utilizing a comprehensive dataset of 65,017 first-time, full-time ninth graders from Arkansas, this research employs logistic regression analysis to explore how socioeconomic status (SES) and geographical setting impact course failure rates. The choice of the ninth grade as the focal point is intentional, underscoring its significance within the American

educational system as a foundational year that sets the stage for students' future educational and vocational paths.

In aligning with the broader discourse on educational equity, this paper positions itself within the existing scholarly dialogue, examining how subjective grading practices can perpetuate educational inequalities. By scrutinizing the role of free or reduced lunch (FRL) status as a proxy for socioeconomic disparity and the influence of regional locales on grading outcomes, this research aims to illuminate the nuanced dynamics at play. It challenges traditional grading systems and advocates for the adoption of more equitable practices that can better serve all students, regardless of their socioeconomic background or geographic location.

Through this investigation, the study contributes to a deeper understanding of the systemic challenges within educational assessment and highlights the need for targeted interventions to support disadvantaged students. By doing so, it not only adds to the scholarly conversation on educational disparities but also offers practical insights for educators, policymakers, and stakeholders striving to create a more equitable educational landscape.

2. Literature Review

2.1. Ninth grade and course failures

The ninth grade is a defining moment in a student's academic journey, the "make-or-break" year, with research highlighting its importance for future educational trajectories [1, 2]. The University of Chicago's Consortium on School Research underscores the robust link between ninth-grade grade point

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averages (GPAs) and subsequent academic achievements [1, 8]. This pivotal year also encapsulates a myriad of emotional, social, and psychological transitions [9–11]. These changes, like shifting friendships, emerging stressors, differing academic achievements, and evolving peer dynamics, can influence academic performance and future successes [12–14]. These factors converge in the ninth-grade year, increasing students' academic challenges.

Starting ninth grade with course failures can dramatically impede a student's chances of high school graduation [15]. For instance, in Chicago, a single core course failure during this critical year can reduce the likelihood of graduation by four times [1]. This trend is not isolated; similar findings have emerged from research in Philadelphia, where ninth-grade course failures strongly predict dropout rates [16]. The BLIND in Arkansas identifies ninth-grade GPAs as dependable predictors of high school graduation and subsequent college enrollment [17]. Given the significant influence of ninth-grade outcomes on students' academic futures, understanding the multifaceted nature of how these outcomes relate to longer-term educational achievements is essential. Furthermore, since course grades play a pivotal role, exploring the underlying components contributing to a grade becomes imperative.

2.2. Grades

Grading practices have remained unchanged for decades [4]. Established in the early 20th century to address the diverse needs of an expanding student body, traditional grading practices encompassed elements like homework, class participation, punctuality, behavior, no retakes, extra credit, grade averaging, and student effort [3]. This holistic grade, sometimes called a "hodgepodge" [18], led to final grades that merged conflicting student elements, prompting calls for change to the traditional grade.

Feldman [3] argues that traditional grading systems, which commonly assign letter grades such as A for scores between 100–90 points, B for 89–80 points, and so forth, with F denoting 59–0 points, often do not accurately represent a student's understanding. Factors like assigning zeros for incomplete homework, factoring in non-academic behaviors, prohibiting retakes, averaging marks, and incorporating behavioral assessments can skew these grades away from genuine academic competence [19]. As a result, such traditional grading approaches fall short of capturing students' true proficiency in aligning with academic standards [4]. Noted researchers Guskey [20] and Wormeli [21] underscore that such grading often fails to provide precise feedback and does not align with educational benchmarks. This inconsistency in grading is further illuminated by a study where 73 teachers assigned a wide range of scores, from 50 to 96, to the identical assignment, indicating a pronounced subjectivity in evaluations [22]. Moreover, while Wormeli [21] argues that not offering students opportunities for test and assignment retakes can diminish learning opportunities, Marzano and Heflebower [23] also caution that the practice of averaging grades in the traditional system might camouflage specific areas where students struggle.

Grades play a pivotal role in shaping students' futures, influencing everything from college admissions and scholarship eligibility to GPA rankings, retention rates, and even lifetime earning potential [8, 17, 20, 24]. As grades hold such significant importance in students' lives, scholars like Guskey [20] champion the need for more precise grading interpretations to bolster student fairness. In response, many educational institutions are gravitating toward "standards-based

grading" (SBG), which evaluates students exclusively on their mastery of content [25]. Yet, the consistency in implementing SBG varies across schools [26, 27]. While comprehensive studies on the direct impact of SBG are scant, experts in the field believe SBG can heighten student motivation and simplify grading processes for educators [28]. Equitable grading, suggested by Feldman [3] and SBG, adds valuable insight to ongoing discussions about grading reforms.

Brookhart et al.'s [29] meta-analysis underscores the efficacy of grading practices rooted exclusively in standards, utilizing multiple proofs of mastery. These methods are found to be more valid, reliable, and meaningful. They empower educators to convey students' progress more precisely to parents and other stakeholders [28]. Moreover, they advance grading equity, foster student engagement, and facilitate more profound learning [30]. By sidestepping the pitfalls of averaging, such an approach enables educators to pinpoint and tackle academic hurdles directly [31]. Grading should epitomize a credible, valid, and transparent communication medium, spotlighting areas for student growth and confirming their attainment of learning benchmarks [32].

While Feldman [3] underscores the positive shifts in student attitudes and outcomes resulting from implementing equitable grading practices, concerns among teachers about their potential influence on student agencies persist [33]. Additionally, some researchers argue that a holistic view of a student through a single grade is adequate. Easton et al. [8] reveal that ninth-grade GPAs exhibit superior predictive accuracy for college enrollment compared to state-mandated test scores. Grades could provide valuable insights into various aspects beyond academic capabilities, including a student's adaptability and resilience in life challenges [34]. Grades often encompass more than academic achievements, as indicated by a survey of Arkansas teachers considering factors like effort and participation when determining students' final grades [27]. The comprehensive nature of high school grades is further emphasized by Allensworth and Clark [35], who argue that they offer a multifaceted view of a student's diverse skills, behaviors, and the range of expectations encountered across different classes, bolstering their overall validity [8, 36].

However, critics contend that the subjective nature of these measures can lead to grading inconsistencies and inaccuracies [28, 37]. Once teacher-evaluated subjective measures start to influence final grades, disparities could begin to show in the likelihood of course failure. This ongoing debate questions the reliability of grades as accurate and equitable measures of academic ability [3, 28]. Nevertheless, the external generalizability of these grading findings, especially those from urban locales like Chicago, remains in question, raising concerns regarding their applicability to suburban or rural contexts. Traditional grading systems are critiqued for their potential to perpetuate disparities and hinder disadvantaged and lower SES students. This emphasizes the need to scrutinize how subjective grading, by potentially embracing arbitrariness and perpetuating stereotypes, acts as a cog in the machinery of educational inequality, further complicating the quest for equitable assessment practices.

2.3. Socioeconomic status

Traditional grading in public schools often benefits students from privileged backgrounds [3, 5–7]. Entwined with implicit biases related to socioeconomic factors, these practices can lead to unequal

evaluations [38, 39]. Students of lower SES are frequently graded more harshly, a pattern observed universally, irrespective of school poverty levels [40, 41]. Such disparities intensify educational inequalities, significantly burdening the economically disadvantaged.

The research underscores the sway of socioeconomic elements in teachers' student assessments [42]. Griffin and Townsley [43] note distinct differences between students eligible for FRL and their counterparts. Yet, this does not consider other contextual factors like the school environment or individual teacher biases. SES-related grading biases underscore the significant discretion given to educators in their grading decisions [27].

Tobisch and Dresel [44] found that educators tend to overrate students they perceive to come from wealthier backgrounds. In contrast, students from less privileged backgrounds often face more stringent grading criteria, risking deflated GPAs [45]. For instance, low-income ninth-grade students in Washington State in 2016 had a higher course failure rate than their wealthier peers [46]. An analogous trend emerges in Chicago, with students from underprivileged neighborhoods consistently scoring lower GPAs [8]. Moreover, Arkansas researchers find that economically disadvantaged students are likelier to fail a course than their advantaged peers [7].

External factors, like family resources and available time for homework, can indirectly skew grades for low SES students, further deepening societal inequalities [6, 47–49]. Detaching academic aptitude from non-cognitive behaviors is essential to combat grading biases [3]. Practices like assigning zeros can dampen motivation [50]. While many advantaged students believe effort should mirror grades [51], those from disadvantaged backgrounds may receive undue penalties due to factors beyond their control [3, 52].

In summary, students from marginalized socioeconomic backgrounds deserve grading focused solely on academic capability, untainted by biases related to their financial standing. Such a system would champion fairness and precision, especially during the pivotal ninth-grade year—a crucial determinant for future opportunities. The intricate relationship between SES and academic achievements highlights the urgency for objective grading systems. Due to the urban locale findings in Chicago and the complex nature of socioeconomically disadvantaged disparities, adding locale classifications can enhance our field's understanding of SES differences and course failure likelihoods. The research field awaits a more detailed study of locale and SES course failure likelihoods.

2.4. Rural locales

While the differences between failure rates among differing regional locales remain limited, some research arises to highlight rural teachers' grading practices. Hardré [53] underscores that educators in rural environments grapple with additional obstacles when attempting to mitigate grading biases in their assessment methods. To combat such biases, Hardre suggests that rural teachers adopt rubrics—a recognized equitable grading practice [3, 53]. Contrarily, Deaton [54] observed no notable GPA difference between rural students who had taken advanced high school courses and those who had not. This suggests that specific high school course outcomes might not significantly influence rural students' academic trajectories.

Miranda and Rodriguez [55] shed light on rural students' slightly inferior course grades compared to their urban peers. Both groups show a positive correlation between elevated developmental social–

emotional skills and improved course grades. However, this study did not account for factors such as previous academic achievements, attendance records, or disciplinary actions—variables that could influence course failure rates.

While the desire among rural Arkansas educators may lean toward assessing students based purely on their academic competencies—mirroring the sentiments found among rural Iowa educators in Buckmiller et al. [26]—the prevailing challenge remains. These educators cite insufficient resources and professional development funding as hurdles to implementing fairer grading practices [27]. Rural schools have an evident inclination toward SBG. Yet, a palpable research gap exists: no study conclusively examines the disparity in course failure rates among students from different locales, especially when accounting for comparable academic prowess. The field needs exploration that examines whether rural educators' grading practices align with their expressed aspirations. A focused investigation into the failure likelihoods across varied locales will provide invaluable insights, helping bridge the current gap in the literature.

2.5. This study

Building on this existing literature, this study explores the relationships between ninth-grade course performance, student SES, and students' school locale classification in predicting course failure. While the scholarly community has recognized early high school performance as a crucial determinant of educational outcomes and acknowledged the interplay between SES and geographical locale, a notable gap persists. Specifically, there is limited insight into how course failure likelihoods are distributed across regional locales, mainly when focusing on ninth grade alone.

Much of the research focuses on urban school environments, particularly those from Chicago-based scholars [1, 2]. This focus narrows the broader understanding of urban settings' unique challenges and dynamics, often sidelining students' experiences in suburban and rural settings. In contrast, my study taps into a broad and robust dataset, encompassing students from various school locales. This inclusivity enables a thorough investigation of how rural students' experiences and outcomes stand compared to their suburban and urban school counterparts. By including diverse school locales, we expand the study's reach, aiming for a more comprehensive understanding of the factors driving ninth-grade course failures. Harnessing the power of logistic analysis, I intend to answer the following research questions:

- 1) R1: When comparing students of similar ability levels across different regional locales in Arkansas (urban, suburban, and rural), which locale has the highest likelihood of ninth-grade course failure?
- 2) R2: And among FRL students, does the likelihood of failure vary depending on the regional locale where they attend school?

3. Methods

3.1. Data and sample

This study examines explicitly ninth-grade students, reflecting prior research that emphasizes the pivotal role of ninth-grade course outcomes [1, 7, 8, 17, 27]. Using a well-established research-practice partnership with the BLIND, I obtained anonymized data for ninth-

grade students from the Arkansas Department of Education (ADE). These aggregated data consist of 65,017 first-time, full-time ninth-grade students spanning the academic years of 2020–21 to 2021–22. It also encompasses eighth-grade achievement scores from the 2019–20 academic year. Notably, due to the suspension of Arkansas state assessments amid the COVID-19 pandemic in 2019–20, I have included seventh-grade achievement scores from 2018 to 19 as a prior achievement score for the ninth-grade students of 2020–21. The dataset provides insights into student demographics, programmatic attributes, absences, disciplinary infractions, and course grades. This study’s outcome of interest is a binary indicator for ninth-grade students who failed at least one course, defined by grades such as F, E, NC, I-0, or scores of 59 and below. Within the dataset, student course grades are represented either numerically or through letter values. I provide a detailed breakdown of the demographic and programmatic traits of this study’s pooled sample in Table 1.

Table 1
Ninth-grade student demographic and programmatic characteristics

	<i>n</i>	%
Female	31,886	49.0
White	39,081	60.1
Black	12,484	19.2
Hispanic	9,398	14.5
Other races	4,054	6.2
Free or reduced-price lunch	39,722	61.1
Gifted and talented	8,097	12.5
English language learning	3,999	6.2
Special education	7,894	12.1
Total	65,017	100.0

Table 1 provides a comprehensive breakdown of ninth-grade students’ demographic and programmatic characteristics. Of the total sample of 65,017 students, 49.0% (31,886) are female. In terms of racial demographics, the majority are White students, accounting for 60.1% (39,081), followed by Black students at 19.2% (12,484), Hispanic students at 14.5% (9,398), and other racial categories representing 6.2% (4,054). A significant portion, 61.1% (39,722) of the students, participate in the free or reduced-price lunch (FRL) program. Additionally, 12.5% (8,097) of the students are identified as gifted and talented (GT), while 6.2% (3,999) are English language learning (ELL). Students with special educational (SPED) needs comprise 12.1% (7,894) of the sample.

These data also come with indicators for regional locale classifications by district locations. I provide Table 2 to show how student demographic and programmatic characteristics vary by Arkansas’s urban, suburban, and rural locations.

Table 2 depicts the ninth-grade students’ demographic and programmatic characteristics, categorized by regional locale—urban, suburban, and rural settings. Of the total cohort, 30.3% (19,707) are from urban regions, 34.2% (22,220) are from suburban areas, and the largest proportion of students in this sample, 35.5% (23,090), come from rural locales. Examining gender distributions, urban regions have the highest percentage of female students at 49.6% (9,781) in this sample. Racially, White students make up a majority in rural areas with 72.7% (16,790) of the cohort, a figure higher than urban (42.8%, 8,424) and suburban (62.4%, 13,867) locales.

Table 2
Ninth-grade student demographic and programmatic characteristics by regional locale

	Urban		Suburban		Rural	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Female	9,781	49.6	10,848	48.8	11,257	48.8
White	8,424	42.8	13,867	62.4	16,790	72.7
Black	5,047	25.6	4,770	21.5	2,667	11.6
Hispanic	4,550	23.1	2,473	11.1	2,375	10.3
Other races	1,686	8.6	1,110	5.0	1,258	5.5
Free or reduced-price lunch	11,448	58.1	13,948	62.8	14,326	62.0
Gifted and talented	2,411	12.2	2,752	12.4	2,934	12.7
English language learning	2,121	10.8	994	4.5	884	3.8
Special education	2,296	11.7	2,702	12.2	2,896	12.4
Total	19,707	30.3	22,220	34.2	23,090	35.5

Conversely, urban regions have a pronounced Black student population of 25.6% (5,047) compared to 11.6% (2,667) in rural areas. The Hispanic student count is largest in urban areas with 23.1% (4,550), whereas rural locales account for 10.3% (2,375). Concerning FRL students, the locale regions range from 58 to 63% participation. The GT student percentage remains relatively consistent across the regions, with rural areas slightly leading at 12.7% (2,934). Notably, the percentage of ELL students is larger in urban regions at 10.8% (2,121) as opposed to a mere 3.8% (884) in rural settings. Students receiving special education services are relatively uniformly distributed across the regions, with rural areas having 12.6% (2,896) participation.

3.2. Methodology

To address my research questions, “When comparing students of similar ability levels across different regional locales (urban, suburban, and rural), which locale has the highest likelihood of ninth-grade course failure? And among FRL students, does the likelihood of failure vary depending on the regional locale they attend school?” I employ a logit model, a statistical approach given this study’s binary outcome of interest—failing at least one course in a ninth-grade year. One of the variables of interest, student FRL participation, frequently correlates with various student demographic and programmatic characteristics. I integrate these as control variables within the model to account for intercorrelation [56]. A logit model is preferable over an ordinary least squares regression in this scenario due to the binary nature of this study’s dependent variable [56]. I also utilize district-fixed effects to help control unobserved variables fixed over time, like the concentration of student demographics or characteristics in certain districts, to further account for these relationships between independent and dependent variables [57]. Accordingly, this study’s statistical model to explore the research question is structured as follows:

$$\text{Prob(Failure}_i) = \beta_0 + \beta_1\text{FRL}_i + \beta_2\text{locale}_i + \beta_3(\text{FRL} * \text{locale})_i + \beta_4\chi_i + \beta_5\Omega_i + \epsilon_i$$

Where:

- 1) Failure i is the binary outcome variable, representing whether student i has failed at least one course in their ninth-grade year.
- 2) β_1 is an indicator variable, representing participation in the FRL program by student i .
- 3) β_2 is a categorical variable representing the regional locales—urban, suburban, or rural—within the ninth-grade sample for each student i .
- 4) β_3 represents the interaction between two variables of interest, FRL status for student i and the regional locale of student i .
- 5) χ_i is a vector representing the characteristics of student i , including gender, race, ethnicity, GT status, ELL status, special education status, math and ELA prior achievement scores, absences, and disciplinary infractions. It is associated with corresponding β_4 coefficients.
- 6) Ω_i is a vector reflecting the district characteristics for student i , including district FRL compositions, district fixed effects, and log of district enrollment, each associated with the corresponding β_5 coefficients.
- 7) ϵ_i accounts for the random error associated with the student i

In this model, I employ robust standard errors, and to facilitate interpretation, I render this study’s logit estimates as average marginal effects.

3.3. Validity criteria

In this section, I clarify the steps taken to ensure the validity of the findings of this study. The utilization of FRL status as a proxy for SES is grounded in its widespread recognition and availability through the ADE data. Although not an exhaustive measure of socioeconomic diversity, FRL status serves as a viable and relevant indicator within the scope of this research. Additionally, the classification of regional locales is based on nationally recognized identifiers, providing a consistent framework for comparing urban, suburban, and rural settings.

It is important to note that the relationships identified in this study are interpretative rather than causal. The geographic locale of students is not deemed a direct cause of the observed variations in course grades. Instead, the study examines the association between students’ locale and grading disparities, acknowledging the multifaceted influences on educational outcomes.

Regarding external validity, the findings are considered applicable beyond the immediate context of Arkansas, extending to other regions in the United States with similar geographical and demographic diversity. This extrapolation is predicated on the assumption that the patterns observed in this study are reflective of broader trends within the American educational system, although further research is necessary to confirm this applicability across different states and educational contexts.

4. Results

4.1. Descriptive trends

I first present some descriptive trends for my pooled ninth-grade sample and then deliver this study’s logit analysis results. To describe the course failure rates across Arkansas ninth-grade students by regional locales, I present Table 3. I define failure as a student who has failed at least one course in their ninth-grade year.

Table 3 presents the comparative percentages of ninth-grade course failures across varying student demographics, programmatic

Table 3
Ninth-grade failure percentages by student demographic and programmatic characteristics and regional locales

	Urban	Suburban	Rural	Arkansas
Male	32.6	31.7	30.0	31.3
Female	28.3	24.2	22.8	25.0
White	21.0	22.8	24.3	23.0
Black	46.9	43.4	39.2	43.9
Hispanic	31.1	28.6	27.1	29.4
Other races	26.9	25.3	28.4	26.9
FRL	39.4	35.1	31.7	35.1
Non-FRL	18.1	16.1	17.9	17.4
GT	14.9	8.7	8.8	10.6
ELL	42.4	33.9	33.4	38.3
SPED	34.6	30.0	27.3	30.4
Total	30.5	28.0	26.5	28.2

characteristics, and regional locales. The failure rate for male students in rural areas is 30%, which is lower than Arkansas on average (31.3%) in urban (32.6%) and suburban (31.7%) areas. Female students in rural areas (22.8%) fail courses at a considerably lower rate than male students. In terms of racial demographics, while White students exhibit a course failure rate of 24.3% in rural settings, this is marginally higher than the urban rate of 21.0% but lower than the statewide average for Arkansas at 23.0%. Black students in rural areas have a failure rate of 39.2%, appreciably lower than the 46.9% seen in urban regions. Hispanic students in rural locales have a failure rate of 27.1%, which is somewhat below their urban (31.1%) and suburban (28.6%) counterparts. Students characterized as other races in rural areas have a failure rate of 28.4%, higher than urban (26.9%) and suburban (25.3%) regions.

Analyzing programmatic characteristics, 31.7% of FRL students in rural locales fail at least one course, markedly lower than the 39.4% in urban locales. On average, only 17.4% of non-FRL students fail at least one course in Arkansas, lower than the FRL percentage of course failure of 35.1%. GT students in rural (8.8%) and suburban (8.7%) areas have lower failure rates than urban (14.9%) areas, and ELL students in rural (33.4%) and suburban (33.9%) areas have lower failure rates than urban (42.2%) areas, too. Lastly, SPED students in rural settings have a failure rate of 27.3%, the lowest among the three locales, with urban at 34.6% and suburban at 30.0%. Overall, 26.5% of ninth-grade students in rural areas fail at least one course, below both urban (30.5%) and suburban (28.0%) averages, and the general rate for Arkansas is 28.2%.

While these descriptive trends shed light on variations in ninth-grade course failure rates across different demographic and programmatic groups among Arkansas regional locales, they only offer a preliminary glimpse into the complex landscape of course failures. These tabulated percentages provide contextual disparities, identifying overarching potential areas of concern. However, they do not account for critical factors that could influence course failure, such as students’ prior achievement, demographic and programmatic characteristics, student absences, student disciplinary infractions, or the unique characteristics of the districts they attend. A more refined logit analysis is needed to explore the relationship further and accurately assess the

individual contributions of student characteristics to failure outcomes. This analytical approach integrates student demographic and programmatic characteristics, student prior achievement, district FRL compositions, district enrollment sizes, and district fixed effects to isolate the influences of primary variables. By incorporating these controls, I bolster this study’s model’s robustness and enhance this study’s estimate’s reliability.

4.2. Statistical logit analysis

I present the results of the logit model in Table 4.

While descriptive trends highlighted the lowest number of course failures for ninth-grade students in rural locales, similar ability students among similar districts are likelier to fail in rural areas than in urban and suburban areas. Holding all else equal, ninth-grade students in rural settings are 5.6 percentage points more likely to fail at least one course in their ninth-grade year compared to students in urban settings, and this is statistically significant at the 99% confidence level. Moreover, holding all else equal, ninth-grade students in rural settings are 4.8 percentage points more likely to fail at least one course during their ninth-grade year compared to students in suburban settings, and this is statistically significant at the 99% confidence level.

Similar ability students among similar districts who are enrolled in the FRL program are more likely to fail their courses compared to students who are not enrolled in the FRL program. Holding all else equal, FRL students are seven percentage points more likely to fail at least one course in their ninth-grade year than non-FRL students, which is statistically significant at the 99% confidence level. I analyze the interaction term in the logit analysis to explore the relationship between FRL status among differing regional locale settings.

FRL-eligible students in urban areas have a 6.5 percentage point higher probability of failing a course than non-FRL students in the same urban settings, with this difference statistically significant at the 99% confidence level. Similarly, in suburban areas, FRL students are 6.7 percentage points more likely to fail than their non-FRL counterparts, again statistically significant at the 99% confidence level. Rural FRL students demonstrate the highest disparity, 7.8 percentage points more likely to fail than non-FRL rural students, significant at the 99% confidence level. When comparing FRL students in rural settings to urban and suburban settings, FRL students have a larger likelihood of course failure when located in rural settings. Holding all else equal, FRL students in rural schools are six percentage points more likely to fail at least one-course ninth-grade year than FRL students in urban schools, and this is statistically significant at the 99% confidence level. Moreover, FRL students in rural schools are 5.3 percentage points more likely to fail at least one course ninth-grade year than FRL students in suburban schools, which is statistically significant at the 99% confidence level.

5. Discussion

This study’s findings illuminate insights into the intricacies of course failures among ninth-grade students across various regional locales in Arkansas. By examining both descriptive trends and employing a more granular logit analysis, I gain a comprehensive understanding of the dynamics at play, revealing nuances that might otherwise be obscured in a generalized view. In this section, I further explore the implications of these results, juxtaposing them with the extant literature and pondering the broader repercussions for education stakeholders.

Table 4
Ninth-grade student factors related to the probability of course failure

Variable	Contrast
Locale	
Rural vs Urban	5.6*** (0.01)
Urban vs Suburban	-0.1 (0.02)
Rural vs Suburban	4.8*** (0.02)
FRL	
1 vs 0	7.0*** (0.00)
Locale#FRL	
Urban#1 vs Urban#0	6.5*** (0.00)
Suburban#1 vs Suburban#0	6.7*** (0.01)
Rural#1 vs Rural#0	7.8*** (0.01)
Rural#1 vs Urban#1	6.0*** (0.01)
Suburban#1 vs Urban#1	0.8 (0.02)
Rural#1 vs Suburban#1	5.3*** (0.01)
Sex	
Male vs Female	4.6*** (0.00)
Race/Ethnicity	
Black vs White	-0.9 (0.01)
Hispanic vs White	-0.9 (0.01)
Other races vs White	-0.6 (0.01)
Hispanic vs Black	1.8** (0.01)
Other races vs Black	1.5 (0.01)
Other races vs Hispanic	-0.3 (0.01)
GT	
1 vs 0	-6.4*** (0.01)
ELL	
1 vs 0	-4.1*** (0.01)
SPED	
1 vs 0	-16.5*** (0.00)
Observations	65,017
Pseudo R2	0.25

Note: Results displayed as average marginal effects. Robust standard errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

5.1. SES and rural locales

The pronounced disparities in this study between FRL and non-FRL students across all regional settings underscore the weight of SES in student academic outcomes. Traditional grading in public

schools often privileges students from more affluent backgrounds, thereby disadvantaging students from lower socioeconomic backgrounds, a trend that persists even when school poverty levels and student characteristics are considered [3, 5–7, 40, 41]. This literature echoes the findings of this own study.

The descriptive analysis highlighted demographic and programmatic variations in ninth-grade course failure rates across Arkansas regional locales. Exploring specifically FRL status—my proxy for SES—I found that 35.1% of FRL ninth-grade students are failing at least one course statewide. On the contrary, non-FRL students had a considerably lower failure rate of 17.4% statewide. This suggests that the socioeconomic divide plays a tangible role in course failure rates, consistent with existing literature [42, 43].

At first glance, the descriptive statistics suggest that rural locales fare better than urban students, contrary to Miranda and Rodriguez [55], with ninth-grade students experiencing relatively lower course failure rates than their urban and suburban counterparts. However, the logit analysis paints a more complex picture. When holding other influential factors constant—like student ability and characteristics and district characteristics—rural students appear to be at a heightened risk of course failures than their urban and suburban peers. This highlights that while rural areas might demonstrate encouraging tabulations that do not account for characteristics, underlying factors like professional developments provided to teachers might cause discrepancies in course failure likelihoods between rural and urban/suburban counterparts [27]. Like Hardré's [53] findings, rural educators face different challenges when grading students without bias or subjectivity.

Like the urban context of Chicago cited by Easton et al. [8], urban locales exhibited higher failure rates for FRL students than suburban and rural areas. However, when controlling for various student and district factors in the logit analysis, FRL students in rural areas had an even greater likelihood of failure than their urban and suburban counterparts. This is more like Miranda and Rodriguez's [55] findings, yet these results account for similar ability students who attend similar districts.

5.2. Implications

The notion of students' final grades serving as a holistic reflection of a student—encompassing more than just their academic aptitude and content knowledge—is challenged by the observed differences in course failure likelihoods. Some might argue that disparities between low SES students and their more privileged counterparts and between students in rural and other locales stem from variations in attributes such as grit and perseverance. However, Gorski [6] cautioned against such a reductionist view, asserting that it perpetuates biases and allows subjective considerations to cloud evaluations of students. Furthermore, the logit analysis results, which consider students with comparable academic achievements, attendance patterns, disciplinary records, demographic and programmatic characteristics, and similar school environments, serve as a stark counterargument. This raises the question: What should a student's final grade reflect? Suppose students, comparable in every academic aspect but differing only by SES, are exposed to divergent chances of failure. Does this not demand a critical review of existing grading frameworks? These findings underscore the pressing need for educators to scrutinize potential biases and the subjectivity entrenched in their grading practices, which might penalize students for non-academic factors [3].

The results of this study further accentuate the pronounced grading chasm between rural and urban or suburban locales. For

instance, if a ninth-grade student transitions from an urban or suburban institution to a rural school, their susceptibility to course failure increases. Such observations corroborate previous findings, underscoring the imperative for rural schools to be equipped with grading methodologies that are objective, precise, and impervious to biases from professional development [3, 26, 27]. While educators in rural settings are inclined toward SBG practices, they often confront uncertainties regarding its implementation, primarily attributed to the financial constraints of rural institutions [58].

5.3. Recommendations and future research

Given the observed disparities in course failure likelihoods across different socioeconomic backgrounds and regional settings, educators, school administrators, and policymakers should comprehensively review prevailing grading systems. While traditional grading systems might serve some students well, they may inadvertently penalize others, particularly those from lower socioeconomic backgrounds and rural locales. Schools should consider adopting more objective, bias-resistant grading frameworks such as SBG. Rural schools should try to reallocate professional development funds to new opportunities for grading practice workshops.

While this study sheds light on the grading disparities between rural and urban/suburban schools, future research should consider adopting a longitudinal approach, tracking students over extended periods to understand the long-term implications of grading disparities on academic outcomes and career trajectories. Additionally, qualitative methods should be employed to understand the root causes of these grading disparities. Interviews and focus groups with educators and students could provide deeper insights into the lived experiences and perceptions surrounding grading practices in rural settings.

5.4. Limitations

While this study fills a significant gap in the literature, some limitations arise. This study's focus on urban, suburban, and rural locales might not fully represent other states' urban, suburban, and rural locales. The regional characteristics specific to Arkansas, both socioeconomic and cultural, may influence the findings, partially limiting the generalizability of results. In addition, this study's cross-sectional design and pooled sample provide a snapshot of grading disparities at a specific point in time. This approach may not capture grading practices' dynamic and evolving nature and their effects over time. Additionally, using FRL status as a proxy for SES might not encompass the entire spectrum of economic hardships students face, but the data were limited to FRL status only. Lastly, while the study controlled for various student and district characteristics, other unmeasured confounding variables might influence the observed grading disparities.

While this study's findings provide valuable insights into grading disparities in Arkansas, further research is necessary to confirm these results in broader contexts over extended periods. In conclusion, addressing grading disparities requires a concerted effort from educators, policymakers, and researchers alike. By implementing equitable grading practices and supporting teachers in this endeavor, we can pave the way for a more just and inclusive education landscape, regardless of regional locale.

6. Conclusion

This research has unveiled the complex interplay between SES, regional locales, and grading disparities among ninth-grade students in Arkansas, offering an understanding that challenges the prevailing

norms within educational assessment practices. By analyzing the data through both descriptive trends and logit analysis, this study not only highlights the disproportionate impact of traditional grading practices on economically disadvantaged students but also raises critical questions about the fairness and objectivity of these methods. The findings underscore a pressing need for educational stakeholders to re-evaluate and reform grading practices, ensuring they accurately reflect students' academic abilities and do not perpetuate existing inequalities. The study's implications extend beyond academic discourse, suggesting actionable pathways for educators and policymakers to foster a more equitable educational environment that genuinely supports all students' learning and development.

Future research, as I suggest, should aim to extend the scope of this investigation beyond Arkansas to examine whether these findings hold true in other educational contexts, both within the United States and internationally. Adopting a longitudinal design could provide deeper insights into the long-term effects of grading disparities on students' educational trajectories and socioeconomic mobility. Furthermore, engaging in qualitative research to capture the perspectives of educators and students could enrich our understanding of the lived experiences behind the data, offering a more holistic view of the challenges and opportunities in implementing equitable grading practices. As this study concludes, it is clear that addressing grading disparities is not just an academic exercise but a moral imperative to ensure that our educational systems serve as bridges, not barriers, to student success and equality.

Ethical Statement

This study does not contain any studies with human or animal subjects performed by the author.

Conflicts of Interest

The author declares that she has no conflicts of interest to this work.

Data Availability Statement

Data sharing is not applicable to this paper as no new data were created or analyzed in this study.

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