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# GED® College Readiness Benchmarks and Post-Secondary Success

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**Abstract**

In 2016, the GED® introduced college readiness benchmarks designed to identify testers who are academically prepared for credit-bearing college coursework. The benchmarks are promoted as awarding college credits or exempting "college-ready" GED® graduates from remedial coursework. I show descriptive evidence that those identified as college-ready by these benchmarks enroll and persist in college at significantly higher rates than others who pass the GED® exam, but at lower rates than recent graduates with traditional high school diplomas. Regression discontinuity estimates show that crossing a college readiness threshold does not substantially influence testers' college enrollment or persistence during the two years following their first test attempt. Relatedly, I observe little exam retaking by those who fall narrowly short of the minimum college readiness score thresholds. This contrasts strongly with retaking behavior near the lower GED® passing threshold that determines eligibility for a high school equivalency credential. Those who narrowly fail a GED® subject test are over 100 times more likely to retest than those who fall just short of a college readiness benchmark in the same subject. GED® college readiness benchmarks do not currently appear to promote better college outcomes, but in the absence of more detailed test score information they offer a simple heuristic to predict short-run college enrollment and persistence among GED® graduates, particularly for those who identify educational gain as a primary reason for testing. The results highlight the promise and challenges associated with building pathways for non-traditional students to earn credit for prior learning.

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## 1 Introduction

High school equivalency (HSE) credentials offer an alternative pathway for individuals who lack a traditional high school diploma to meet requirements for many jobs and training opportunities in the United States. The GED® is the oldest and most popular HSE examination in the United States, awarding passers with a credential that is generally accepted as meeting minimum high school graduation requirements that are a prerequisite for many jobs and nearly all post-secondary institutions nationwide. In 2014, GED Testing Service, LLC. (GEDTS) introduced the 5th edition of the GED® exam, transitioning to a predominantly computer-based format, increasing test rigor to align content with national College and Career Readiness Standards, and introducing the GED® Honors designation for testers who achieved a subject test score of 170 or higher. The 5th edition of the exam emphasized the GED® as a "stepping-stone toward a college classroom or a better career and a family sustaining wage," acknowledging the GED® exam's role as "no longer an endpoint for adults, but a springboard for more education, training, and better-paying jobs" (GEDTS, 2014b). In 2016, based on data from early cohorts who passed the revised exam, GEDTS adjusted the overall passing threshold for the exam's subject tests down from 150 to 145, and replaced GED® Honors with two new college readiness benchmarks: GED® College Ready and GED® College Ready Plus Credits for individuals who earned a minimum subject test score of 165 and 175, respectively (Gewertz, 2016).

The college readiness benchmarks were introduced alongside recommendations by the American Council on Education that students who reach a GED® College Ready score threshold in a subject be exempt from remedial coursework in that subject, and that those who reach a GED® College Ready Plus Credits score threshold be awarded credit for prior learning in the form of lower division college credits in that subject. These recommendations highlight the potential role of HSE credentials as an alternative pathway to post-secondary education, and added the GED® to an emerging marketplace of examinations, training programs, and credentials that offer the promise of credit for prior learning in a growing number of post-secondary institutions (Boatman et al., 2020; Klein-Collins et al., 2020; The ACE National Guide, 2021).

Using data from 1.2 million people who took a GED® subject test in the United States between 2014 and 2019, this study is the first to describe the modern "college-ready" population of GED® testers. This study is also the first to quasi-experimentally examine the causal impact of earning a GED® college readiness designation on educational outcomes, linking a random subsample of roughly 30,000 GED® testers to National Student Clearinghouse (NSC) college enrollment and degree records. This paper also contributes to the nascent causal literature examining the effectiveness of assessments that award college credit for prior learning.

On average, I find that "college-ready" GED® recipients enroll and persist in college at significantly higher rates than others who pass the GED® exam but at lower rates than recent graduates with traditional high school diplomas. Estimating impacts a regression discontinuity framework, I find that reaching college readiness benchmarks that are promoted as awarding college credits or exempting "college-ready" GED® recipients from remedial coursework do not appear to substantively influence testers' college enrollment or persistence behaviors. I test for heterogeneity in treatment effects by individuals' demographic characteristics, stated motivation for testing, and rates of American Council on Education (ACE)[1] membership among local post-secondary institutions, and I find no consistent evidence that any particular subgroups were differentially impacted by crossing a GED® college readiness benchmarks.

Relatedly, testers who fall narrowly short of reaching a GED® college readiness threshold exhibit strikingly different retesting behaviors than their peers who fall just short of reaching a minimum subject test *passing* threshold, which testers must meet or exceed to earn a high school equivalency credential. Those who narrowly fail a GED® subject test are over 100 times more likely to retest at least once than those who fall just short of earning a college readiness designation in the same subject. This suggests that while GED® testers who score near a subject test passing threshold place a high value on earning a credential, higher scoring testers either face constraints to retesting or do not expect similar returns to effort expended toward earning a college readiness designation.

The remainder of this paper is organized as follows: in Section 2, I decribe past research assessing the impact of earning a GED® credential. In Section 3, I provide background on high school equivalency exams in the United States. In Section 4, I describe the data sources and present key descriptive statistics for the sample. In Section 5, I present my empirical strategy and econometric models. I present the main results, heterogeneity analyses, and robustness checks in Section 6, and conclude in Section 7 with a discussion of the results and policy implications.

[1]The American Council on Education is a parent organization of GED Testing Service, LLC in a joint venture with Pearson, but ACE does not participate in the creation or production of the GED® exam. ACE issues recommendations on credit for prior learning to its member institutions based on third-party evaluations of credentialing and training programs, including the GED® exam.

## 2 Literature Review

Evidence from past thirty years of research on the impacts of the GED® on recipients is mixed, but no causal research examines recent cohorts of testers, the most recent edition of the exam, or the GED® college readiness designations. Early work comparing the educational and labor market outcomes of exam-certified high school equivalents and traditional high school graduates found that on average, individuals who earned HSE credentials in the 1980s substantially underperformed their peers with traditional high school diplomas in the labor market and educational attainment, even after conditioning on a measure of academic ability. Furthermore, while those with HSE credentials outperformed uncredentialed high school dropouts in the raw data, their outcomes were indistinguishable from uncredentialed dropouts after accounting for years of completed schooling (Cameron & Heckman, 1993).

Several studies, including Cameron and Heckman (1993), used the National Longitudinal Study of Youth (NLSY79), which follows a nationally representative sample of young people who were aged 14-22 in 1979 as they transitioned from adolesence to into adulthood, to compare the educational and labor market outcomes of GED® graduates to those of their peers with and without traditional high school diplomas. Studies examining NLSY79 data and other nationally representative longitudinal data sources like High School and Beyond have explored the relationship between GED® receipt and life outcomes for a variety of subgroups, including men (Murnane, Willett, & Boudett 1995), women (Boudett, Murnane, & Willett 2000), immigrants (Clark & Jaeger 2006), prisoners (Nuttall, Hollmen, & Staley 2003; Darolia, Mueser, & Cronin, 2021), and students with disabilities (Wagner et al., 2005). While some of these studies found positive changes in earnings trajectories or educational attainment following GED® receipt, particularly for individuals with lower measures of baseline academic skill, others found null results, with no clear consensus as to whether, or for whom, HSE credentials improve recipients' life outcomes (for a review, see Heckman, Humphries, & Mader, 2011 or Heckman, Humphries, & Kautz, 2014).

The earliest quasi-experimental work measuring the signaling value of earning a high school equivalency credential by passing the GED® focused on men's labor market outcomes and found large increases in wages for marginal GED® recipients who were white, but not for others in a sample from 45 states (Tyler, Murnane, & Willett, 2000). However, recent work examining the causal impact of HSE certification on educational and labor market outcomes calls into questions the internal validity of past quasi-experimental analyses that condition on final score (after endogenous retaking) rather than first-attempt GED® subject test scores to generate their estimates (including Tyler, Murnane, & Willett, 2000). Jepsen, Mueser, and Troske (2016, 2017) account for the endogeity of exam retaking to measure the impact of passing the GED® exam in Missouri using a regression discontinuity framework and find no evidence of lasting educational or labor market returns for marginal HSE credential recipients. Heller and Slungaard Mumma (2019) incorporate these methodological innovations to assess the role of the GED® in promoting educational attainment in Massachusetts and find that passing the GED® has large, positive effects on the college enrollment and persistence behaviors of public adult education students, but null effects for dropouts who do not participate in adult education.

Given that most studies of the GED®'s effects are based on distant cohorts and long-discontinued exams, the generalizability of these studies deserves careful consideration. If differences in exam format, rigor, K-12 schooling, or the larger social and economic context influence selection into the population of exam certified high school equivalents or the way such credentials are viewed and used in the labor market or higher education, it is uncertain how past evidence will generalize over time and space. Since the NLSY79 analyses, two additional HSE exams have come into use at the state and national level, and the GED® has been revised twice, transitioning to a computer-based format and introducing two college readiness benchmarks. Jepsen, Mueser, and Troske's (2016, 2017) evaluation relies upon data from Missouri cohorts who took the GED® exam between 2001 and 2005, straddling the third edition of the exam (discontinued in 2002) and the fourth edition (discontinued in 2013). Heller and Slungaard Mumma (2019) examine data from Massachusetts GED® testers who took the fourth edition of the exam between 2007 and 2013. Additionally, Jepsen, Mueser, and Troske's (2016) methodological innovations cast doubt upon the internal validity of causal estimates from the most recent attempt to examine the causal impacts of passing the GED® in a national sample (Tyler, Murnane, & Willett, 2000), which itself followed cohorts who took the exam over 30 years ago.

Historically, theorists have argued that taking and passing the GED® is a mixed signal, conveying higher levels of academic skill than the average dropout, but lower levels of non-academic skills than traditional high school graduates (Heckman & Rubinstein, 2001; Araujo, Gottlieb, & Moreira, 2007). However, it is unclear how higher levels of GED® certification are viewed by hiring managers, admissions officers, or testers themselves, nor how the national population of exam certified high school equivalents or the overall returns to HSE credentials have changed over the past 10 to 20 years.

## 3 High School Equivalency Exams in the United States

Over 24 million adults in the United States (nearly 10% of the adult population) do not have a high school diploma or equivalent credential (U.S. Department of Education, 2023). HSE credentials represent the primary "second-chance" pathway for these adults to meet minimum requirements for many jobs or educational opportunities. The GED® exam was the first HSE test in the United States, developed in 1942 to provide soldiers returning from World War II with an alternative pathway to finish their secondary education upon their return (GEDTS, 2017). However, demand for alternative credentials extended far beyond the military, and over 20 million people have earned an HSE credential by passing the GED® exam since its release (GEDTS, 2014a).[2]

The modern GED® exam comprises a battery of four timed subject tests covering high school-level content: Mathematical Reasoning, Reasoning Through Language Arts, Science, and Social Studies. Tests are designed to assess whether testers have developed content mastery and critical thinking skills that are equivalent to the academic skills required to earn a high school diploma. To pass the GED® exam, individuals must reach or exceed minimum score thresholds on each subject test.[3] Testers who score below the passing threshold on one or more subject tests may retake individual subject tests until they pass and combine their highest scores on each subject test to pass the exam. Rules regarding the timing (e.g., required "cool-down periods" between tests or caps on the number of subject test attempts in a year) and cost of retesting vary by state.

Introduced in 2016, the GED® College Ready (GED® CR) and College Ready plus credits (GED® CR+C) designations are awarded when a student's subject test score crosses higher thresholds: 165 for GED® CR and 175 for GED® CR+C. These subject-specific benchmarks are designed to identify students whose exam performance indicates that they are academically prepared to succeed in credit-bearing, college-level coursework in that subject. The levels of the GED® CR and CR+C benchmarks were set based on recommendations from the American Council on Education (ACE) that meeting a GED® CR benchmark "[...]enables the student to be waived from all developmental education requirements or courses and placement testing in that content area..." and that a student who reaches the GED® CR+C threshold in a given subject "[...]has demonstrated

[2] In their 2014 Annual Statistical Report on the GED® Test, GEDTS estimates that "[p]assers in 2013 join the approximately 20 million candidates who have passed the GED® test in its history," and GED.com advertised "over 20 million graduates and counting" on its homepage in March, 2021.

[3] Past editions of the GED® also required testers to reach a minimum total score summing over all subject test scores, in addition to meeting minumum subtest thresholds. The minimum total score exceeded the sum of the minimum subject test passing thresholds, requiring testers to achieve an average subtest score slightly higher than the minimum passing score for any given subtest to earn a credential.

skills reflective of the appropriate content, scope, and rigor for college credit recommendations" (The ACE National Guide, 2021). GEDTS estimates that reaching a GED® CR benchmark is roughly equivalent to scoring in the top quartile of the general U.S. population of graduating high school seniors in that subject, and that in each subject, less than 10% of graduating high school seniors would reach the GED® CR+C score threshold (GEDTS, 2016).

For decades, passing the GED® was the only widely recognized path to earn an HSE credential in the United States, however in recent years two alternative HSE exams have emerged. The TASC and HiSET exams were developed in 2013 by Data Recognition Corporation (TASC) and ETS (HiSET) in response to the changes introduced with the fifth edition of the GED. In 2014, when the GED® released the 5th edition of the exam, transitioning to an exclusively computer-based format, increasing test rigor to align with national College and Career Readiness Standards, and increasing test fees by an average of roughly 70%, some states responded to these changes by seeking out alternative assessments (Auslen, 2013). TASC replaced the GED® in both Indiana and New York state ("Move over G.E.D.", 2013), and several states (including Montana, New Hampshire, Massachusetts, Missouri, and Tennessee) adopted the HiSET as their preferred HSE exam (Auslen, 2013). Since 2014, twenty-six states have decided to supplement or replace the GED® by offering and accepting one or both of HiSET and TASC as alternative HSE examinations (Data Recognition Corporation, 2020; ETS, 2020b). During some or all of the study period, forty states and the District of Columbia continued to administer the GED® exam as an HSE pathway, while ten states did not. Today, forty-eight states and the District of Columbia officially administer the GED® exam, with only Iowa and Maine relying exclusively on alterantive HSE assessments. However, nearly all employers and post-secondary institutions nationwide recognize passing the GED® exam as satisfactory to meet a high school diploma requirement (GED Testing Service, 2020a, 2020b). The GED® is the only national HSE exam that awards explicit college readiness designations, and the only HSE exam with recommendations in The ACE National Guide for using scores in remedial course placement or credit award decisions (The ACE National Guide, 2021). However, HiSET score reports note that testers who reach a qualifying score on any subtest (15 out of 20, versus the minimum subtest passing score of 8 out of 20) have "demonstrated college and career readiness" and "[. . . ] should be able to enroll in credit-bearing course work in the university level" (ETS, 2020a), while the TASC does not provide any equivalent college-readiness benchmarks.

# 4 Data and Descriptive Statistics

Data for this analysis comes from GEDTS, which maintains a database of all test attempts by individuals who take any GED® subject test. Data for this project is limited to subject test attempts completed between January 1, 2014 and December 31, 2019 anywhere in the United States. The final data set comprises 5.34 million subject test scores from 1.26 million unique individuals. During test administration, GEDTS collects a rich set of information from testers about their demographics, test-preparation strategies, primary reason for pursuing a GED® credential, primary reason for not completing a traditional high school diploma, and labor force status. This data is linked to subject test scores for all testers who provided such information.

Each year, GEDTS contracted with National Student Clearinghouse (NSC) to link a random sample of individuals who earned an HSE credential by passing the GED® exam (so-called "GED® graduates") at least one year prior to college enrollment data and updates records for previously matched cohorts. Between 2014 and 2020, 31,959 GED® graduates' records were linked to NSC's college enrollment database. For all analyses, I restrict the sample to individuals who first attempted a GED® subject test after the announcement of the GED® CR and GED® CR+C benchmarks on January 26, 2016 and who took the exam in English outside of a correctional facility. Implementing these sample restrictions yields an analysis sample of 644,615 unique testers, with 15,262 linked to NSC college outcome data.

Table 1 reports summary statistics for the full sample of GED® testers as well as those that form the analytic samples. Column (1) summarizes the characteristics of all GED® testers in the United States between 2014 and 2019, and Column (2) summarizes the same characteristics for the full analytic sample after implementing the sample restrictions described above. Column (3) summarizes the characteristics of the population of GED® recipients in the full analytic sample who were randomly sampled to be matched to NSC's college enrollment database.[4] Column (4) summarizes the characteristics of the random sample of GED® recipients from the analytic sample whose records were sent to National Student Clearinghouse (the matched analytic sample). Column (5) tests whether the samples in Columns (3) and (4) are statistically distinguishable along the observable dimensions considered in the analysis. Columns (6) and (7) summarize the char-

[4] Note that this is not the full population of individuals in the analytic sample who passed the GED® exam. In 2018, only GED® graduates who met the original 5th edition GED® subject test passing score threshold (150) in all subjects were sampled for NSC matching (including those who initially scored below 150 in one or more subjects, but exceeded that threshold after retesting).

acteristics of all GED® testers in the full analytic sample who earned a GED® College Ready or GED® College Ready Plus Credits designation in any subject. Appendix Table 1 reports counts of GED® testers, completers, and passers by year.

### 4.1 The GED® College Ready Population

The GED® CR and GED® CR+C benchmarks identify a high-performing subset of GED® testers. To earn a GED® CR designation a given subject over the period I consider, an individual had to score in the top 7%-16% of all GED® testers in that subject, and only the top 2%-4% earned a GED® CR+C designation in a given subject. Out of 644,615 individuals in the full analytic sample, 144,228 (22%) qualified as GED® CR in any subject, and 38,995 (6%) earned a GED® CR+C designation in any subject. Appendix Table 2 reports the proportion of the analytic sample who reached the minimum scores to qualify for GED® CR and GED® CR+C designations on each subject test, and Appendix Table 3 reports the number of individuals who achieved GED® CR, GED® CR+C, or GED® Honors by subject and year. Columns (6) and (7) of Table 1 show that GED® CR and GED® CR+C designees are more likely to cite education as their primary motivation for testing, pay for test preparation, prepare using online resources, study independently, or be homeschooled, and less likely to be female, Black, Hispanic, attend adult education classes, or study for the exam than the general population who take or pass the exam.

Figures 1a-1d show the distribution of subject test scores by an individual's category of GED® performance in all other subjects, plotting separate distributions for testers (a) who failed at least one other subject test, (b) passed all other subject tests without earning a GED® CR or CR+C designation in any other subject, (c) earned a GED® CR designation in at least one other subject, and (d) who earned a GED® CR+C designation in at least one other subject. The distribution of test scores will be mechanically higher for GED® CR and GED® CR+C testers in their CR or CR+C subject, but not other subjects. Since Figures 1a-1d define each college ready population leaving out their score in that subject[5], the rightward shift at each level of GED® performance shows that testers who achieve GED® CR and GED® CR+C designations score higher in all subjects. On average, college readiness in one content area predicts general knowledge as measured by performance on other GED® subject tests.

Figure 2a reports rates of college enrollment and persistence for GED® CR and GED® CR+C

[5]E.g., a tester's classification in Figure 1a, which plots the distribution of Mathematical Reasoning subject test scores, is based on her performance on the Reasoning through Language Arts, Science, and Social Studies subject tests only.

graduates compared with GED® graduates who do not qualify for a college readiness designation and a non-representative, national sample of 1.4 million 2016 high school graduates from National Student Clearinghouse (NSCRC, 2019). Overall, 30.4% of GED® graduates were observed as enrolled in a post-secondary institution for at least one quarter. However, this rate falls to 26.3% for those who did not reach any GED® CR benchmark, rising to 34.1% for those who did, and 41.0% for GED® graduates who reached the GED® CR+C score threshold in at least one subject. While GED® CR and GED® CR+C testers are drawn from the right tail of test score distribution, their rates of college going still lag behind the average traditional high school graduate in the NSC sample. This holds true if we restrict the comparison sample to graduates of traditional public schools, public charter schools, or private schools, and even if we limit the comparison sample to graduates of traditional public schools NSC defines as "Low-Income", where at least 50% of students are free and reduced-price lunch eligibile (NSCRC, 2019). Similarly, conditional on enrolling within one year of passing the exam, Figure 2a shows that GED® CR and GED® CR+C are more likely to re-enroll than their peers who pass the GED® but do not earn a college readiness designation, but still lag behind the comparison sample of traditional high school graduates in their rates of persistence from year one to year two of college.

Some GED® testers take the exam because of a desire to leave school, while others may view the exam as a pathway back into formal education. If I limit the sample to GED® gradutes who cite "educational gain" as their primary reason for testing, rates of college-going rise for all groups by roughly 30% and rates of persistence increase only slightly, but the basic patterns remain: college outcomes increase by GED® college readiness category, but group means stay below the average traditional HS graduate in the comparison sample, even for GED® CR+C designees.

Similarly, we might expect to find differences in college outcomes by GED® CR or GED® CR+C content area, e.g., since subject tests assess different dimensions of skill and could correlate with college major or coursetaking choices that vary in their completion rates and expected wage returns. Splitting out GED® CR scores by subject reveals a slight enrollment advantage for those who earn a GED® CR or GED® CR+C designation in Mathematical Reasoning versus other subjects, but no differences in rates of persistence by subject within the GED® CR or GED® CR+C categories. In all subjects, a GED® college readiness designation predicts higher rates of college enrollment and persistence relative to individuals who do not achieve that level of college readiness designation in any subject, but lower rates of enrollment or persistence than the average traditional HS graduate in the NSC comparison sample.

# 5 Empirical Strategy

## 5.1 Regression Discontinuity Analysis

To examine the impact of earning a GED® CR or GED® CR+C designation in a given subject, I use a regression discontinuity framework to predict college outcomes and retaking behavior of individuals at the GED® CR and GED® CR+C qualifying thresholds from above and below these thresholds for each subject, interpreting the difference in predictions as the causal impact of crossing a given college readiness threshold. To estimate returns to different categories of GED® performance, I construct regression discontinuity estimators that identify Intent-to-Treat (ITT) and Local Average Treatment Effect (LATE) estimates of the impacts of achieving a GED® CR or GED® CR+C designation in each subject. I cannot assess the impact of earning such a designation on outcomes by simply comparing the outcomes of those who earn a college readiness designation to those who do not, because these estimates would be confounded by unobserved dimensions of academic and non-academic skills that are correlated with an individual's subject test score and GED® CR or GED® CR+C classification.

The RD design leverages quasi-random variation in the distance of an individual's first score on a given subject test relative to the precise location of a qualifying score threshold to identify the impact of earning a GED® CR or GED® CR+C designation in that subject. The impact of earning a GED® CR or CR+C designation is estimated by comparing the difference in the predicted outcomes for individuals at each college readiness threshold from above and below those thresholds for each subject test based on the score they earn on their first attempt of a given subject test.

For the RD estimates to accurately measure the impact of earning a GED® CR or GED® CR+C designation on our outcomes of interest, it must be true that individuals cannot systematically manipulate the location of their subject test score relative to the qualifying threshold and that any underlying difference in the probability of earning a college readiness designation in the neighborhood of the qualifying threshold is captured by the smooth polynomial trends on GED® subject test scale scores on either side of the threshold, with the remaining variation uncorrelated with unmeasured ability. Additionally, any differences in predicted college outcomes from above and below the college readiness threshold must be explained only by the difference in probability of earning a college readiness designation that is caused by the location of an individual's subject test score relative to the qualifying threshold, net of error and the smooth polynomial trends on either side of the threshold.

Following Jepsen, Mueser, and Troske (2016, 2017), I use an individual's first attempt on each GED® subject test as the running variable to generate regression discontinuity estimates of the impact of attaining GED® college readiness designations on college outcomes and exam retaking. Using the test-taker's first score (as opposed to final score) addresses concerns about endogenous retesting behavior that could bias regression discontinuity estimates (Jepsen, Mueser, & Troske, 2016, 2017). While the qualifying thresholds are common knowledge, testers are unable to systematically manipulate their scores to reach the passing, GED® CR, or GED® CR+C thresholds on any particular attempt as the mapping of raw scores to scaled scores is unknown to testers and individuals only learn their scaled score after completing a subject test. Since sufficiently motivated and talented individuals may retake subject tests until they achieve a desired score, I exclude all subject test attempts after an individual's first attempt from the analysis.

I estimate the first-stage impact of reaching the minimum qualifying threshold on one's first attempt for each GED® college readiness threshold in each subject. At the GED® CR threshold for subject $j$, this can be modeled as:

$$\begin{aligned} CR_{ij} = \alpha_0 + \alpha_{1j} AboveCR_{ij} + \sum_{d=1}^{D} \alpha_{bjd}[BelowCR_{ij}(Score_{ij} - 165)]^d + \\ \sum_{d=1}^{D} \alpha_{ajd}[AboveCR_{ij}(Score_{ij} - 165)]^d + \alpha_{2j}X_i + \theta_t + \psi_s + v_{ijts} \end{aligned} \tag{1}$$

Where $AboveCR_{ij}$ and $BelowCR_{ij}$ respectively indicate whether individual $i$ scored above or below the GED® CR qualifying threshold on subject test $j$. Interacting each with an individual's distance from that threshold ($Score_{ij} - 165$) for subject $j$ allows the slope of the relationship between earning a GED® CR designation in a given subject and that GED® subject test score to vary on either side of the qualifying threshold (i.e., $\alpha_{ajd}$ versus $\alpha_{bjd}$). $X_i$ is a vector of covariates including age at first HSE attempt, an indicator for gender, and mutually exclusive and exhaustive sets of indicators for race/ethnicity as well as status in the labor force. $\theta_t$ represents a set of fixed effects for the year and quarter an individual first attempted a GED® subject test, and $\psi_s$ is a set of fixed effects for state of residence. The coefficient $\alpha_{1j}$ identifies the discontinuity in the probability individuals eventually earn a GED® CR designation in subject $j$ at the qualifying threshold. In my preferred specification, I set $D = 1$ to control for linear trends above and below the threshold, choose optimal bandwidths using the methods outlined in Calonico et al. (2019), and weight observations using a triangular kernel.[6]

Similarly, we can model the relationship between our college outcomes of interest and GED® subject test score at the threshold using the same model, but replacing the dependent variable with each outcome of interest, $Y_i$:

$$\begin{aligned} Y_i = \beta_0 + \beta_{1j} AboveCR_{ij} + \sum_{d=1}^{D} \beta_{bjd}[BelowCR_{ij}(Score_{ij} - 165)]^d + \\ \sum_{d=1}^{D} \beta_{ajd}[AboveCR_{ij}(Score_{ij} - 165)]^d + \beta_{2j} X_i + \theta_t + \psi_s + \epsilon_{ijts} \end{aligned} \tag{2}$$

The coefficient $\beta_{1j}$ can be thought of as an "intent to treat" estimate of crossing the GED® CR threshold on one's first attempt of a given subject test on outcomes of interest. The Wald estimator, $\tau_j$, which estimates the impact of actually earning a GED® CR designation on college outcomes is the ratio of $\beta_{1j}$ to $\alpha_{1j}$

$$\tau_j = \frac{\beta_{1j}}{\alpha_{1j}} \tag{3}$$

We can reformulate the fuzzy RD specification in an instrumental variables (IV) framework (Hahn, Todd, & Van der Klaauw, 2001; Imbens & Lemieux, 2008). To generate two-stage least squares (2SLS) estimates of the impact of earning a GED® CR designation on college outcomes, I estimate the predicted value of $CR_{ij}$ from equation (1) and use this predicted value to estimate equation (4) below for each subject test $j$. Once $\widehat{CR_{ij}}$ is estimated from the predicted values in equation (1), we estimate the causal impact of earning a GED® CR designation on college outcomes from:

$$\begin{aligned} Y_i = \gamma_0 + \gamma_{1j} \widehat{CR_{ij}} + \sum_{d=1}^{D} \gamma_{bjd}[BelowCR_{ij}(Score_{ij} - 165)]^d + \\ \sum_{d=1}^{D} \gamma_{ajd}[AboveCR_{ij}(Score_{ij} - 165)]^d + \gamma_{2j} X_i + \theta_t + \psi_s + e_{ijts} \end{aligned} \tag{4}$$

Importantly, all independent variables other than the predicted value $\widehat{CR_{ij}}$ enter the first and

[6] See section 6.4 below for a discussion of sensitivity to these and other modeling parameters.

second stage of the 2SLS regression exactly as in equations (1) and (2), so the coefficient $\tau_j$ from equation (3) is numerically identical to $\gamma_{1j}$ in equation (4), identifying the local impact of earning a college readiness designation in subject test $j$. Note that as the first-stage coefficent, $\alpha_{1j} \rightarrow 1$, the ITT and LATE estimates will converge, $\tau_j \rightarrow \beta_{1j}$.

This framework can easily be adapted to estimate the local impact of crossing the GED® CR+C or overall passing threshold rather than the GED® CR threshold by (a) replacing $CR_{ij}$ in equations (1) and (4) with a variable $CR + C_{ij}$ or $PassEver_{ij}$ that respectively measure whether individual $i$ ever crosses the GED® CR+C qualifying threshold in subject $j$ or earns a GED® credential; and (b) updating $(Score_{ij} - 165)$ in equations (1), (2), and (4) to match the relevant qualifying threshold [$(Score_{ij} - 175)$ for GED® CR+C, and $(Score_{ij} - 145)$ for the passing the GED® exam]. I consider impacts on college outcomes and exam retaking using each of the subject tests and college readiness designations (i.e., estimated at the GED® CR and GED® CR+C thresholds for each of the four subject tests).

Similarly, if we replace the outcome variable $Y_i$ with elements from the vector of baseline covariates $X_i$, we can use equation (2) to test for the baseline equivalence of predicted observable characteristics from either side of the GED® CR and GED® CR+C thresholds:

$$X_i = \lambda_0 + \lambda_{1j} AboveCR_{ij} + \sum_{d=1}^{D} \lambda_{bjd}[BelowCR_{ij}(Score_{ij} - 165)]^d + \sum_{d=1}^{D} \lambda_{ajd}[AboveCR_{ij}(Score_{ij} - 165)]^d + \lambda_{2j} X_i + \theta_t + \psi_s + \in_{ijts} \quad (5)$$

This functions like a balance test in a randomized trial, assessing whether the RD model identifies unexpected discontinuities in observable characteristics that should vary smoothly through the GED® CR and GED® CR+C thresholds. Results of this balance test at the GED® CR and GED® CR+C thresholds in each subject test are presented in Table 2. Across 424 tests (testing for discontinuities in 53 characteristics at 2 CR thresholds in each of 4 subjects), I find 38 significant differences at the 10% level, and 15 significant differences at the 5% level, close to what one would expect by random chance if observable characteristics were, in fact, distributed smoothly through the thresholds.

# 6 Main Results

## 6.1 First-Stages

Panel A of Table 3 presents first-stage estimates of the relationship between an individual's first GED® subject test score in a given subject and their eventual GED® CR or GED® CR+C attainment in that subject. Unlike the overall passing threshold, where predicted rates of exam passing are only 4% to 19% higher from above versus below each subject test passing threshold, Panel A of Table 3 shows that an individual's first attempt score almost perfectly predicts whether they ever qualify as GED® CR or GED® CR+C in that subject.[7]

This is explained by the large differences, shown in Panel D of Table 3, in rates of exam retaking at the passing threshold, but not at the GED® CR or GED® CR+C thresholds, where impacts on retaking are close to zero, as I will discuss in section 6.3 below. Because the first stage estimates for GED® college readiness in a given subject are practically (and in most cases, statistically) indistinguishable from one, I will treat this RD analysis as a sharp RD and report ITT estimates from equation (2) as the main results rather than LATE estimates from equation (4) that rescale the estimated discontinuity by the difference in rates of eventual GED® CR and GED® CR+C qualification. The subject-specific LATE estimates are qualitatively and statistically indistinguishable from the corresponding ITT estimates in all cases.

However, if one conceives of the GED® college readiness designations as functioning as a general signal of academic preparedness and not primarily as a subject-specific signal or path out of non-credit bearing remedial coursework in that subject, we can reformulate the first stage equation with a measure of college readiness in *any* subject as the dependent variable (i.e., replace $CR_{ij}$ with $CR_i = max(CR_{ij}, j \in \{Math, ELA, Sci, SS\})$ in equations (1) and (4). In this case, the first stage impact of crossing any particular subject test college readiness threshold ranges from 24% to 60%, implying that depending on the specific threshold in question, the LATE estimates will be about 1.6 to 4 times larger than ITT estimates in their absolute value.[8]

[7] See Panel A of Appendix Table 8 for first-stage estimates of differences in ever passing the GED® exam at each subject test threshold.

[8] See Appendix Table 9 for LATE estimates using this model that correspond to the main ITT estimates in Table 4, which are discussed in Section 6.2.

### 6.2 College Outcomes

Table 4 presents RD estimates estimated from equation (2) of the impact of crossing each subject's GED® CR and GED® CR+C thresholds on measures of college enrollment and persistence. Figures 3a-3h (Enrollment) and 4a-4h (Persistence) provide a graphical representation of these results. Table 5 presents estimates of the impact of crossing these college readiness thresholds on enrollment in each of the first 8 quarters following an individual's first GED® subject test attempt in any subject. Each subject test presents an opportunity for individuals to achieve a GED® CR or GED® CR+C designation in that subject, and the RD estimates reported in Tables 4 and Table 5 represent local impact of earning a GED® CR or GED® CR+C designation in a given subject using data from testers whose first attempt subject test score is in the neighborhood of the minimum CR or CR+C score to predict college outcomes from above and below the qualifying threshold.

I find no consistent evidence that crossing the GED® CR or GED® CR+C threshold and earning a GED® college readiness designation influences individuals' short-term college enrollment or persistence behavior. Out of the 80 estimates I consider in Tables 4 and 5 (for 10 outcomes at 2 college readiness thresholds over 4 subject tests), 5 are statistically distinguishable from zero at the 10% level and just over half (55%) of point estimates are positive, close to what one would expect by random chance in the case of truly null effects. While this analysis is underpowered to detect small effects ($\beta_{1j} < 10\%$), we can confidently rule out moderately sized or large effects of the GED® college readiness designations on college outcomes for the marginally qualifying tester. The only point estimates that are consistently distinguishable from zero suggest a *negative* effect of GED® CR+C qualification in Social Studies on both college enrollment and persistence. The following sections explore explanations for the overall pattern of null results, examining subject test retaking behavior and exploring potential heterogeneity in impacts.

### 6.3 Subject test retaking

Considering exam retaking as an outcome allows me to contrast the behavioral impacts of crossing the GED® CR and GED® CR+C thresholds with the impacts of crossing the overall passing threshold ($\geq$ 145 during the period I consider) on the probability that an individual retakes a given subject test. Using subject test scores in Mathematical Reasoning as the running variable, Figures 5a-5c show the striking contrast in the change in rates of retesting at the the overall passing threshold (Figure 5a) versus the GED® CR (Figure 5b) or GED® CR+C thresholds (Figure 5c).

Other subject tests exhibit the same pattern (see Appendix Figures 3a-3i).

Among GED® testers who narrowly fail a given subject test by scoring within three points of passing on their first attempt, 70% to 80% retest at least once in that subject, while nearly no one retakes a subject test they narrowly pass. This corresponds to the point estimates in the first row in Panel D of Table 3, where RD estimates predict marginal passers to be 72 to 81 percentage points less likely to retake a subject test than their peers who fall just short of passing. Strikingly, the remaining point estimates in panels C and D of Table 3 are very close to zero, as less than 0.5% of testers who fall narrowly short of reaching a GED® CR or GED® CR+C threshold on any subject test retest in that subject. This suggests that while lower-performing GED® testers in a given subject are willing and able to exert substantial effort to ensure they earn a credential, higher performers either are not willing to exert effort to ensure they earn a GED® CR or GED® CR+C designation or face administrative obstacles to retesting. Indeed, while testers who fail a subject test may retake that test—generally free of cost—those who pass a subject test but want to improve their score to reach a college readiness benchmark must pay an additional retesting fee (though this fee may be discounted), and in some states or localities, they may be discouraged or disallowed from retaking a subject test they have previously passed.[9] In the absence of such obstacles, retesting behavior is consistent with GED® testers placing a high value on earning a credential, but not expecting similar returns to effort expended toward earning a college readiness designation.

### 6.4 Heterogeneity

I examine four pathways that could lead to heterogeneity in treatment effects. First, I explore whether treatment effects vary by subject or the point in the overall skill distribution where a particular GED® CR or GED® CR+C qualifying threshold is located. Second, I examine treatment effect heterogeneity in demographic subgroups that are commonly collected in administrative datasets, covering gender, race, and baseline employment status. Next, I examine whether a tester's stated primary reason for taking the exam predicts the effect of crossing a college readiness threshold. Finally, as a proxy for differences in rates of institutional take up, I construct a measure of the intensity of ACE membership of local post-secondary institutions at the state level and estimate impacts separately for testers in high versus low ACE membership states.

[9] Costs of retesting and official subject test retaking rules vary by state. However, among individuals who passed a given subject test on their first attempt, I do observe some subject test retaking in raw subject test score data between 2016 and 2019 in each state that offers the GED® exam.

### 6.4.1 Subject, Skill Level, and Benefits

By estimating treatment effects separately at both college readiness thresholds for each the four subject-tests separately the main results in Table 4 allow me to explore two dimensions of heterogeneity in treatment effects. First, each subject test confers a GED® CR or GED® CR+C in that subject, and earning a college readiness designation in one subject may affect individuals differently than in another. For example, twice as many students at two-year colleges are assigned to remedial coursework in math (nearly 60%) than are required to complete remedial coursework related to English or reading, and students are more likely to fail to complete a remedial course sequence in math than any other subject (Chen, 2016; Kozakowski, 2019). This could mean that the ACE recommendation that individuals who earn a GED® CR designation in Mathematical Reasoning be granted a waiver from developmental coursework in math makes that GED® CR designation more consequential than earning a GED® CR designation in other subjects. Furthermore, ACE recommendations for the number of lower-division credits institutions award to students who earn a GED® CR+C designation varies by subject, suggesting that institutions award only one credit in English for students who qualify as GED® CR+C in Reasoning Through Language Arts but three credits in math, science, or social studies for reaching the corresponding GED ® CR+C thresholds. However, I do not find any systematic differences in treatment effects by GED® CR or GED® CR+C subject. The only consistently statistically significant estimates are negative impacts of crossing the GED® CR+C Social Studies threshold on college outcomes. While it is possible that earning a GED® CR+C designation in social studies discourages recipients from enrolling or persisting in college, there are no similar effects in any other subject test threhold or at the GED® CR threshold in social studies. Additionally, these significant coefficients are not robust to standard corrections that account for multiple hypothesis tests (Bonferroni, 1935; Holm, 1979).

Additionally, the GED® CR and GED® CR+C score thresholds are binding at different parts of the score distribution for each subject test. For example, the marginal tester who earned a GED® CR designation in Math scored in the 93rd percentile, while the marginal tester who earned a GED® CR designation in Social Studies only scored in the 84th percentile. There is much less variation in the precise location of the GED® CR+C qualifying threshold, where testers had to score in roughly the 98th percentile in Math, ELA, or Science, and the 96th percentile in Social Studies to qualify. Examining the effects of crossing the GED® CR thresholds in each subject does not suggest a strong link between the location of a subject's qualifying threshold in the overall score distribution and the estimated impact of earning a college readiness designation in that subject, with the correlation between percentile rank at a subject test CR or CR+C threshold and the estimated impact of crossing that threshold ranging from -0.76 for impacts on persistance at the GED® CR thresholds to +0.91 for impacts on enrollment at the GED® CR+C thresholds.

Finally, the qualifying thresholds for the different categories of college readiness themselves—GED® CR versus GED® CR+C—both (a) affect testers at different parts of the overall score distribution and (b) come with different ACE recommendations for how institutions should interpret and use that college readiness designation. If the primary benefit of earning a college readiness designation is the exemption from remedial coursework, then we might expect the GED® CR benchmarks to have larger effects, because they identify a slightly lower-performing (albeit still high-performing) subset of GED® graduates who may be less likely to pass out of remedial coursework in the absence of earning a GED® CR designation. However, if the primary benefit is earning credits for prior learning, which is exclusive to the GED® CR+C designation, we might expect crossing the GED® CR+C threshold to yield larger benefits. In practice, I find that there is no consistently positive or negative relationship between crossing the GED® CR or GED® CR+C thresholds.

### 6.4.2 Demographic Subgroups

In columns (1) through (4) of Tables 6a and 6b, I divide the sample into demographic subgroups based on gender and under-represented minority identity. If individuals from under-represented groups are less likely to view themselves as "college ready" or more likely to experience self doubt or imposter syndrome, then receiving a positive, private signal of their ability or academic preparedness could motivate these individuals to enroll in college or persist once enrolled. Contrary to this prediction, I find no consistent differences in the impact of reaching a GED® CR or GED® CR+C threshold by gender or membership in an under-represented minority group. Taken at face-value, the point estimates suggest that earning a GED ® CR+C designation in Science may be more impactful for women and under-represented minorities, both groups that are under-represented in STEM fields, but the confidence intervals are large, and a similar advantage does not appear consistently in Math or at the GED ® CR threshold.

### 6.4.3 Motivation for Testing

In columns (7) and (8) of Tables 6a and 6b, I divide the sample into demographic subgroups based on a tester's stated primary reason for taking the GED, comparing those who identify Educational

Gain as a primary reason versus all other reasons (Personal, Military, Work, Special Requirement). Comparing group means in Figures 2b and 2c reveals substantial differences in rates of college enrollment across all categories of college readiness by reason for testing (Education vs. any other reason). Since individuals who are motivated by educational gain appear to drive college enrollment among GED graduates, they may be more likely to seek out ways to use GED® CR or GED® CR+C benefits, while individuals who identify other reasons for testing may be unlikely or unable to enroll in college as they pursue other goals. Conversely, if individuals who are motivated by educational gain are more committed to enrolling in college, they may have higher rates of enrollment regardless of GED® CR qualification, and individuals who took the exam for other reasons may be more sensitive to unexpectedly learning that they qualify for GED® CR or GED® CR+C benefits that could make college appear more accessible or less costly. Despite the large differences in rates of college enrollment by reason for testing in Figure 2, the GED® CR designations do not appear to exert systematically different impacts on college outcomes for testers whose primary reason for testing is educational gain versus other reasons.

#### 6.4.4 ACE Membership

Finally, I use the prevalence of ACE membership in a state as a proxy for the likelihood a qualifying tester could find a local institution that had adopted ACE recommendations for the GED® college readiness benchmarks regarding credit for prior learning. In columns (5) and (6) of Tables 6a and 6b, I split the sample by whether the state where an individual took their first GED® subject test is above or below the median of a measure of ACE membership intensity.

To construct my index of ACE membership intensity, I measure the proportion of the college-aged population in a GED® tester's state that is enrolled in ACE institutions and the proportion of post-secondary enrollment in that state that occurs in ACE member institutions. I standardize each measure to have a mean of zero and standard deviation of one, and sum these standardized components to form an index of ACE membership intensity. ACE is a partner in the publication of the GED® exam and issues recommendations about how to interpret and use GED® CR and GED® CR+C qualifications. If member institutions are more likely to accept or use these qualifications in thier remediation or credit award decisions, then testers in states with relatively more ACE membership may be able to more easily access benefits for earning a GED® CR or GED® CR+C designation.

While I do find a handful of point estimates are statistically distinguishable from zero and, in three cases, from their complement, there is no consistent pattern in the direction or subject in which impacts vary by ACE membership intensity.

## 6.5 Robustness Checks

### 6.5.1 Alternative Models

Appendix Tables 4, 5, and 6 present alternative RD estimates of the impact of crossing GED® CR and GED® CR+C thresholds on college outcomes, respectively using alternative local polynomial trends, adding alternative sets of covariates (including no covariates), and using the robust and bias-corrected local-polynomial methods described in Calonico et al. (2019).

Another important consideration in RD analyses is the choice of bandwidth for the analysis sample. For the main analyses and balance tests, I calculate and use optimal bandwidths using the methods described in Calonico et al. (2019). In Appendix Figures 2a and 2b and Appendix Tables 7a and 7b, I present alternative RD estimates for all analyses in Table 4 using all possible bandwidths between 2 to 9 points[10] in addition to the Calonico et al. (2019) optimal bandwidths that are used in the main analysis.

With the exception of RD estimates at the GED® CR+C Social Studies threshold, nearly every choice of bandwidth, covariates, degree of polynomial trend, and bias-correction yields null estimates of treatment effects for both college outcomes in all subjects. The largest bandwidths suggest negative effects on college persistence from crossing the GED® CR+C Mathematical Reasoning threshold and higher order polynomials yield large negative effects from crossing the GED® CR+C threshold in Science. Notably, no modeling decision yields positive, statistically significant estimates in any subject, threshold, or outcome.

### 6.5.2 Density Checks

Appendix Figures 1a-1d plot the density of observations at each point of the discrete subject test score distribution within 5 points of either college readiness threshold. Each figure is labeled with the p-values from tests of score manipulation at each threshold.[11] While the tests, which measure the smoothness of the subject test score density function at the qualifying threshold, sometimes

[10] This range represents all possible symmetric integer bandwidths that can be used without encountering potential non-linearities caused by marginal eligibility for the other GED® college readiness designation.

[11] I use a test developed by Frandsen (2017) that builds on the methods described by McCrary (2008) to develop correctly-sized tests for smoothness of the density function in regression discontinuity analyses that use a discrete running variable.

reject the null hypothesis that the distribution is smooth, in all cases where the test rejects the null hypothesis of a smooth distribution, the change in density at the threshold runs counter to the expected change in densities that would be caused by intentional manipulation. In these cases, the density of observations *falls* at the college readiness threshold rather than rising, which would be the expected effect if individuals manipulating their score placement to qualify for a given GED® CR or GED® CR+C designation. As such, I interpret the density plots and tests as showing no evidence of score manipulation, but hypothesize that the bunching observed near some subject test score thresholds are psychometric artifacts that arise from the coarseness of the mapping from raw scores to scale scores, especially toward the tails of the test score distributions where the GED® CR and GED® CR+C thresholds are located.

# 7 Discussion

The introduction of the GED® CR and CR+C college readiness designations foreshadowed a future where the GED® expanded its role as an alternative pathway to post-secondary education for college-ready testers, helping this group of high-achieving HSE credential holders learn and signal their ability, avoid costly remediation, and potentially earn transferable college credits. Four years later, I find that while testers who earned GED® CR and GED® CR+C designations enrolled and persisted in college at higher rates than other GED® graduates, rates of college enrollment and persistence for GED® CR and GED® CR+C testers were indistinguishable from that of GED® testers who fell narrowly short of qualifying for these designations. Currently, the GED® college readiness benchmarks predict—but do not cause—better college outcomes.

There are many potential explanations for the null effects of the college readiness designations on college outcomes.[12] First, waivers from developmental coursework, a primary benefit afforded to testers who earn GED® CR and GED® CR+C designations at institutions that follow ACE recommendations, may be of little practical value for this population. The GED® CR and GED® CR+C benchmarks are difficult to attain, representing the 86th-98th percentiles of the GED® subject test score distributions. Testers who score near a college readiness threshold in a given subject test may already be likely to pass out of remediation on placement exams like the Accuplacer in that subject, substantially reducing the utility of a waiver from developmental education or

[12] In addition to the explanations discussed below, one limitation of this study's analysis of college outcomes is statistical power, as I was only able to attempt to match $< 5\%$ of GED graduates from 2016-2019 to college enrollment records. Matching a larger set of GED testers, including those who never pass the exam, would improve the precision of the estimated effects and open new lines of research.

placement exams.[13]

Similarly, the high bar to qualify means that testers who earn GED® CR and GED® CR+C designations may be less sensitive to receiving a positive private signal of academic preparedness. While, such a signal could motivate or instill confidence in individuals whose skills are truly on the margin of academic preparedness, the GED® CR and GED® CR+C thresholds may be sufficiently high in the score distribution that marginally qualifying testers believe they are ready for college with or without the additional signal provided by a GED® CR designation.

Finally, low rates of institutional takeup and informational constraints may limit the ability of students to find institutions where they can use their GED® CR and GED® CR+C benefits, further muting any potential impacts. Anecdotally, only a small percentage of institutions nationwide are believed to have adopted a policy of using the GED® CR and GED® CR+C thresholds in their course placement and credit award decisions, and there is no up-to-date, centralized database or common signalling mechanism to help testers identify participating institutions. Conversely, the College Board, whose College Level Examination Program (CLEP) offers similar credit benefits to those promised by the GED® CR+C designation provides a detailed, searchable database that allows students to identify institution-specific policies regarding qualifying score thresholds and credits awarded (if any) for each of the 34 CLEP exams in over 2,900 partner institutions (College Board, 2021).[14]

While some estimate that roughly 400 institutions consider the GED® college readiness designations in their course placement decisions, very few institutions awarded college credits to students who earned a GED® CR+C designation (ACE CREDIT College & University Partnerships, 2018; "Colleges that accept the GED", 2020). Before retiring their College and University Partnerships Database in 2018, the American Council on Education identified only 26 colleges and universities that awarded college credits to students who earned a GED® College Ready Plus Credits designation (ACE CREDIT College & University Partnerships, 2018).[15] Indeed, even in states with the

[13] In math, the subject in which college students are most often assigned to non-credit bearing remedial coursework, only the top 7% of GED® testers earned a GED® CR or GED® CR+C designation. If an individual's probability of being assigned to remedial coursework in a given subject is decreasing in their subject test score, an exemption from developmental math coursework would likely be of limited use even for those who marginally qualify for a GED® CR designation in Mathematical Reasoning, unless more than 93% of GED® testers have a substantial probability of requiring remediation. Additionally, in social studies, the subject where the most students earn a GED® CR or GED® CR+C designation, few institutions or programs offer or require developmental coursework to enroll in introductory college-level courses.

[14] Notably, CLEP exams have been offered for over 50 years, potentially explaining their substantially more mature infrastructure for institutional partnerships to award credit for prior learning.

[15] In conversations with the author, representatives from ACE and GEDTS expressed their belief that relying exclusively the institutions listed in the defunct ACE CUP database likely substantially underestimates of the number

highest rates of ACE and ACE CUP membership, earning a GED® CR or GED® CR+C designation does not appear to influence college outcomes and exam retaking rates remain vanishingly small just below the college readiness thresholds.

If many qualifying GED® graduates find they are unable to redeem their GED® CR+C test score for college credits at their preferred post-secondary institution, this could also have a discouragement effect for those testers, potentially counterbalancing any benefits to GED® CR+C designees who do succeed in redeeming their scores for college credits, as advertised, at participating institutions. Experimental research in psychology shows that individuals who invest effort toward a goal, like studying for the GED® to earn the benefits of a college readiness designation, experience regret and disappointment if their effort goes unrewarded, which could lead them to abandon activities related to that effort or degrade trust in associated institutions (Van Dijk, Van Der Pligt, & Zeelenberg, 1999; Tzieropoulos et al., 2011).

Moreover, if institutional quality is negatively correlated with GED® CR or CR+C adoption, students could be drawn to lower quality institutions, where they are less likely to receive other supports, in order to use their GED® CR designation to avoid remedial coursework or redeem GED® CR+C credits, again providing potential countervailing pressure against the benefits of receiving college credit in acknowledgement of a high GED® subject test score. Using data from a Massachusetts scholarship program, Cohodes and Goodman (2014) show that policies that subsidize higher education can reduce educational attainment when institutional quality is negatively correlated with subsidy eligibility.

Evaluating credit for prior learning (CPL) initiatives in 72 institutions with active CPL initiatives, Klein-Collins and colleagues (2020) find that earning credit for prior learning is associated with substantially higher rates of post-secondary credential completion after controlling for baseline observable characteristics using propensity score matching methods. This analysis suggests that offering CPL through recognizing credentials like GED® CR and GED® CR+C can be mutually beneficial for students and institutions, making participating students substantially more likely to complete degrees or certificates, reducing time to degree, and generating more tuition revenue for institutions—despite the foregone earnings from credits awarded directly via CPL programs—as participating students earn more non-CPL credits and are more likely to remain enrolled through

of institutions that, in practice, accept GED® CR designations as a waiver out of remedial coursework or awarded credit to students who earned a GED® CR+C designation. However, they could not provide an estimate the true number of participating institutions, acknowledging that the difficulty of collecting and updating detailed institutional adoption data is one reason the database project ended.

credential completion. However, underlying this promising evidence is the stark reality that even in a sample of institutions with active CPL initiatives, only roughly 1 in 25 adult students was able to leverage their prior non-military educational or professional experience to earn transferable college credits.[16] Examining community and technical colleges, where the majority of matriculating college-ready GED graduates enroll, the rate of take-up for non-military CPL programs falls to only 2% of students, suggesting that universal adoption of ACE recommendations for GED ® CR+C credit awards could meaningfully increase access to CPL, but that substantial barriers to such widespread institutional adoption and individual participation in CPL programs remain.

In light of this evidence and other promising evaluations of CPL programs (e.g., Boatman et al., 2020), my finding that earning a GED® CR or GED® CR+C designation does not appear to influence college outcomes both demands further exploration and represents a substantial opportunity to strengthen programs to support college-ready GED® graduates. GED® stands out as a CPL pathway serving a target population of more disadvantaged, non-traditional students, making CPL awarded through GED® performance a potentially potent driver of educational equity, but also potentially requiring that GED college readiness be complemented by other supports to promote college matriculation and persistance for eligible GED® graduates. The GED® college readiness benchmarks are designed to identify academic preparedness, but do not measure non-academic skills that may be necessary for post-secondary success and are generally found to be negatively correlated with pursuing a high school equivalency credential through examinations like the GED® rather than completing a traditional high school diploma (Heckman & Rubinstein, 2001). Recent evidence suggests that counselors exert a strong influence on high school students' post-secondary outcomes, particularly for lower-achieving students (Mulhern, 2020); future research may assess whether college counselors, admissions officers, advisors, or other mentors play a similarly important role in helping college ready GED® graduates access program benefits and earn CPL.

Regardless of eligible students' support systems or underlying skills and abilities, they are unlikely to benefit from earning a GED ® CR or GED ® CR+C designation if local institutions do not recognize these credentials or information about where credentials are accepted is unclear or difficult to ascertain. In addition to growing and deepening institutional partnerships, GEDTS must develop clear and easily navigable processes to help eligible students and their mentors identify those

[16] Credit for military training is the most common source of credit for prior learning in the sample, but contrasts sharply with exam-based CPL programs like the GED® college readiness benchmarks or CLEP in terms of the eligible population and method of certification. Including credit for military training increases the overall rate of CPL receipt to 11% in the sample.

institutions that will consider GED® CR and GED® CR+C qualifications to understand what benefits students are eligible to receive as well as how and where these benefits can be accessed. For the GED® exam to reach its potential as an alternative pathway to post-secondary success, GEDTS must expand the visibility, reach, and utility of its college readiness designations.

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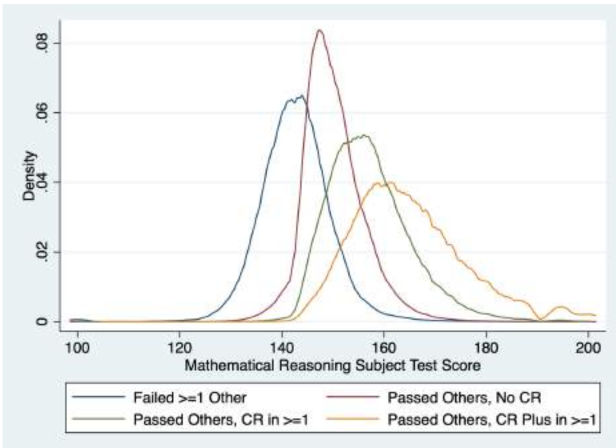
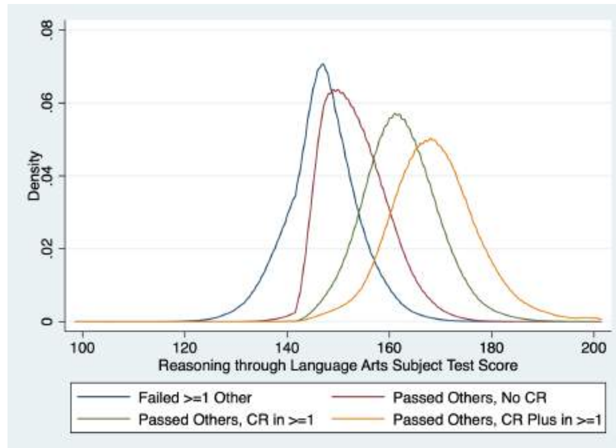
# Figures

Figure 1: GED® subject test score distributions by performance in other subjects

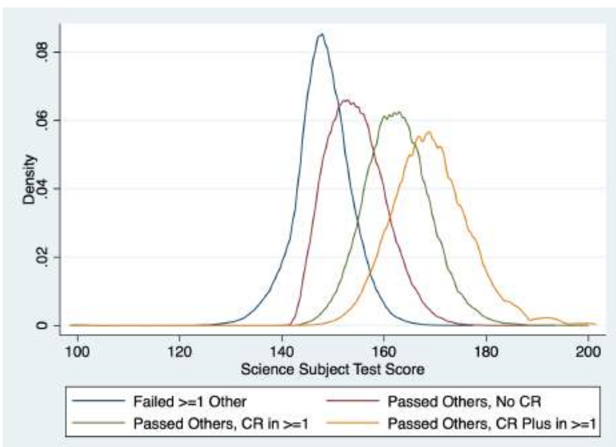
(a) Mathematical Reasoning



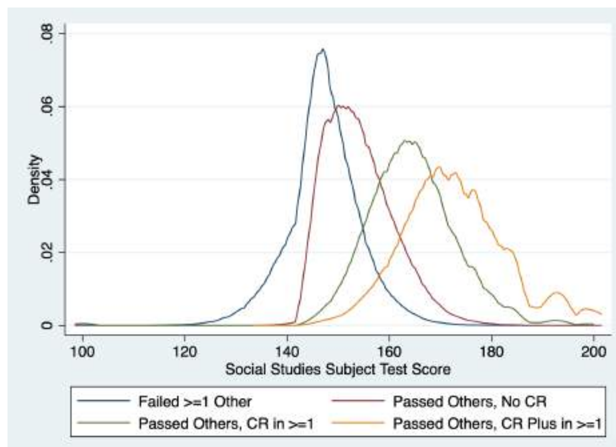

(b) Reasoning through Language Arts




(c) Science



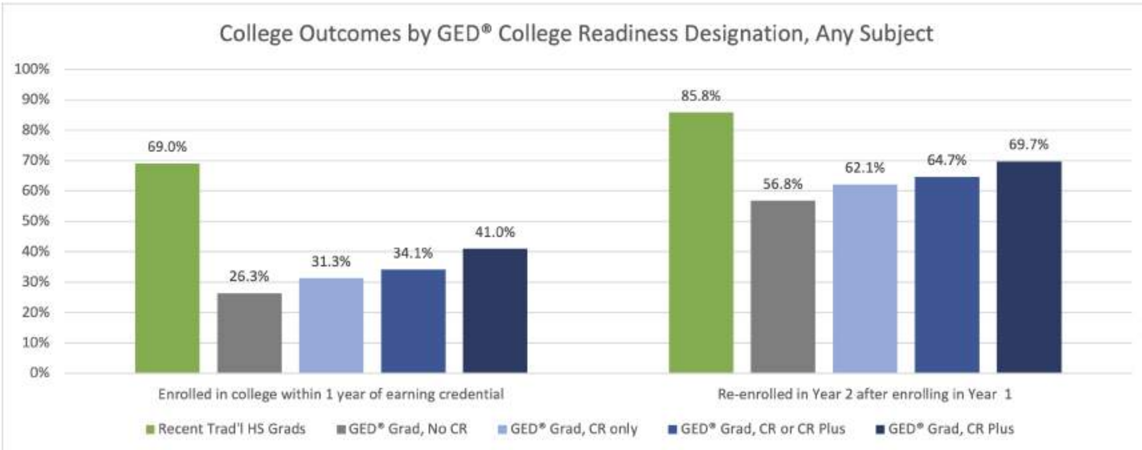

(d) Social Studies



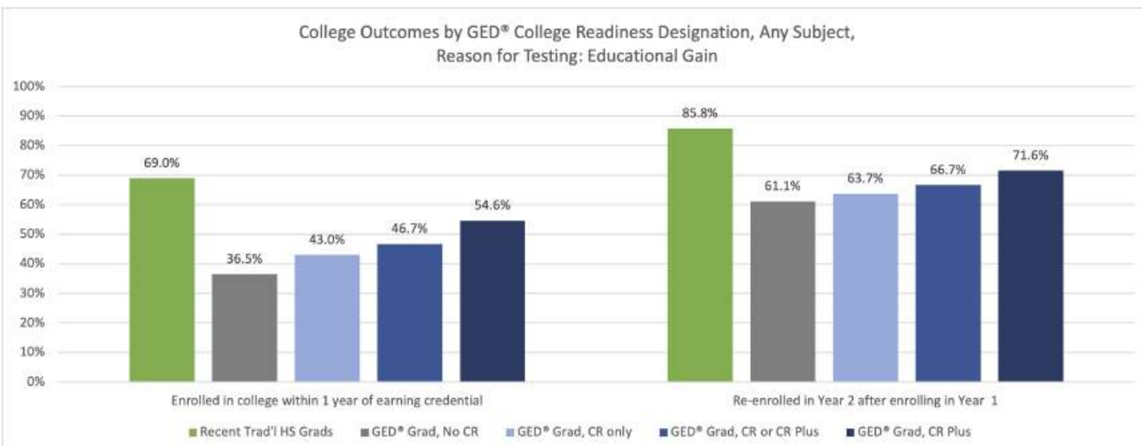

**Notes:** Each graph plots the density of GED® subject test scores by an individual's category of performance in all other subjects, as indicated in the graph's legend. N=644,615.

Figure 2: College outcomes by GED® performance versus a national sample of traditional HS grads

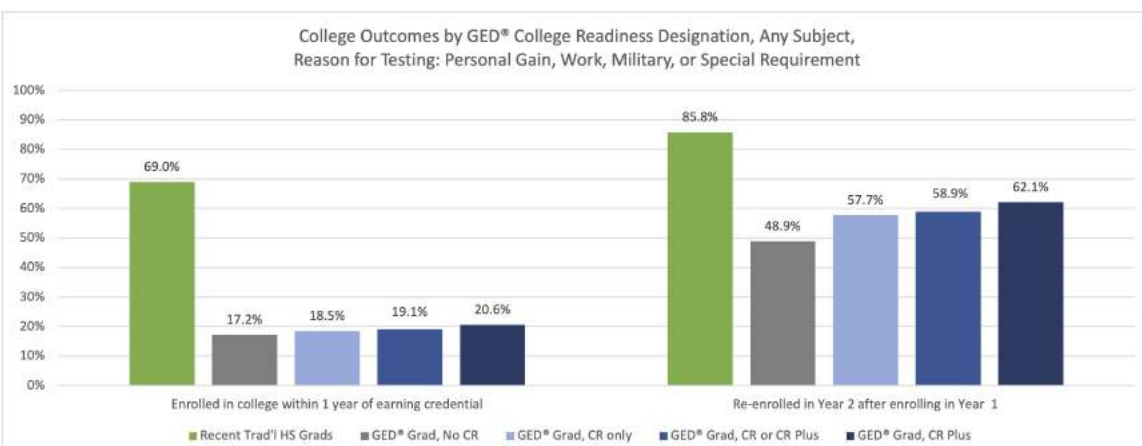
(a) Full matched analytic sample



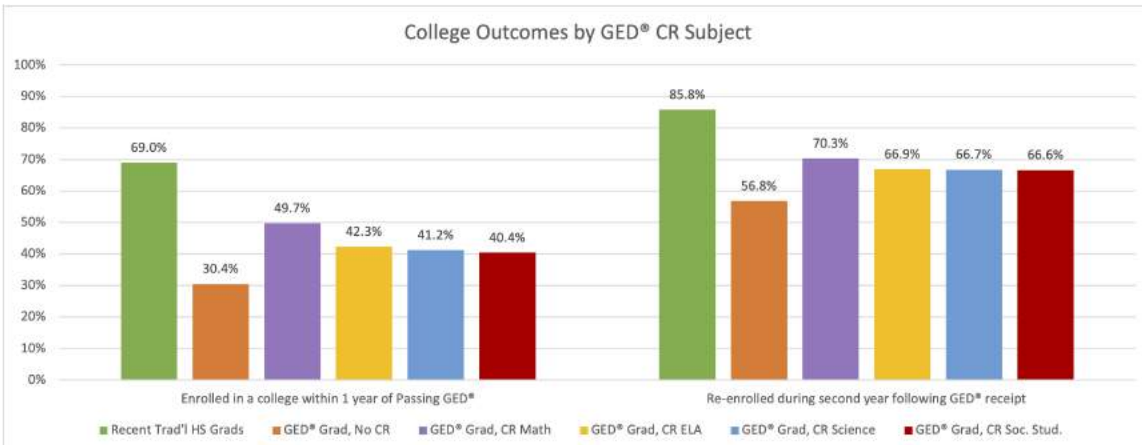

(b) Subgroup: Reason for testing = Educational Gain




(c) Subgroup: Reason for testing = Other



(d) Full matched sample, by GED® CR subject




(e) Full matched sample, by GED® CR+C subject

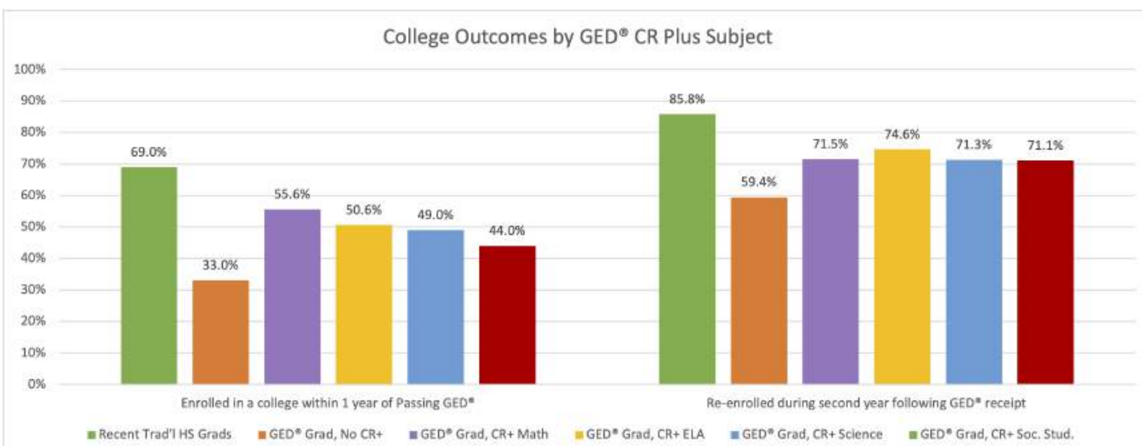
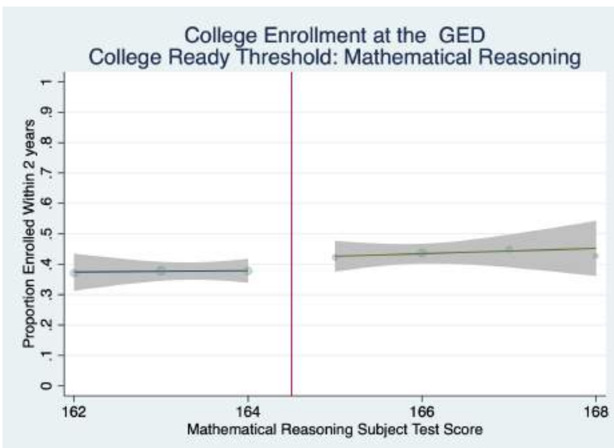
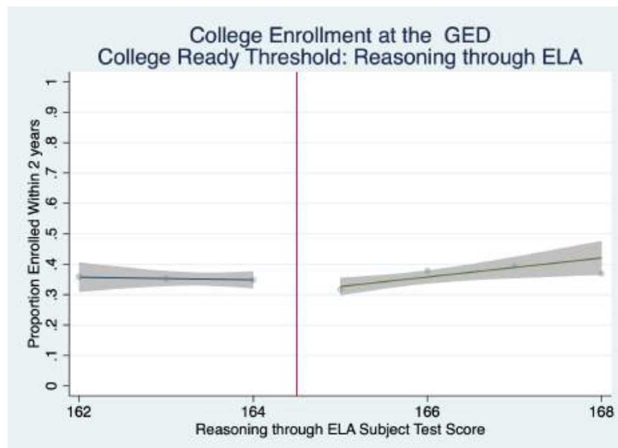


Figure 3: RD plots, college enrollment at the GED® CR threshold by subject test

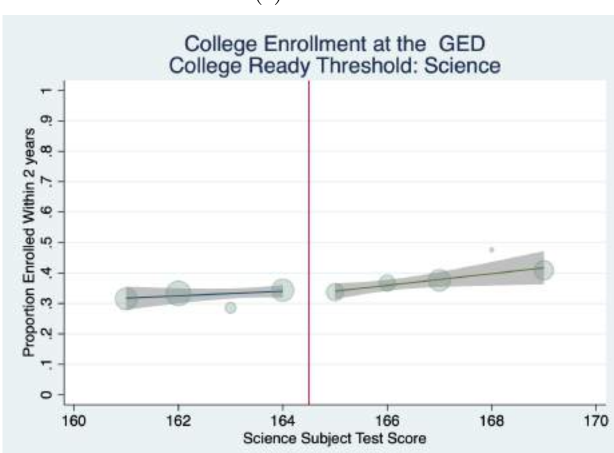
(a) Mathematical Reasoning




(b) Reasoning through Language Arts




(c) Science




(d) Social Studies

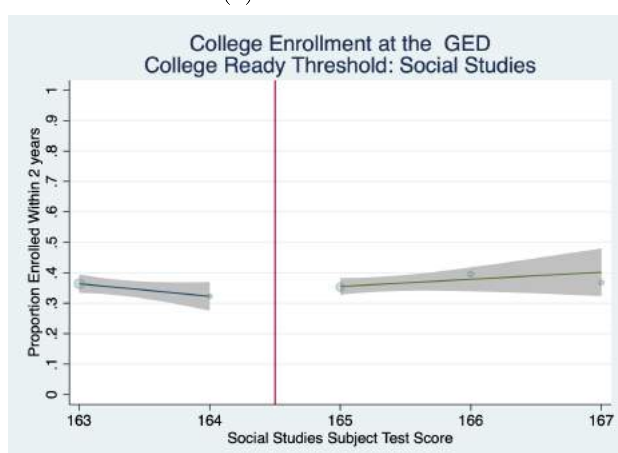
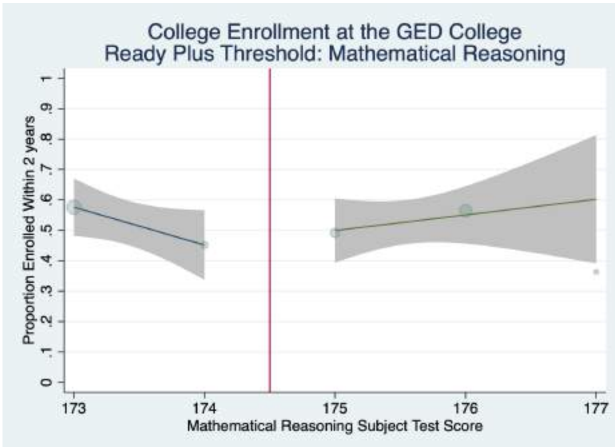
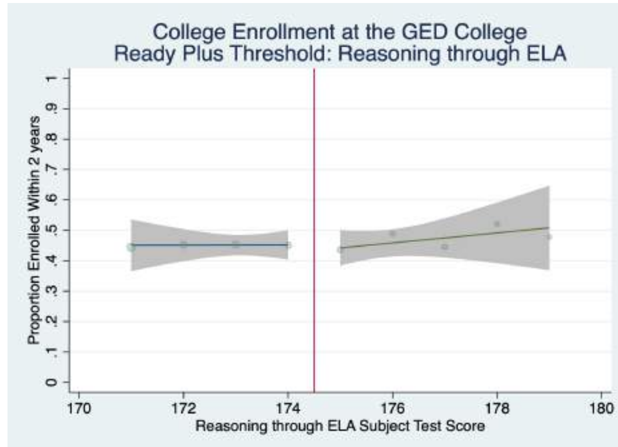


Figure 3 (con't): RD plots, college enrollment at the GED® CR+C threshold by subject test

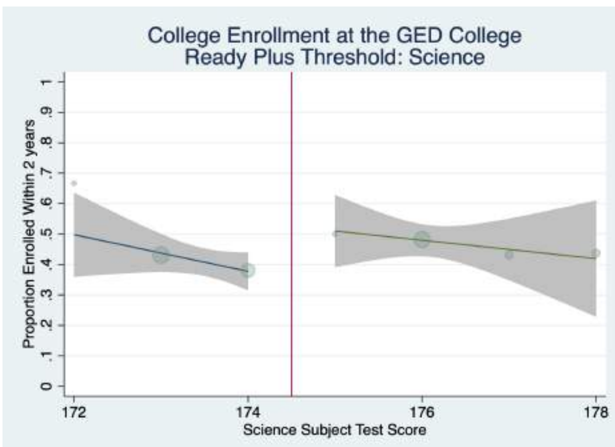
(e) Mathematical Reasoning



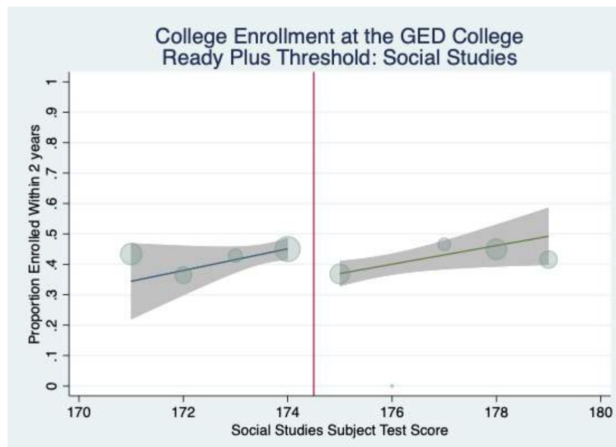

(f) Reasoning through Language Arts




(g) Science



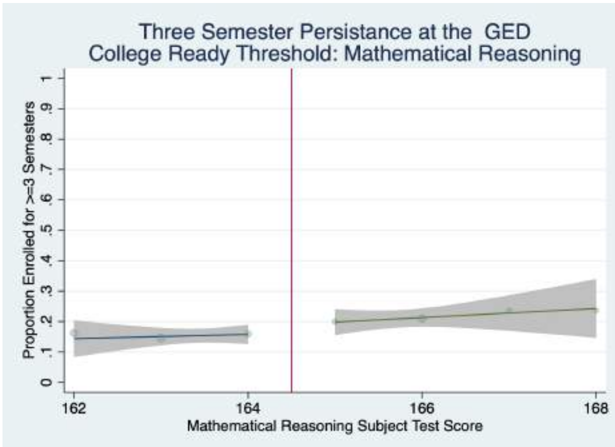

(h) Social Studies



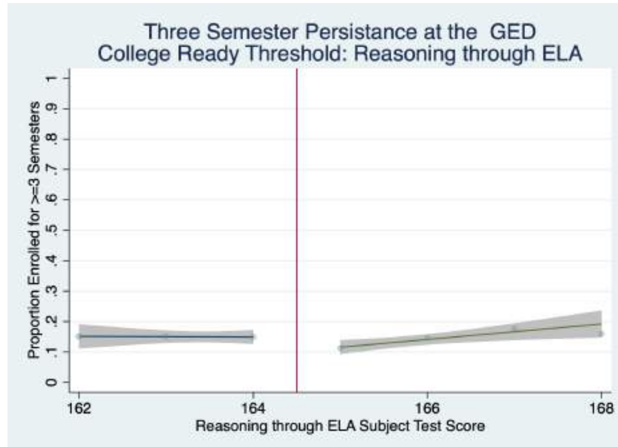

**Notes:** Each graph plots rates of college enrollment above and below the indicated GED® subject test score thresholds, as well as lines of best fit and 95% confidence interval on either side of the threshold. College enrollment is a binary variable that takes on the value 1 if an individual was observed in National Student Clearinghouse (NSC) data as enrolled in college within two years of their first GED® subject test attempt and zero otherwise. Bandwidth and effective sample size vary by subject test threshold, determined using the optimal bandwidth calculations described in Calonico et al. (2019); see Table 4 for the effective number of observations that contribute to each estimate. Distance from each threshold is modeled as a linear function with triangular kernel weights and separate slopes above and below each threshold, as in Equation (2). Points are scaled relative to the size of the sample that earned that subject test score.

Figure 4: RD plots, college persistence at the GED® CR threshold by subject test

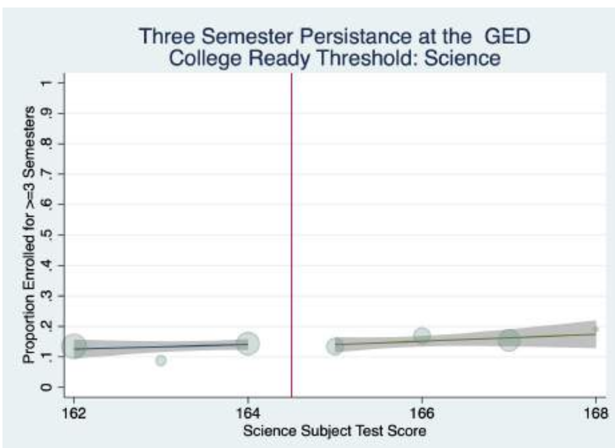
(a) Mathematical Reasoning




(b) Reasoning through Language Arts




(c) Science




(d) Social Studies

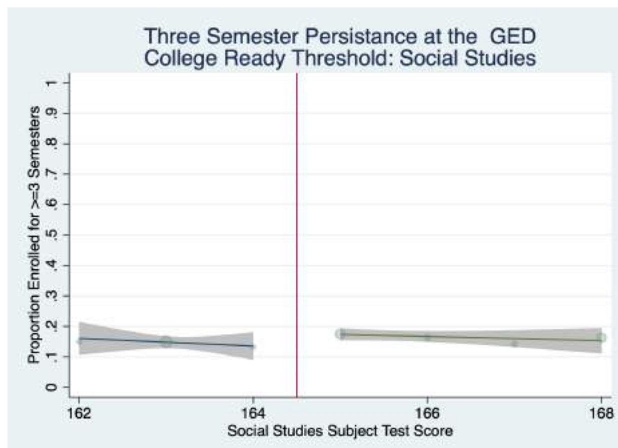
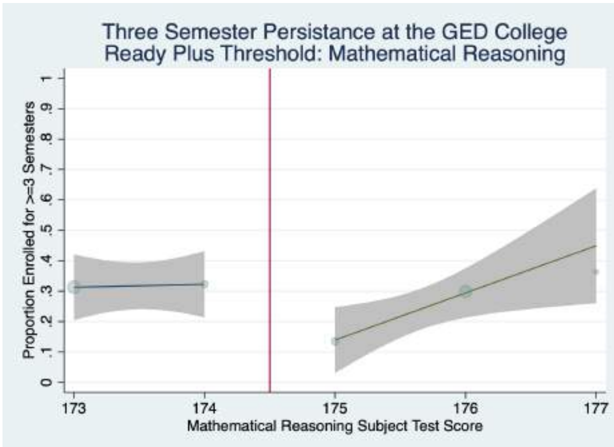
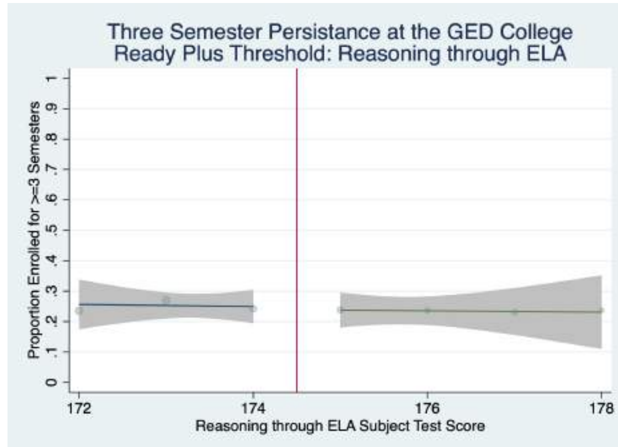


Figure 4 (con't): RD plots, college persistence at the GED® CR+C threshold by subject test

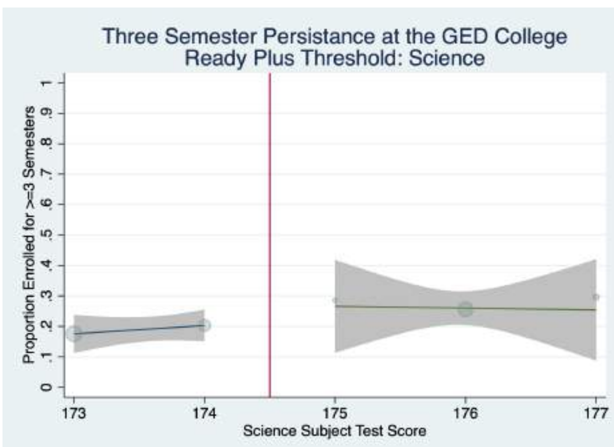
(e) Mathematical Reasoning



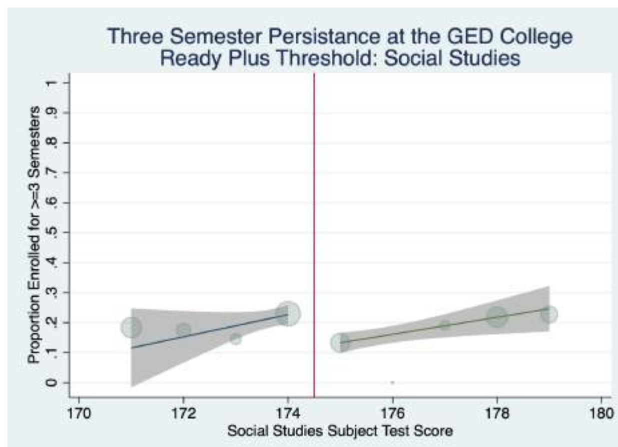

(f) Reasoning through Language Arts




(g) Science



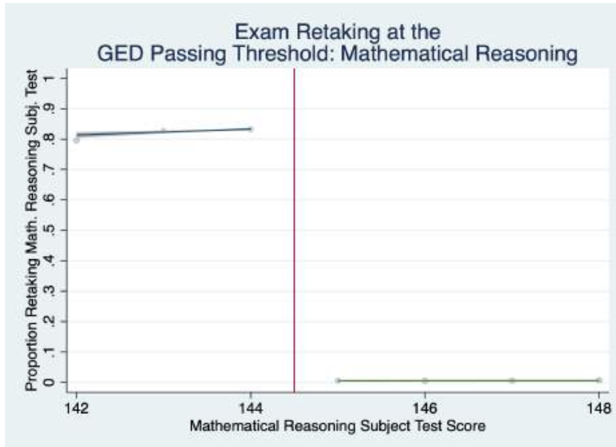

(h) Social Studies



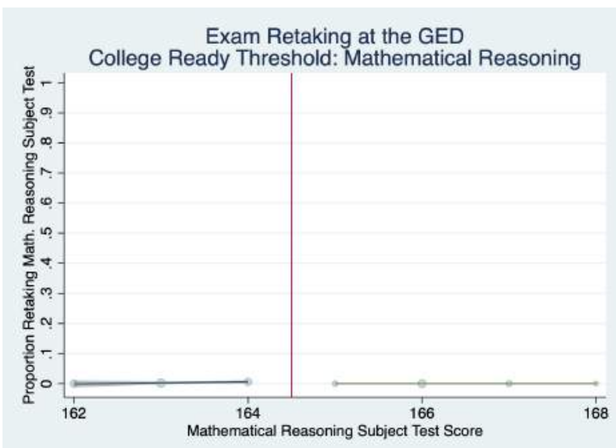

**Notes:** Each graph plots rates of three semester persistence above and below the indicated GED® subject test score thresholds, as well as lines of best fit and 95% confidence interval on either side of the threshold.Three semester persistence is a binary variable that takes on the value 1 if an individual was observed in National Student Clearinghouse (NSC) data as enrolled in college for at least six quarters within two years of their first GED® subject test attempt and zero otherwise. Bandwidth and effective sample size vary by subject test threshold, determined using the optimal bandwidth calculations described in Calonico et al. (2019); see Table 4 for the effective number of observations that contribute to each estimate. Distance from each threshold is modeled as a linear function with triangular kernel weights and separate slopes above and below each threshold, as in Equation (2). Points are scaled relative to the size of the sample that earned that subject test score.

Figure 5: RD plots, subject test retaking by threshold (Mathematical Reasoning)

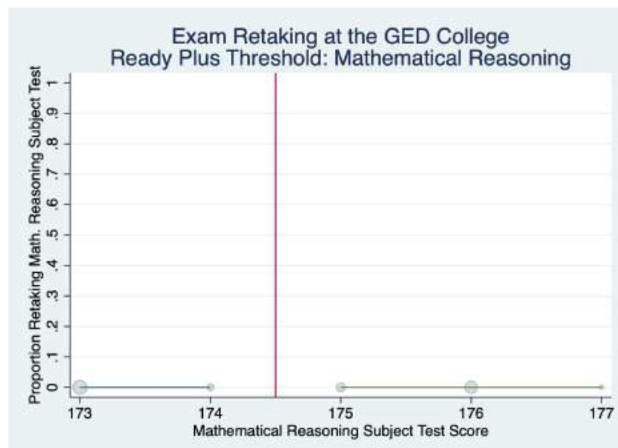
(a) Passing Threshold




(b) GED® CR Threshold




(c) GED® CR+C Threshold




**Notes:** This figure plots rates of exam retaking above and below the indicated GED® subject test score thresholds, as well as a line of best fit and 95% confidence interval on either side of the threshold. Exam retaking is a binary variable that takes on the value 1 if an individual was observed taking a GED® subject test in the indicated content area more than once and zero otherwise. Bandwidth and effective sample size vary by subject test threshold, determined using the optimal bandwidth calculations described in Calonico et al. (2019); see panel D of Table 3 for the effective number of observations that contribute to each estimate. Distance from each threshold is modeled as a linear function with triangular kernel weights and separate slopes above and below each threshold, as in Equation (2). Points are scaled relative to the size of the sample that earned that subject test score.

## Tables

Table 1: Summary Statistics

| Characteristic | All Testers (1) | Analytic Sample (2) | Passed GED® (3) | NSC Sample (4) | P-Value (3)=(4) (5) | GED® CR (6) | GED® CR+C (7) |
|---|---|---|---|---|---|---|---|
| A. Demographics | | | | | | | |
| Age at first test attempt | 26.1 | 25.1 | 22.7 | 22.7 | .251 | 23.2 | 23.2 |
| Male | .565 | .500 | .572 | .564 | .662 | .593 | .631 |
| Asian | .024 | .028 | .028 | .029 | .237 | .039 | .060 |
| Black | .191 | .167 | .074 | .080 | .064 | .050 | .030 |
| Hispanic | .255 | .224 | .172 | .168 | .303 | .145 | .112 |
| Native American | .017 | .017 | .012 | .013 | .788 | .010 | .007 |
| White | .451 | .486 | .625 | .625 | .998 | .664 | .694 |
| Multi-Racial | .040 | .048 | .059 | .058 | .058 | .062 | .064 |
| Other Race | .022 | .030 | .029 | .030 | .605 | .031 | .032 |
| Employed | .399 | .468 | .462 | .459 | .478 | .467 | .450 |
| Unemployed | .324 | .346 | .342 | .343 | .824 | .329 | .308 |
| Permanently Disabled | .011 | .013 | .007 | .006 | .256 | .008 | .009 |
| Retired | .005 | .004 | .002 | .002 | .566 | .003 | .003 |
| B. Baseline Survey Data | | | | | | | |
| Motivation: Personal | .295 | .266 | .218 | .219 | .896 | .198 | .160 |
| Motivation: Work | .202 | .226 | .217 | .220 | .125 | .221 | .207 |
| Motivation: Education | .423 | .457 | .517 | .512 | .136 | .537 | .593 |
| Motivation: Special Requirement | .057 | .021 | .015 | .016 | .169 | .013 | .010 |
| Motivation: Military | .024 | .029 | .034 | .031 | .493 | .032 | .029 |
| Paid for Test Prep | .395 | .464 | .476 | .473 | .899 | .499 | .525 |
| Prepared via Practice Test | .356 | .413 | .403 | .405 | .728 | .378 | .341 |
| Prepared via Books | .269 | .243 | .248 | .248 | .413 | .258 | .267 |
| Prepared via Online Resources | .133 | .168 | .196 | .193 | .927 | .215 | .241 |
| Prepared via Audio Resources | .009 | .010 | .008 | .009 | .599 | .008 | .007 |
| Prepared via Television | .004 | .005 | .004 | .003 | .168 | .003 | .003 |
| Prepared via Mobile App | .032 | .044 | .052 | .052 | .607 | .056 | .055 |
| Prepared via Social Network | .021 | .026 | .024 | .023 | .858 | .023 | .021 |
| Prepared via Other Resources | .021 | .023 | .024 | .024 | .574 | .024 | .024 |
| Prepared via Adult Education | .434 | .374 | .295 | .299 | .528 | .256 | .189 |
| Studied for Exam | .833 | .816 | .786 | .788 | .875 | .769 | .732 |
| Studied at Test Prep Center | .288 | .334 | .284 | .298 | .102 | .252 | .192 |
| Studied at Testing Center | .032 | .037 | .027 | .028 | .669 | .022 | .015 |
| Studied at HS Program | .092 | .109 | .093 | .095 | .329 | .080 | .061 |
| Studied at CC Program | .058 | .069 | .058 | .058 | .776 | .053 | .045 |
| Studied at Workplace Program | .015 | .018 | .012 | .013 | .319 | .010 | .007 |
| Studied at Online Program | .089 | .113 | .128 | .124 | .441 | .134 | .137 |
| Studied at Military Program | .005 | .005 | .004 | .003 | .036 | .003 | .002 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Studied at Correctional Facility | .157 | .023 | .015 | .014 | .390 | .011 | .007 |
| Studied via Tutoring | .061 | .070 | .063 | .066 | .452 | .061 | .053 |
| Studied in Self-Directed Setting | .266 | .322 | .385 | .380 | .814 | .417 | .466 |
| Studied at Other | .029 | .030 | .023 | .023 | .959 | .019 | .014 |
| Highest grade = 9 or lower | .231 | .214 | .173 | .174 | .547 | .168 | .155 |
| Past Year Income Above Median | .359 | .423 | .409 | .405 | .690 | .423 | .405 |
| Reason for no diploma: Academic | .437 | .428 | .411 | .408 | .607 | .397 | .363 |
| Reason for no diploma: Personal | .717 | .720 | .714 | .719 | .201 | .699 | .653 |
| Reason for no diploma: Other | .069 | .055 | .051 | .051 | .627 | .052 | .060 |
| Reason for no diploma: Homeschool | .041 | .051 | .080 | .078 | .479 | .097 | .137 |
| Reason for no diploma: Int'l | .033 | .031 | .027 | .026 | .696 | .034 | .046 |
| C. Missing Data Indicators | | | | | | | |
| Missing Race Data | .09 | .075 | .081 | .086 | .012 | .088 | .106 |
| Missing Gender Data | .034 | .047 | .054 | .058 | .013 | .063 | .082 |
| Missing Labor Force Status | .019 | .006 | .006 | .006 | .453 | .005 | .003 |
| Missing Motivation Data | .019 | .007 | .006 | .006 | .363 | .005 | .003 |
| Missing Educational Attainment | .073 | .054 | .049 | .049 | .577 | .054 | .060 |
| Missing Reason for No Diploma | .019 | .006 | .006 | .006 | .418 | .005 | .003 |
| D. Sample Exclusion Parameters | | | | | | | |
| First attempt after 1/26/2016 | .696 | 1 | 1 | 1 | — | 1 | 1 |
| Tested in English | .955 | 1 | 1 | 1 | — | 1 | 1 |
| Tested in a Correctional Facility | .188 | 0 | 0 | 0 | — | 0 | 0 |
| E. GED® Test Score Data | | | | | | | |
| Ever Passed GED® | .621 | .636 | 1 | 1 | — | .899 | .925 |
| GED® CR - Math | .065 | .073 | .157 | .150 | .551 | .277 | .516 |
| GED® CR - ELA | .117 | .127 | .285 | .275 | .110 | .521 | .734 |
| GED® CR - Science | .110 | .134 | .305 | .297 | .033 | .523 | .747 |
| GED® CR - Soc. Stud. | .137 | .160 | .349 | .337 | .031 | .641 | .869 |
| GED® CR - Any Subject | .197 | .224 | .379 | .533 | .134 | 1 | 1 |
| GED® CR+C - Math | .016 | .020 | .044 | .040 | .515 | .076 | .276 |
| GED® CR+C - ELA | .019 | .022 | .055 | .053 | .251 | .091 | .338 |
| GED® CR+C - Science | .015 | .020 | .048 | .047 | .650 | .077 | .282 |
| GED® CR+C - Soc. Stud. | .034 | .042 | .098 | .084 | .027 | .167 | .611 |
| GED® CR+C - Any Subject | .049 | .060 | .163 | .151 | .196 | .270 | 1 |
| 1st Math Subj. Test Score | 149.7 | 150.4 | 157.1 | 156.7 | .467 | 159.5 | 166.6 |
| 1st ELA Subj. Test Score | 152.9 | 153.2 | 160.5 | 160.1 | .004 | 164.4 | 170.1 |
| 1st Science Subj. Test Score | 153.8 | 154.9 | 161.3 | 161.2 | .094 | 164.6 | 169.8 |
| 1st Soc. Stud. Subj. Test Score | 153.0 | 154.0 | 161.7 | 161.3 | .004 | 166.7 | 174.9 |
| Observations | 1,258,509 | 644,615 | 320,918 | 15,262 | | 144,228 | 38,995 |

**Notes:** Columns (1) through (4), (6), and (7) report the mean value of the covariate listed each row for the sample indicated in each column. Column (5) reports the p-value from a test of equivalence between the means in column (3) and column (4).

Table 2: Balance Tests

| | Mathematical Reasoning | Reasoning Thru. ELA | Science | Soc. Stud. |
|---|---|---|---|---|
| A. RD Estimates GED® College Ready Threshold (Subscore≥165) | | | | |
| Age at first test attempt | .0542 | .1392 | .7435* | .5059 |
| | (.6553) | (.5441) | (.4172) | (1.0355) |
| Male | .0149 | -.0105 | -.0216 | -.1311 |
| | (.0585) | (.0413) | (.0294) | (.0822) |
| Asian | -.0185 | -.0356* | -.0241 | -.0004 |
| | (.0265) | (.0192) | (.0165) | (.0255) |
| Black | .0053 | .0032 | -.0084 | .0611 |
| | (.029) | (.0182) | (.014) | (.0407) |
| Hispanic | .0135 | -.0034 | .0232 | .0236 |
| | (.0431) | (.0274) | (.0218) | (.0453) |
| Native American | -.0103 | .0044 | .0059 | .0085 |
| | (.0132) | (.0071) | (.0063) | (.0146) |
| White | .0099 | .0245 | .0115 | -.0401 |
| | (.0636) | (.0487) | (.0317) | (.0797) |
| Multi-Racial | -.0043 | .0105 | -.0019 | -.0438 |
| | (.0305) | (.0178) | (.0144) | (.043) |
| Other Race | .0169 | .002 | -.0065 | -.0174 |
| | (.0198) | (.0147) | (.0107) | (.0359) |
| Employed | -.1151 | .0864* | .0317 | .090 |
| | (.0733) | (.051) | (.0295) | (.0821) |
| Unemployed | .0935 | -.0685 | .0228 | -.0235 |
| | (.067) | (.0482) | (.0286) | (.0775) |
| Permanently Disabled | .0032 | -.009 | -.0036 | -.0172 |
| | (.01) | (.0078) | (.0047) | (.0155) |
| Motivation: Personal | -.0025 | .0497 | -.0343 | -.0367 |
| | (.0461) | (.0311) | (.0241) | (.0658) |
| Motivation: Work | .0204 | .0429 | .0482* | .0524 |
| | (.0477) | (.0323) | (.026) | (.0666) |
| Motivation: Education | -.0148 | -.0592 | -.0218 | .0423 |
| | (.0613) | (.0392) | (.0322) | (.0812) |
| Motivation: Special Requirement | .0172 | -.0072 | -.0008 | -.0193 |
| | (.0162) | (.009) | (.0069) | (.0244) |
| Motivation: Military | -.0117 | -.0423** | .0092 | -.0439 |
| | (.0232) | (.018) | (.0104) | (.0347) |
| Paid for Test Prep | -.0547 | .0122 | .0255 | -.0546 |
| | (.0695) | (.0406) | (.0339) | (.0929) |
| Prepared via Practice Test | -.0273 | .0293 | .0621** | -.0184 |
| | (.0559) | (.0404) | (.0275) | (.0812) |
| Prepared via Books | -.0618 | .007 | .0818*** | .0902 |
| | (.0587) | (.0349) | (.0283) | (.0665) |
| Prepared via Online Resources | -.012 | .0404 | .0017 | .127** |
| | (.051) | (.0307) | (.0236) | (.0647) |
| Prepared via Mobile App | .0201 | -.0545** | .0003 | -.0471 |
| | (.0314) | (.0257) | (.0144) | (.0435) |
| Prepared via Social Network | .0239 | -.0111 | -.0001 | .0083 |
| | (.0154) | (.0132) | (.0091) | (.0205) |

| | | | | |
|---|---|---|---|---|
| Prepared via Other Resources | .0074 | -.0015 | -.0267 | -.0351 |
| | (.0176) | (.0105) | (.0173) | (.0319) |
| Prepared via Adult Education | .0006 | .0255 | -.0316 | -.0743 |
| | (.056) | (.0437) | (.0267) | (.0713) |
| Studied for Exam | -.0071 | .0112 | .0118 | .0345 |
| | (.0528) | (.0293) | (.0243) | (.0681) |
| Studied at Test Prep Center | .0424 | .0421 | -.0484* | -.0565 |
| | (.0507) | (.0428) | (.0277) | (.0703) |
| Studied at Testing Center | .0042 | .0159 | .0085 | .026 |
| | (.0163) | (.0107) | (.009) | (.0188) |
| Studied at HS Program | .0148 | .0182 | .0104 | .0452 |
| | (.0306) | (.0212) | (.0156) | (.0462) |
| Studied at CC Program | -.0332 | -.0048 | -.0059 | .015 |
| | (.0272) | (.0165) | (.0132) | (.0365) |
| Studied at Workplace Program | .0254** | -.0109 | .0129* | .0106** |
| | (.0099) | (.0095) | (.0067) | (.0042) |
| Studied at Online Program | .0201 | .0016 | .0204 | .0722 |
| | (.0404) | (.0259) | (.0187) | (.0545) |
| Studied at Correctional Facility | -.0163 | -.0077 | .0051 | .003 |
| | (.0145) | (.0084) | (.0069) | (.0165) |
| Studied via Tutoring | -.0134 | .0261 | .0064 | .0814** |
| | (.0238) | (.0186) | (.0156) | (.0393) |
| Studied in Self-Directed Setting | -.0307 | -.0096 | .022 | .0479 |
| | (.0553) | (.0377) | (.0311) | (.0801) |
| Studied at Other | -.0293 | -.0088 | .005 | -.0101 |
| | (.022) | (.0122) | (.0087) | (.0242) |
| Highest grade = 9 or lower | -.0241 | .0033 | .0344 | -.0343 |
| | (.0477) | (.0289) | (.0221) | (.0624) |
| Past Year Income Above Median | -.0756 | .0989** | .034 | .0001 |
| | (.0638) | (.0495) | (.0316) | (.0806) |
| Reason for no diploma: Academic | -.0846 | -.03 | .0568* | .0678 |
| | (.0627) | (.0387) | (.0297) | (.0801) |
| Reason for no diploma: Personal | .027 | .0333 | .0051 | -.031 |
| | (.0598) | (.0347) | (.0267) | (.074) |
| Reason for no diploma: Other | -.0082 | -.0182 | -.0026 | .0022 |
| | (.0282) | (.0167) | (.0132) | (.0353) |
| Reason for no diploma: Homeschool | -.0291 | .0345* | -.0264 | .0082 |
| | (.0433) | (.0205) | (.0174) | (.0455) |
| Reason for no diploma: Int'l | .0075 | -.0232* | -.0016 | -.0103 |
| | (.0221) | (.0133) | (.0098) | (.0288) |
| B. RD Estimates GED® College Ready Threshold (Subscore≥175) | | | | |
| Age at first test attempt | 1.1608 | .2026 | -.2119 | .2033 |
| | (2.0977) | (1.0501) | (1.3659) | (.6599) |
| Male | -.1117 | -.0259 | .0707 | .0117 |
| | (.2188) | (.0782) | (.0694) | (.0444) |
| Asian | .0374 | -.0381 | -.0063 | -.0324* |
| | (.1129) | (.0349) | (.0496) | (.0173) |
| Black | -.0431 | .0058 | .0873* | .0103 |
| | (.1199) | (.0286) | (.0451) | (.025) |
| Hispanic | -.0859 | .0262 | -.0156 | -.0482 |
| | (.1238) | (.047) | (.0441) | (.0364) |
| Native American | .0321 | -.0013 | .0083 | -.0055 |
| | (.0302) | (.013) | (.0222) | (.006) |
| White | -.1497 | .0797 | -.0312 | .0453 |

| | | | | |
|---|---|---|---|---|
| | (.2126) | (.0736) | (.1019) | (.0477) |
| Multi-Racial | .0602 | .0101 | .0568 | .0108 |
| | (.0923) | (.0419) | (.0738) | (.0251) |
| Other Race | .1423* | -.0707 | -.0185 | .0142 |
| | (.0809) | (.046) | (.024) | (.0198) |
| Employed | .3367 | -.0578 | -.0303 | -.061 |
| | (.2424) | (.0757) | (.0652) | (.0472) |
| Unemployed | -.2002 | .0022 | -.0779 | .0482 |
| | (.242) | (.0673) | (.1004) | (.0539) |
| Permanently Disabled | 0 | -.0074 | -.0904 | .003 |
| | — | (.0134) | (.0596) | (.0055) |
| Motivation: Personal | .0901 | -.0807 | .0371 | -.0233 |
| | (.1574) | (.0541) | (.0792) | (.0329) |
| Motivation: Work | -.2652 | .0362 | .0297 | .0107 |
| | (.2018) | (.0626) | (.1026) | (.0372) |
| Motivation: Education | .1699 | .012 | -.0548 | -.0189 |
| | (.2275) | (.0585) | (.1343) | (.0433) |
| Motivation: Special Requirement | .0105 | -.0198 | -.0317 | -.0094 |
| | (.015) | (.0152) | (.0278) | (.0089) |
| Motivation: Military | -.0485 | .0334* | -.034 | .0397** |
| | (.0537) | (.0195) | (.0217) | (.0172) |
| Paid for Test Prep | .5299* | .0037 | .0288 | .0065 |
| | (.2839) | (.0822) | (.1584) | (.052) |
| Prepared via Practice Test | -.1073 | -.1033 | -.0603 | -.0024 |
| | (.1964) | (.0705) | (.0649) | (.0416) |
| Prepared via Books | .1084 | .0184 | -.0313 | -.067* |
| | (.1247) | (.0655) | (.123) | (.0389) |
| Prepared via Online Resources | .1417 | -.0724 | .0365 | .0308 |
| | (.148) | (.0657) | (.0499) | (.0384) |
| Prepared via Mobile App | .0176 | -.077* | .0045 | -.0127 |
| | (.0637) | (.0398) | (.0643) | (.019) |
| Prepared via Social Network | .0229 | -.0018 | .0397* | -.0029 |
| | (.0923) | (.0243) | (.0235) | (.0183) |
| Prepared via Other Resources | -.0561 | .0078 | .0098 | .0049 |
| | (.0495) | (.0166) | (.0204) | (.0128) |
| Prepared via Adult Education | .1774 | .0174 | .1036 | -.0125 |
| | (.1201) | (.0542) | (.1013) | (.0327) |
| Studied for Exam | .0005 | -.0182 | -.0778 | -.0107 |
| | (.1967) | (.0661) | (.1136) | (.0385) |
| Studied at Test Prep Center | .1203 | .0014 | .0295 | -.005 |
| | (.1469) | (.055) | (.0491) | (.0354) |
| Studied at Testing Center | -.0054 | -.042 | .0104 | -.0014 |
| | (.0548) | (.0305) | (.0271) | (.0093) |
| Studied at HS Program | -.0645 | -.0067 | .1055** | .0123 |
| | (.1194) | (.0352) | (.046) | (.0223) |
| Studied at CC Program | .0855 | -.0112 | .0188 | -.0219 |
| | (.0666) | (.0247) | (.0271) | (.0157) |
| Studied at Workplace Program | 0 | -.0107 | .0112 | .0098 |
| | — | (.0133) | (.0165) | (.0082) |
| Studied at Online Program | -.0798 | -.0907* | -.0305 | -.0028 |
| | (.1582) | (.0538) | (.0716) | (.0296) |
| Studied at Correctional Facility | -.0137 | -.0265 | -.0174 | .0041 |
| | (.0167) | (.0180) | (.0141) | (.0075) |
| Studied via Tutoring | -.0987 | .0175 | .0338 | -.0497** |

| | | | | |
|---|---|---|---|---|
| | (.1190) | (.0301) | (.0278) | (.0199) |
| Studied in Self-Directed Setting | .0433 | -.0258 | -.2363* | -.0201 |
| | (.1508) | (.0814) | (.1326) | (.0441) |
| Studied at Other | -.0339 | .0054 | .0229 | .0041 |
| | (.0579) | (.0168) | (.0169) | (.0128) |
| Highest grade = 9 or lower | .1338 | -.0385 | .0431 | -.0539 |
| | (.1332) | (.0597) | (.0515) | (.0356) |
| Past Year Income Above Median | .2428 | -.0653 | -.1411 | -.0113 |
| | (.2131) | (.0648) | (.1229) | (.0442) |
| Reason for no diploma: Academic | -.2559 | -.0191 | .0380 | -.0268 |
| | (.2195) | (.0654) | (.101) | (.0416) |
| Reason for no diploma: Personal | .0629 | -.0585 | .0303 | .0510 |
| | (.2273) | (.0689) | (.1226) | (.0394) |
| Reason for no diploma: Other | .0487 | -.0211 | -.0004 | .0307 |
| | (.1166) | (.0346) | (.0369) | (.0199) |
| Reason for no diploma: Homeschool | .0453 | .0974* | .0316 | -.0415 |
| | (.1324) | (.0522) | (.0778) | (.0306) |
| Reason for no diploma: Int'l | .0272 | .0043 | -.0344 | -.0073 |
| | (.1365) | (.0227) | (.0278) | (.0143) |

**Notes:** This table reports coefficients testing whether discontinuities exist in the covariate indicated in each row at the GED® College Ready (Panel A) or GED® College Ready Plus Credits (Panel B) thresholds. Distance from each threshold is modeled as a linear function with separate slopes above and below the threshold, as in Equation (5). Bandwidth varies by covariate and subject test threshold, determined using the optimal bandwidth calculations described in Calonico et al. (2019). $^{*} = p < 0.1$, $^{**} = p < 0.05$, $^{***} = p < 0.01$. To conserve space, I have omitted balance tests for all missing data variables as well as any baseline characteristics that characterize less than one percent of the sample in column (2) of Table 1. The sample is limited to the NSC sample described in column (4) of Table 1, N=15,262.

Table 3: First-Stage Estimates

| | Mathematical Reasoning (1) | Reasoning thru. ELA (2) | Science (3) | Social Studies (4) |
|---|---|---|---|---|
| A. Discontinuities in subject-specific college readiness designations (NSC Sample) | | | | |
| GED® CR | .9972*** | .9939*** | .9990*** | 1.0007*** |
| | (.0021) | (.0028) | (.0007) | (.0007) |
| | 7153 | 6993 | 9336 | 4694 |
| GED® CR+C | 1*** | 1*** | .9985*** | 1*** |
| | — | — | (.0019) | — |
| | 1099 | 403 | 761 | 2198 |
| B. Discontinuities in any college readiness designation (NSC Sample) | | | | |
| GED® CR | .2429*** | .2878*** | .3546*** | .3878*** |
| | (.0239) | (.0196) | (.0183) | (.0238) |
| | 4147 | 6993 | 8262 | 6846 |
| GED® CR+C | .6008*** | .4789*** | .4086*** | .5722*** |
| | (.1802) | (.0838) | (.0852) | (.0444) |
| | 369 | 725 | 824 | 1244 |
| C. Discontinuities in Retaking Behavior (NSC Sample) | | | | |
| At GED® CR Threshold (165) | -.0132 | -.0050 | .0003 | .0016 |
| | (.0096) | (.0043) | (.0019) | (.0012) |
| | 2048 | 4916 | 4389 | 3782 |
| At GED® CR+C Threshold (175) | 0 | .0053 | -.0013 | 0 |
| | — | (.0054) | (.0018) | — |
| | 369 | 725 | 761 | 1701 |
| D. Discontinuities in Retaking Behavior (Full Sample) | | | | |
| At Passing Threshold (145) | -.8076*** | -.7536*** | -.7644*** | -.7230*** |
| | (.0053) | (.0048) | (.0054) | (.0094) |
| | 156435 | 161160 | 123635 | 86947 |
| At GED® CR Threshold (165) | .0010 | -.0018** | -.0004 | -.0003 |
| | (.0026) | (.0007) | (.0012) | (.0012) |
| | 14208 | 94616 | 34397 | 55170 |
| At GED® CR+C Threshold (175) | -.0077 | -.0052** | -.0031 | -.0009 |
| | (.0066) | (.0024) | (.0019) | (.0015) |
| Observations | 6474 | 12039 | 13355 | 22748 |

**Notes:** This table reports coefficients testing whether discontinuities exist in the probability individuals ever reach the credentialling outcomes listed in each row (Panels A and B) or retakes that subtest (Panels C and D). RD models include all demographic covariates listed in Panel A of Table 1 and their corresponding missing data indicators, as well as fixed effects for quarter of first GED® subject test attempt and state of residence. Distance from each threshold is modeled as a linear function with triangular kernel weights and separate slopes above and below the threshold, as in Equations (1) and (2). Bandwidth varies by outcome and subject test threshold, determined using the optimal bandwidth calculations described in Calonico et al. (2019). $^{*} = p < 0.1$, $^{**} = p < 0.05$, $^{***} = p < 0.01$.

Table 4: RD estimates of impacts on college outcomes (ITT)

| | Mathematical Reasoning (1) | Reasoning thru. ELA (2) | Science (3) | Social Studies (4) |
|---|---|---|---|---|
| A. Impact of crossing GED® CR threshold | | | | |
| Enrolled within 2 years | .009 | -.008 | .007 | .063 |
| | (.054) | (.036) | (.027) | (.078) |
| | 2048 | 3781 | 6050 | 2887 |
| Persisted $\geq$ 1.5 years | -.005 | -.007 | .013 | .044 |
| | (.045) | (.026) | (.021) | (.038) |
| | 2048 | 3781 | 4389 | 3782 |
| B. Impact of crossing GED® CR+C threshold by subject | | | | |
| Enrolled within 2 years | .106 | .014 | .146 | -.100* |
| | (.225) | (.062) | (.106) | (.053) |
| | 369 | 1338 | 824 | 1701 |
| Persisted $\geq$ 1.5 years | -.033 | .004 | -.053 | -.089** |
| | (.181) | (.059) | (.108) | (.040) |
| | 369 | 997 | 761 | 1701 |

**Notes:** This table reports coefficients testing whether discontinuities exist in the probability individuals ever achieve the college outcomes indicated in each row. RD models include all demographic covariates listed in Panel A of Table 1 and their corresponding missing data indicators, as well as fixed effects for quarter of first GED® subject test attempt and state of residence. Distance from each threshold is modeled as a linear function with triangular kernel weights and separate slopes above and below the threshold, as in Equation (2). Bandwidth varies by outcome and subject test threshold, determined using the optimal bandwidth calculations described in Calonico et al. (2019). $^{*} = p < 0.1$, $^{**} = p < 0.05$, $^{***} = p < 0.01$.

Table 5: RD estimates of impacts on college enrollment by quarter since 1st GED® subject test attempt

| | RD estimates by subject (GED® CR threshold) | | | | RD estimates by subject (GED® CR+C threshold) | | | |
|---|---|---|---|---|---|---|---|---|
| Quarter Since 1st GED® Attempt | Mathematical Reasoning (1) | Reasoning Thru. ELA (2) | Science (3) | Soc. Stud. (4) | Mathematical Reasoning (5) | Reasoning Thru. ELA (6) | Science (7) | Soc. Stud. (8) |
| 0 (Q of 1st test) | -.016 | .012 | .012 | .043 | .064 | .041 | .061 | -.051 |
| | (.035) | (.019) | (.015) | (.039) | (.060) | (.049) | (.066) | (.033) |
| | 2048 | 3781 | 6050 | 2887 | 771 | 997 | 824 | 1244 |
| 1 | .042 | -.017 | .026 | .079 | .031 | .027 | .024 | -.050 |
| | (.044) | (.028) | (.020) | (.055) | (.194) | (.049) | (.109) | (.036) |
| | 2048 | 3781 | 6050 | 2887 | 369 | 1338 | 761 | 1701 |
| 2 | .059 | -.016 | -.008 | .094 | .131 | .046 | -.011 | -.050 |
| | (.044) | (.031) | (.023) | (.063) | (.126) | (.055) | (.115) | (.040) |
| | 2048 | 3781 | 6050 | 2887 | 490 | 1338 | 761 | 1701 |
| 3 | .030 | -.016 | .008 | .127** | .102 | .011 | -.005 | -.043 |
| | (.046) | (.032) | (.022) | (.064) | (.189) | (.064) | (.115) | (.039) |
| | 2048 | 3781 | 6050 | 2887 | 369 | 997 | 761 | 2198 |
| 4 | -.049 | -.043 | .024 | .076 | .075 | -.05 | .086 | -.032 |
| | (.051) | (.031) | (.025) | (.064) | (.196) | (.065) | (.114) | (.039) |
| | 2048 | 3781 | 4389 | 2887 | 369 | 997 | 761 | 2198 |
| 5 | -.015 | -.027 | .019 | .059 | -.101 | .031 | .046 | -.039 |
| | (.049) | (.031) | (.025) | (.049) | (.129) | (.053) | (.112) | (.041) |
| | 2048 | 3781 | 4389 | 3782 | 490 | 1338 | 761 | 1701 |
| 6 | -.064 | -.008 | .020 | .062 | -.14 | .087 | .024 | -.074* |
| | (.061) | (.027) | (.024) | (.061) | (.129) | (.064) | (.108) | (.041) |
| | 1612 | 4916 | 6050 | 2887 | 490 | 997 | 761 | 1701 |
| 7 | .065 | -.015 | .016 | .071 | .104 | .037 | .056 | -.039 |
| | (.047) | (.029) | (.022) | (.064) | (.18) | (.063) | (.102) | (.038) |
| | 1909 | 3484 | 5667 | 2683 | 335 | 909 | 752 | 2030 |
| 8 | .059 | .001 | .020 | -.016 | .222 | -.045 | .019 | -.086** |
| | (.049) | (.029) | (.022) | (.074) | (.186) | (.056) | (.136) | (.039) |
| Observations | 1709 | 3157 | 5184 | 2416 | 301 | 1085 | 624 | 1833 |

**Notes:** This table reports coefficients testing whether discontinuities exist in the probability individuals were enrolled in college in the quarter listed in each row (relative to the quarter in which they took their first GED® subject test). The left half of the table reports estimated discontinuities at the indicated GED® CR thresholds, while the right half reports estimated discontinuities at the indicated GED® CR+C thresholds. RD models include all demographic covariates listed in Panel A of Table 1 and their corresponding missing data indicators, as well as fixed effects for quarter of first GED® subject test attempt and state of residence. Distance from each threshold is modeled as a quadratic function with separate slopes above and below the threshold. Bandwidth varies by outcome and subject test threshold, determined using the optimal bandwidth calculations described in Calonico et al. (2019). $^{*} = p < 0.1$, $^{**} = p < 0.05$, $^{***} = p < 0.01$.

Table 6a: Impact on college outcomes by subgroup, GED® CR thresholds

| Subject | Outcome | Male (1) | Female (2) | URM (3) | Not URM (4) | Above Median ACE (5) | Below Median ACE (6) | Motivation Education (7) | Motivation Other (8) |
|---|---|---|---|---|---|---|---|---|---|
| Math | Enrolled within 2 years | -.047 | .08 | .006 | .036 | .009 | .007 | .021 | .044 |
| | | (.071) | (.096) | (.129) | (.069) | (.088) | (.069) | (.075) | (.074) |
| | | 1179 | 717 | 376 | 1296 | 841 | 1207 | 1172 | 857 |
| Math | Persisted $\geq$ 1.5 years | -.071 | .089 | -.152 | .035 | -.01 | .005 | -.063 | .081* |
| | | (.056) | (.089) | (.117) | (.057) | (.071) | (.06) | (.071) | (.044) |
| | | 1179 | 717 | 376 | 1296 | 841 | 1207 | 1172 | 857 |
| ELA | Enrolled within 2 years | -.033 | .011 | -.096 | 0 | -.050 | .021 | -.021 | .022 |
| | | (.05) | (.06) | (.088) | (.044) | (.056) | (.047) | (.052) | (.047) |
| | | 1948 | 1595 | 686 | 2434 | 1549 | 2232 | 2029 | 1733 |
| ELA | Persisted $\geq$ 1.5 years | -.014 | .010 | -.035 | -.024 | -.057 | .028 | -.038 | .030 |
| | | (.035) | (.043) | (.066) | (.031) | (.040) | (.034) | (.042) | (.028) |
| | | 1948 | 1595 | 686 | 2434 | 1549 | 2232 | 2029 | 1733 |
| Science | Enrolled within 2 years | -.029 | .057 | .013 | .013 | -.073* | .062*+ | .022 | -.006 |
| | | (.035) | (.047) | (.065) | (.034) | (.041) | (.036) | (.04) | (.034) |
| | | 3431 | 2245 | 1110 | 3904 | 2505 | 3545 | 3206 | 2813 |
| Science | Persisted $\geq$ 1.5 years | -.022 | .069* | -.022 | .022 | 0 | .023 | .013 | .021 |
| | | (.026) | (.039) | (.051) | (.026) | (.032) | (.028) | (.035) | (.02) |
| | | 2479 | 1645 | 790 | 2847 | 1827 | 2562 | 2334 | 2029 |
| Soc. Stud. | Enrolled within 2 years | .033 | .225 | .027 | .055 | .026 | .091 | .073 | .019 |
| | | (.101) | (.137) | (.194) | (.102) | (.118) | (.107) | (.117) | (.094) |
| | | 1629 | 1102 | 619 | 1798 | 1187 | 1700 | 1525 | 1344 |
| Soc. Stud. | Persisted $\geq$ 1.5 years | .053 | .061 | -.043 | .06 | .013 | .076 | .032 | .04 |
| | | (.045) | (.072) | (.097) | (.047) | (.06) | (.049) | (.066) | (.033) |
| Observations | | 2152 | 1421 | 801 | 2364 | 1557 | 2225 | 2006 | 1756 |

**Notes:** This table reports coefficients testing whether discontinuities exist in the probability individuals ever achieve the college outcomes indicated in each row for the subgroups indicated in each column at the GED® CR threshold indicated in each row. RD models include all demographic covariates listed in Panel A of Table 1 and their corresponding missing data indicators as well as fixed effects for quarter of first GED® subject test attempt and state of residence. Distance from each threshold is modeled as a linear function with triangular kernel weights and separate slopes above and below the threshold, as in Equation (2). Bandwidth varies by outcome and subject test threshold, determined using the optimal bandwidth calculations described in Calonico et al. (2019). $^{*} = p < 0.1$, $^{**} = p < 0.05$, $^{***} = p < 0.01$.

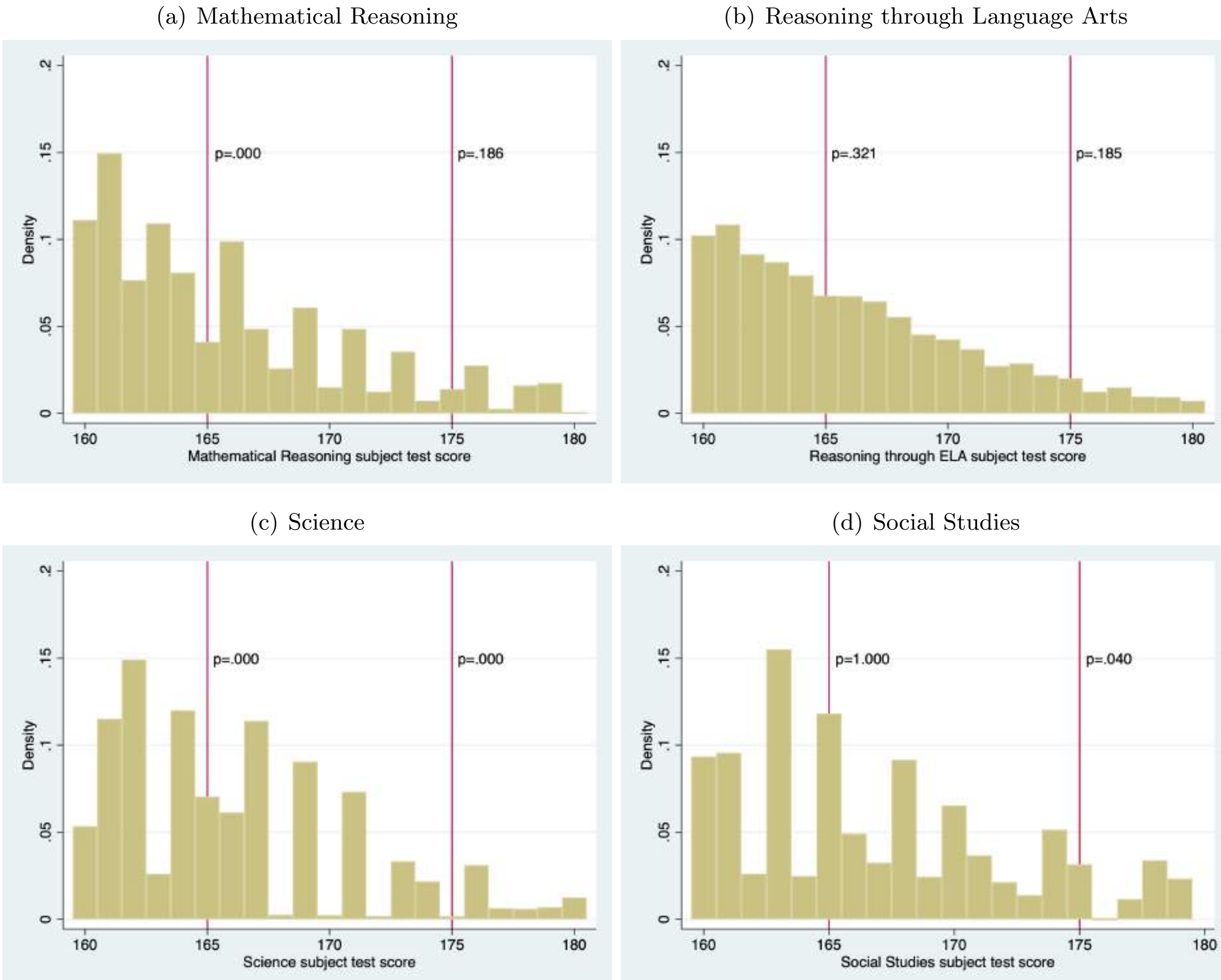
Table 6b: Impact on college outcomes by subgroup, GED® CR+C thresholds

| Subject | Outcome | Male (1) | Female (2) | URM (3) | Not URM (4) | Above Median ACE (5) | Below Median ACE (6) | Motivation Education (7) | Motivation Other (8) |
|---|---|---|---|---|---|---|---|---|---|
| Math | Enrolled within 2 years | .231 | .203 | .622 | .074 | .980*** | -.329+ | .104 | -.141 |
| | | (.283) | (.382) | (1.008) | (.336) | (.348) | (.267) | (.295) | (.298) |
| | | 220 | 120 | 60 | 243 | 141 | 228 | 234 | 134 |
| Math | Persisted $\geq$ 1.5 years | -.008 | .086 | -.264 | -.225 | .190 | -.265 | -.207 | -.065 |
| | | (.236) | (.368) | (.570) | (.263) | (.306) | (.244) | (.261) | (.270) |
| | | 220 | 120 | 60 | 243 | 141 | 228 | 234 | 134 |
| ELA | Enrolled within 2 years | .071 | -.042 | .125 | .089 | -.040 | .078 | -.015 | -.056 |
| | | (.09) | (.097) | (.176) | (.076) | (.097) | (.080) | (.082) | (.085) |
| | | 679 | 545 | 182 | 895 | 562 | 776 | 786 | 549 |
| ELA | Persisted $\geq$ 1.5 years | .137* | -.116+ | .227 | .077 | -.163* | .125*+ | .048 | -.139** |
| | | (.076) | (.102) | (.162) | (.071) | (.096) | (.075) | (.089) | (.069) |
| | | 495 | 418 | 136 | 660 | 422 | 575 | 592 | 403 |
| Science | Enrolled within 2 years | .102 | .360* | .622* | .005+ | .082 | .175 | .116 | .163 |
| | | (.135) | (.192) | (.345) | (.132) | (.165) | (.146) | (.148) | (.144) |
| | | 515 | 238 | 101 | 553 | 330 | 494 | 489 | 333 |
| Science | Persisted $\geq$ 1.5 years | -.072 | .192 | .342 | -.117 | -.01 | -.034 | -.036 | -.112 |
| | | (.130) | (.203) | (.371) | (.131) | (.182) | (.133) | (.165) | (.118) |
| | | 477 | 217 | 91 | 510 | 301 | 460 | 451 | 308 |
| Soc. Stud. | Enrolled within 2 years | -.115* | -.021 | -.172 | -.019 | -.186** | -.028 | -.160** | -.050 |
| | | (.070) | (.098) | (.165) | (.066) | (.082) | (.071) | (.075) | (.073) |
| | | 1016 | 532 | 233 | 1121 | 699 | 1002 | 951 | 743 |
| Soc. Stud. | Persisted $\geq$ 1.5 years | -.114** | -.013 | -.014 | -.053 | -.073 | -.110** | -.153** | -.044 |
| | | (.050) | (.079) | (.108) | (.050) | (.062) | (.052) | (.063) | (.044) |
| Observations | | 1016 | 532 | 233 | 1121 | 699 | 1002 | 951 | 743 |

**Notes:** This table reports coefficients testing whether discontinuities exist in the probability individuals ever achieve the college outcomes indicated in each row for the subgroups indicated in each column at the GED® CR+C threshold indicated in each row. RD models include all demographic covariates listed in Panel A of Table 1 and their corresponding missing data indicators, as well as fixed effects for quarter of first GED® subject test attempt and state of residence. Distance from each threshold is modeled as a linear function with triangular kernel weights and separate slopes above and below the threshold, as in Equation (2). Bandwidth varies by outcome and subject test threshold, determined using the optimal bandwidth calculations described in Calonico et al. (2019). $^{*} = p < 0.1$, $^{**} = p < 0.05$, $^{***} = p < 0.01$.

# Appendix Figures

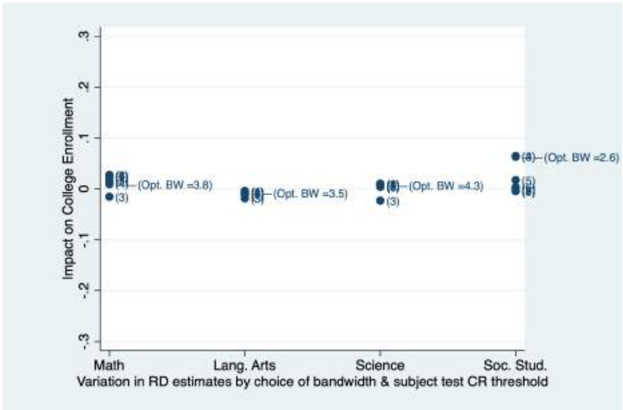
Appendix Figure 1: Observation density by subject test score



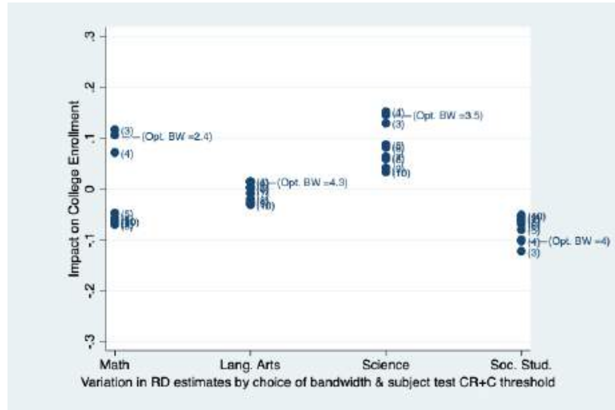

**Notes:** Each histogram plots the discrete density of score observations in each GED® subject test. Scores are restricted to an individual's first attempt of each subject test. Red lines mark the minimum scores required to earn the GED® CR (165) and GED® CR+C (175) designations. P-values beside each threshold report the results of a test for the smoothness of the density function, accounting for the discreteness of the distribution using the methods described in Frandsen (2017) with the bound coefficient set to $k = 0.05$.

Appendix Figure 2: RD estimates using alternative bandwidths

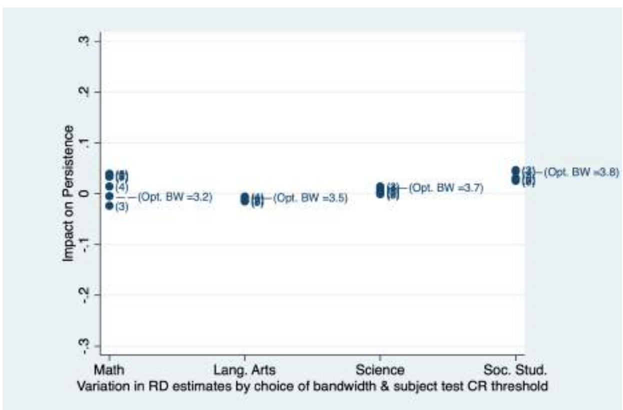
(a) GED® CR, Enrollment



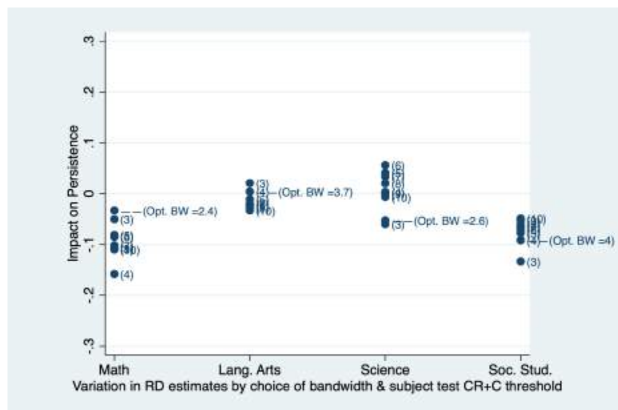

(b) GED® CR+C, Enrollment




(c) GED® CR, Persistence



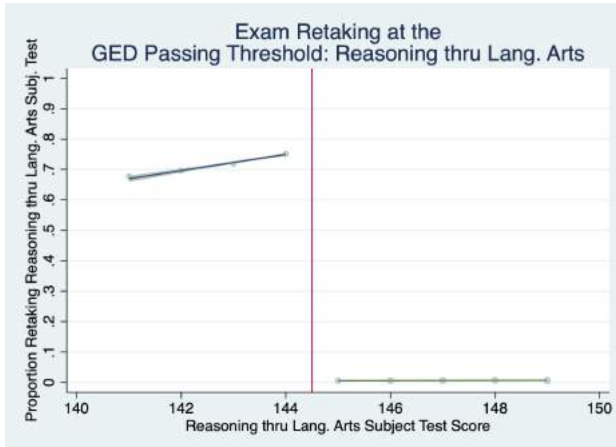

(d) GED® CR+C, Persistence



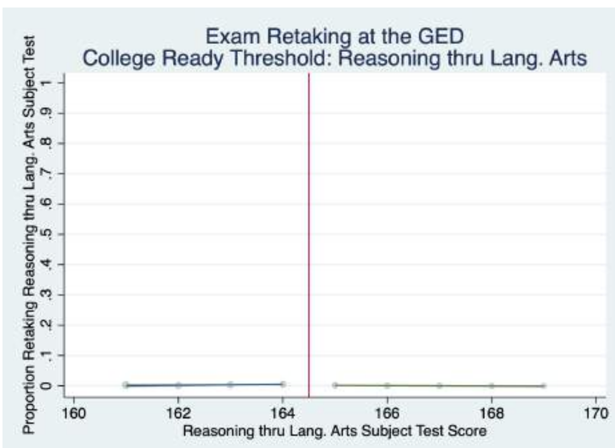

**Notes:** Each graph plots coefficients for the RD estimates from Table 4 using the optimal bandwidth, as well as RD estimates using all possible symmetric integer bandwidths between 3 and 9 (GED® CR) or between 3 and 10 (GED® CR+C). Bandwiths are reported in parentheses next to each point estimate. RD models include all demographic covariates listed in Panel A of Table 1 and their corresponding missing data indicators, as well as fixed effects for quarter of first GED® subject test attempt and state of residence. Distance from each threshold is modeled as a linear function with triangular kernel weights and separate slopes above and below the threshold, as in Equation (2).

Appendix Figure 3: RD plots, subject test retaking by threshold (Reasoning through Lang. Arts)

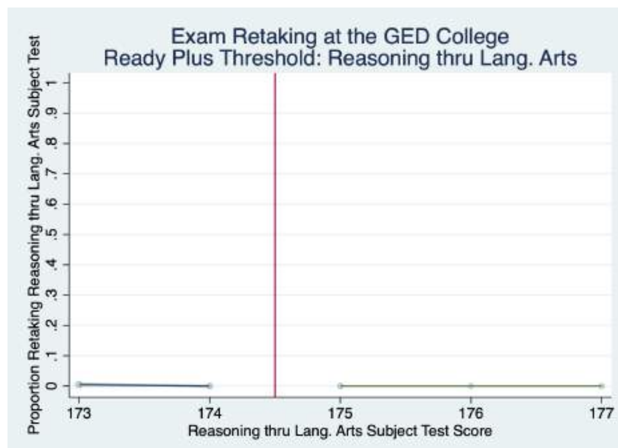
(a) Passing Threshold




(b) GED® CR Threshold

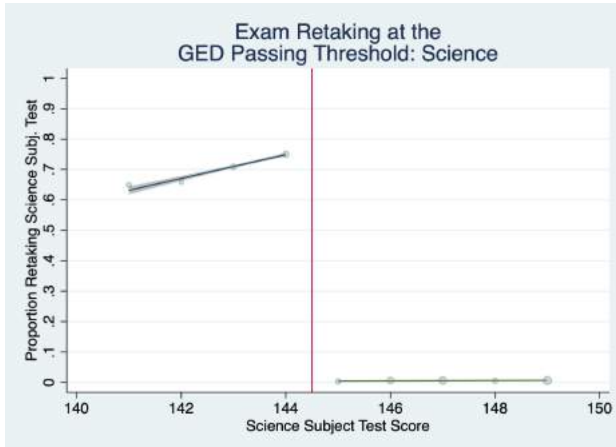



(c) GED® CR+C Threshold

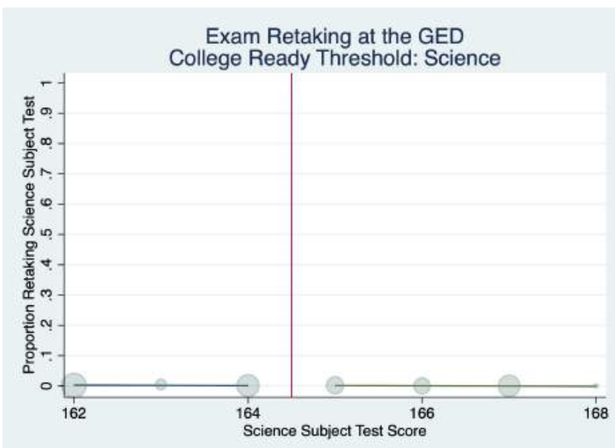


Appendix Figure 3 (cont'): RD plots, subject test retaking by threshold (Science)

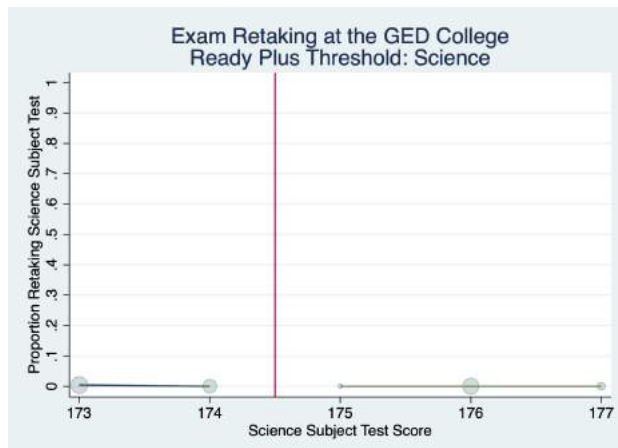
(d) Passing Threshold




(e) GED® CR Threshold

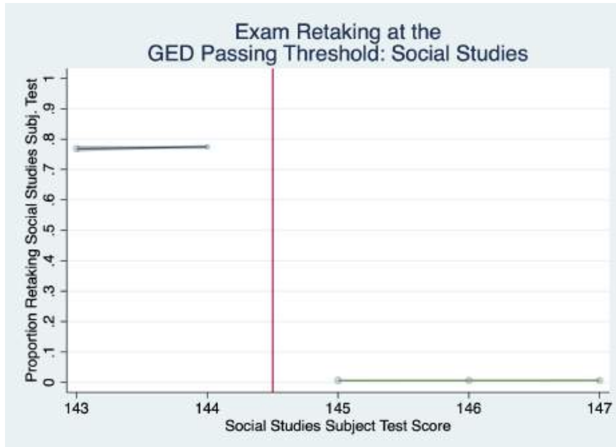



(f) GED® CR+C Threshold

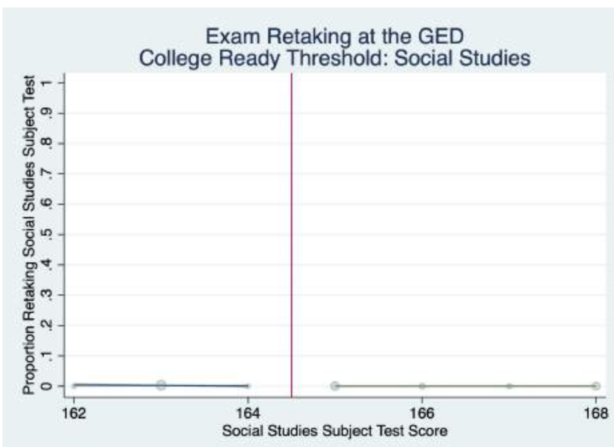


Appendix Figure 3 (cont'): RD plots, subject test retaking by threshold (Social Studies)

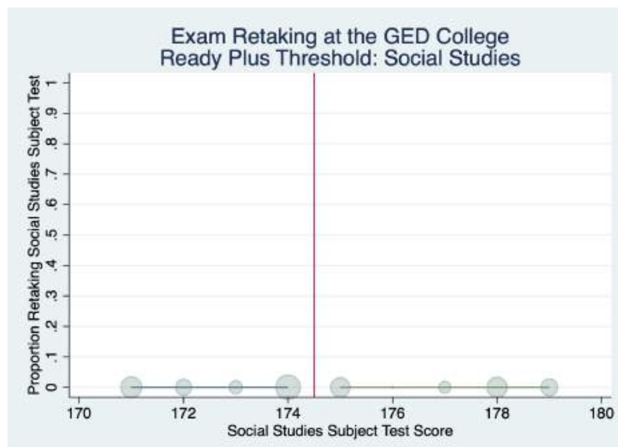
(g) Passing Threshold




(h) GED® CR Threshold




(i) GED® CR+C Threshold




**Notes:** Each graph plots rates of exam retaking above and below the indicated GED® subject test score thresholds, as well as lines of best fit and 95% confidence interval on either side of the threshold. Exam retaking is a binary variable that takes on the value 1 if an individual was observed taking a GED® subject test in the indicated content area more than once and zero otherwise. Bandwidth and effective sample size vary by subject test threshold, determined using the optimal bandwidth calculations described in Calonico et al. (2019); see panel D of Table 3 for the effective number of observations that contribute to each estimate. Distance from each threshold is modeled as a linear function with triangular kernel weights and separate slopes above and below each threshold, as in Equation (2). Points are scaled relative to the size of the sample that earned that subject test score.

# Appendix Tables

Appendix Table 1: GED® Counts by Year

| | Attempted At Least 1 Subj. Test (1) | Completed All 4 Subj. Tests (2) | Passed All 4 (145+) (3) | Passed All 4 (150+) (4) | Passed All 4 At Time (5) |
|---|---|---|---|---|---|
| 2014 | 172,258 | 98,434 | 72,955 | 58,481 | 58,481 |
| 2015 | 244,193 | 138,917 | 112,660 | 90,824 | 90,824 |
| 2016 | 302,169 | 193,351 | 153,673 | 69,248 | 151,117 |
| 2017 | 299,727 | 192,527 | 151,175 | 66,000 | 151,175 |
| 2018 | 299,668 | 193,406 | 154,956 | 64,397 | 154,956 |
| 2019 | 291,057 | 183,779 | 145,082 | 63,163 | 145,082 |

**Note:** Cells record the number of GED® testers who met the criteria described in each column in the year listed in each row. Individuals who attempted subject tests in multiple years are counted as having attempted at least 1 subject test in each year they take a subject test. Individuals who complete all four subject tests are only recorded as completers until they cross the indicated passing threshold for the first time, and individuals who pass all four subject tests are only counted as passing the indicated threshold in the first year they pass that threshold in all four subject tests (i.e., the small number of testers who retake a subject test in subsequent years after passing all four subject tests are recorded as attempting at least 1 subject test in that year, but not as completing or passing the exam in subsequent years). Columns (3) and (4) record the number of people who passed all four subject tests with a minimum score of 145 or 150 for the first time in that year (including retakes). Column (5) records the number of people who met the relevant passing criteria at the time they took the GED® exam. Note that this count corresponds to the counts in column (3) or column (4) for all years except 2016, when the passing standard was revised on January 26. For 2016, testers whose last subject test attempt occured before January 26 are recorded as being subject to the 150 passing standard, while individuals who took their last subject test after January 26 are recorded as being subject to the revised 145 passing standard. N=1,258,509.

Appendix Table 2: Percent of testers meeting college readiness subject test score thresholds

| Subject Test | GED® CR | GED® CR+C |
|---|---|---|
| Mathematical Reasoning | 7.26% | 2.00% |
| Reasoning through Lang. Arts | 12.66% | 2.22% |
| Science | 13.41% | 1.98% |
| Social Studies | 16.03% | 4.17% |
| Any Subject | 22.37% | 6.05% |

**Note:** N=644,615.

Appendix Table 3: GED CR, CR+C, and Honors Counts by Year

| | 2014 (1) | 2015 (2) | 2016 (3) | 2017 (4) | 2018 (5) | 2019 (6) |
|---|---|---|---|---|---|---|
| A. GED College Ready or higher (Subject Test Score = 165+) | | | | | | |
| Mathematical Reasoning | 7942 | 12312 | 11797 | 10814 | 10520 | 10414 |
| Reasoning through Lang. Arts | 23171 | 24326 | 19737 | 20508 | 21596 | 20553 |
| Science | 13466 | 18175 | 23102 | 22136 | 20827 | 17264 |
| Social Studies | 18672 | 23419 | 29345 | 27799 | 26233 | 24275 |
| Any Subject | 34392 | 43383 | 46428 | 45902 | 44668 | 41238 |
| B. GED College Ready Plus Credits (175+) | | | | | | |
| Mathematical Reasoning | 1786 | 2583 | 3119 | 2459 | 2911 | 2935 |
| Reasoning through Lang. Arts | 3479 | 3382 | 3199 | 3503 | 3765 | 3329 |
| Science | 1873 | 2432 | 3407 | 3072 | 2808 | 2418 |
| Social Studies | 4493 | 5316 | 7464 | 6229 | 5780 | 7403 |
| Any Subject | 7779 | 9262 | 11746 | 10838 | 10813 | 11505 |

**Note:** Cells report the number of individuals who met the minimum requirements for the designation described in each panel in the subject and year described in the corresponding row and column. Note that the GED® College Ready and College Ready Plus Credits designations were not awarded until January 26, 2016. Between January 1, 2014 and January 25, 2016, testers who achieved a score of at least 170 in a given subject test earned a GED® Honors designation. N=1,258,509.

Appendix Table 4: RD estimates using alternative local polynomial trends

| | Trend | Mathematical Reasoning (1) | Reasoning Thru. ELA (2) | Science (3) | Soc. Stud. (4) |
|---|---|---|---|---|---|
| A. Impact of crossing GED® CR threshold by subject | | | | | |
| Enrolled within 2 years | Linear | .009 | -.008 | .007 | .063 |
| | | (.054) | (.036) | (.027) | (.078) |
| | | 2048 | 3781 | 6050 | 2887 |
| Enrolled within 2 years | Quadratic | -.003 | -.028 | -.007 | .100 |
| | | (.087) | (.086) | (.05) | (.128) |
| | | 2943 | 3781 | 6050 | 3782 |
| Enrolled within 2 years | Cubic | -.010 | -.051 | -.259 | .108 |
| | | (.208) | (.157) | (.177) | (.229) |
| | | 2943 | 4916 | 4389 | 4694 |
| Peristed $\geq$ 1.5 years | Linear | -.005 | -.007 | .013 | .044 |
| | | (.045) | (.026) | (.021) | (.038) |
| | | 2048 | 3781 | 4389 | 3782 |
| Peristed $\geq$ 1.5 years | Quadratic | -.069 | .003 | .014 | .050 |
| | | (.085) | (.043) | (.034) | (.084) |
| | | 2048 | 4916 | 6050 | 3782 |
| Peristed $\geq$ 1.5 years | Cubic | -.140 | -.045 | -.097 | .034 |
| | | (.150) | (.114) | (.128) | (.154) |
| | | 2943 | 4916 | 4389 | 4694 |
| B. Impact of crossing GED® CR+C threshold | | | | | |
| Enrolled within 2 years | Linear | .106 | .014 | .146 | -.100* |
| | | (.225) | (.062) | (.106) | (.053) |
| | | 369 | 1338 | 824 | 1701 |
| Enrolled within 2 years | Quadratic | .176 | .014 | .173 | -.113 |
| | | (.354) | (.118) | (.141) | (.071) |
| | | 490 | 1338 | 1591 | 2198 |
| Enrolled within 2 years | Cubic | -.818 | .001 | -.451 | -.096 |
| | | (.684) | (.303) | (.400) | (.137) |
| | | 490 | 1338 | 1591 | 2383 |
| Peristed $\geq$ 1.5 years | Linear | -.033 | .004 | -.053 | -.089** |
| | | (.181) | (.059) | (.108) | (.040) |
| | | 369 | 997 | 761 | 1701 |
| Peristed $\geq$ 1.5 years | Quadratic | .051 | .061 | -.446** | -.104** |
| | | (.311) | (.133) | (.210) | (.052) |
| | | 490 | 1338 | 824 | 2198 |
| Peristed $\geq$ 1.5 years | Cubic | .424 | .102 | -1.32** | -.130 |
| | | (.534) | (.252) | (.563) | (.097) |
| Observations | | 771 | 1338 | 1471 | 2383 |

**Notes:** This table re-estimates the main results from Table 4 varying the degree of the local polynomial used to model the relationship between the outcomes of interest and the running variable on either side of each GED® college readiness threshold. The "Trend" column indicates the functional form of the local polynomial used to generate each set of RD estimates. $^{*} = p < 0.1$, $^{**} = p < 0.05$, $^{***} = p < 0.01$.

Appendix Table 5: RD estimates using alternative covariate sets

| | Covariates | Mathematical Reasoning (1) | Reasoning Thru. ELA (2) | Science (3) | Soc. Stud. (4) |
|---|---|---|---|---|---|
| A. Impact of crossing GED® CR threshold by subject | | | | | |
| Enrolled within 2 years | None | .007 | -.013 | -.004 | .081 |
| | | (.054) | (.037) | (.028) | (.077) |
| Enrolled within 2 years | Demographics | .009 | -.008 | .007 | .063 |
| | | (.054) | (.036) | (.027) | (.078) |
| Enrolled within 2 years | All baseline chars | .021 | .001 | .013 | .048 |
| | | (.052) | (.035) | (.026) | (.076) |
| Persist $\geq$ 1.5 years | None | -.010 | -.013 | .007 | .052 |
| | | (.046) | (.026) | (.022) | (.038) |
| Persist $\geq$ 1.5 years | Demographics | -.005 | -.007 | .013 | .044 |
| | | (.045) | (.026) | (.021) | (.038) |
| Persist $\geq$ 1.5 years | All baseline chars | -.001 | -.002 | .016 | .034 |
| | | (.044) | (.025) | (.021) | (.038) |
| | | 2048 | 3781 | 4389 | 3782 |
| B. Impact of crossing GED® CR+C threshold by subject | | | | | |
| Enrolled within 2 years | None | .020 | .007 | .135 | -.098* |
| | | (.222) | (.063) | (.105) | (.054) |
| Enrolled within 2 years | Demographics | .106 | .014 | .146 | -.100* |
| | | (.225) | (.062) | (.106) | (.053) |
| Enrolled within 2 years | All baseline chars | -.001 | -.025 | .167 | -.089* |
| | | (.214) | (.059) | (.104) | (.052) |
| Persist $\geq$ 1.5 years | None | -.063 | .002 | -.044 | -.088** |
| | | (.187) | (.060) | (.106) | (.039) |
| Persist $\geq$ 1.5 years | Demographics | -.033 | .004 | -.053 | -.089** |
| | | (.181) | (.059) | (.108) | (.040) |
| Persist $\geq$ 1.5 years | All baseline chars | -.061 | -.024 | -.069 | -.072* |
| | | (.176) | (.057) | (.108) | (.038) |
| Observations | | 369 | 997 | 761 | 1701 |

**Notes:** This table re-estimates the main results from Table 4 varying the set of covariates included in the RD model. The "Covariates" column indicates which covariates were included to generate for each set of RD estimates. "Demographics" includes all covariates in Panel A of Table 1 as well as their corresponding missing data indicators. "All baseline chars" includes all covariates in Panels A, B, and C of Table 1. $^{*} = p < 0.1$, $^{**} = p < 0.05$, $^{***} = p < 0.01$.

Appendix Table 6: Robust and Bias-Corrected RD estimates

| Outcome | Method | Mathematical Reasoning (1) | Reasoning Thru. ELA (2) | Science (3) | Social Studies (4) |
|---|---|---|---|---|---|
| A. Impact of crossing GED® CR threshold by subject | | | | | |
| Enrolled within 2 years | Conventional | .009 | -.008 | .007 | .063 |
| | | (.050) | (.035) | (.027) | (.072) |
| | | 2048 | 3781 | 6050 | 2887 |
| Enrolled within 2 years | Bias-Corrected | .002 | -.001 | .005 | .082 |
| | | (.050) | (.035) | (.027) | (.072) |
| | | 2048 | 3781 | 6050 | 2887 |
| Enrolled within 2 years | Robust Bias-Corrected | .002 | -.001 | .005 | .082 |
| | | (.062) | (.047) | (.035) | (.087) |
| | | 2048 | 3781 | 6050 | 2887 |
| Persisted $\geq$ 1.5 years | Conventional | -.005 | -.007 | .013 | .044 |
| | | (.041) | (.026) | (.021) | (.037) |
| | | 2048 | 3781 | 4389 | 3782 |
| Persisted $\geq$ 1.5 years | Bias-Corrected | -.020 | -.001 | .015 | .049 |
| | | (.041) | (.026) | (.021) | (.037) |
| | | 2048 | 3781 | 4389 | 3782 |
| Persisted $\geq$ 1.5 years | Robust Bias-Corrected | -.020 | -.001 | .015 | .049 |
| | | (.052) | (.035) | (.028) | (.045) |
| | | 2048 | 3781 | 4389 | 3782 |
| B. Impact of crossing GED® CR+C threshold by subject | | | | | |
| Enrolled within 2 years | Conventional | .106 | .014 | .146 | -.100** |
| | | (.176) | (.059) | (.092) | (.049) |
| | | 369 | 1338 | 824 | 1701 |
| Enrolled within 2 years | Bias-Corrected | .169 | .033 | .173* | -.116** |
| | | (.176) | (.059) | (.092) | (.049) |
| | | 369 | 1338 | 824 | 1701 |
| Enrolled within 2 years | Robust Bias-Corrected | .169 | .033 | .173 | -.116** |
| | | (.212) | (.074) | (.110) | (.058) |
| | | 369 | 1338 | 824 | 1244 |
| Persisted $\geq$ 1.5 years | Conventional | -.033 | -.004 | -.053 | -.089** |
| | | (.138) | (.055) | (.094) | (.037) |
| | | 369 | 997 | 761 | 1701 |
| Persisted $\geq$ 1.5 years | Bias-Corrected | -.017 | .014 | -.096 | -.099*** |
| | | (.138) | (.055) | (.094) | (.037) |
| | | 369 | 997 | 761 | 1701 |
| Persisted $\geq$ 1.5 years | Robust Bias-Corrected | -.017 | .014 | -.096 | -.099** |
| | | (.170) | (.069) | (.116) | (.043) |
| Observations | | 369 | 997 | 761 | 1701 |

**Notes:** This table re-estimates the main results from Table 4 using the robust, bias-corrected local polynomial methods described in Calonico et al. (2019). Local linear regression is used to construct the point estimator. Local quadratic regression is used to construct the bias correction. $^{*} = p < 0.1$, $^{**} = p < 0.05$, $^{***} = p < 0.01$.

Appendix Table 7a: RD estimates using alternative bandwidths (Enrollment)

| | | | Bandwith | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Subject | Threshold | Outcome | Optimal | bw=2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Math | CR (165) | Enrolled within 2 years | .009 | -.015 | .011 | .017 | .026 | .028 | .027 | .023 | .024 |
| | | | (.054) | (.071) | (.053) | (.04) | (.036) | (.033) | (.03) | (.028) | (.027) |
| | | | 2048 | 1612 | 2048 | 2943 | 3480 | 4147 | 5067 | 6052 | 7153 |
| Math | CR+C (175) | Enrolled within 2 years | .106 | .117 | .071 | -.047 | -.057 | -.064 | -.07 | -.067 | -.063 |
| | | | (.225) | (.22) | (.142) | (.09) | (.083) | (.07) | (.064) | (.059) | (.054) |
| | | | 369 | 369 | 490 | 771 | 837 | 1099 | 1305 | 1527 | 1952 |
| ELA | CR (165) | Enrolled within 2 years | -.008 | -.019 | -.004 | -.005 | -.01 | -.011 | -.008 | -.009 | -.012 |
| | | | (.036) | (.047) | (.035) | (.029) | (.026) | (.024) | (.022) | (.021) | (.02) |
| | | | 3781 | 2697 | 3781 | 4916 | 5985 | 6993 | 8004 | 8991 | 9872 |
| ELA | CR+C (175) | Enrolled within 2 years | .014 | .003 | .014 | .015 | .002 | -.008 | -.02 | -.027 | -.031 |
| | | | (.062) | (.096) | (.071) | (.058) | (.051) | (.047) | (.044) | (.041) | (.039) |
| | | | 1338 | 725 | 997 | 1338 | 1705 | 2089 | 2533 | 3047 | 3562 |
| Science | CR (165) | Enrolled within 2 years | .007 | -.023 | .009 | .006 | .004 | .007 | .01 | .01 | .012 |
| | | | (.027) | (.05) | (.03) | (.026) | (.025) | (.022) | (.02) | (.019) | (.018) |
| | | | 6050 | 3164 | 4389 | 6050 | 6501 | 8262 | 9336 | 10274 | 11050 |
| Science | CR+C (175) | Enrolled within 2 years | .146 | .129 | .152 | .087 | .082 | .064 | .059 | .042 | .034 |
| | | | (.106) | (.129) | (.104) | (.062) | (.057) | (.05) | (.048) | (.044) | (.042) |
| | | | 824 | 761 | 824 | 1471 | 1591 | 2325 | 2405 | 3336 | 3832 |
| Soc. Stud. | CR (165) | Enrolled within 2 years | .063 | .064 | .065 | .017 | .003 | -.003 | -.002 | -.004 | -.005 |
| | | | (.078) | (.078) | (.056) | (.033) | (.027) | (.025) | (.023) | (.021) | (.02) |
| | | | 2887 | 2887 | 3782 | 4694 | 5902 | 6846 | 7760 | 8535 | 9666 |
| Soc. Stud. | CR+C (175) | Enrolled within 2 years | -.1* | -.122 | -.103* | -.08* | -.069 | -.059 | -.063 | -.055 | -.051 |
| | | | (.053) | (.086) | (.056) | (.046) | (.042) | (.042) | (.039) | (.036) | (.035) |
| | | | 1701 | 824 | 1244 | 1701 | 2198 | 2383 | 3105 | 3558 | 4031 |

**Notes:** This table reports the main enrollment estimates from Table 4 at GED® CR or GED® CR+C subject test threshold indicated in each row using the optimal bandwidth, as well as RD estimates using all possible symmetric integer bandwidths between 2 and 9 points in the indicated columns. $^{*} = p < 0.1$, $^{**} = p < 0.05$, $^{***} = p < 0.01$.

Appendix Table 7b: RD estimates using alternative bandwidths (Persistence)

| | | | Bandwith | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Subject | Threshold | Outcome | Optimal | bw=2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Math | CR (165) | Persisted $\geq$ 1.5 years | -.005 | -.024 | .014 | .035 | .039 | .033 | .036 | .037* | .036* |
| | | | (.045) | (.053) | (.04) | (.031) | (.028) | (.025) | (.023) | (.022) | (.021) |
| | | | 2048 | 1612 | 2048 | 2943 | 3480 | 4147 | 5067 | 6052 | 7153 |
| Math | CR+C (175) | Persisted $\geq$ 1.5 years | -.033 | -.05 | -.158 | -.081 | -.085 | -.102* | -.109** | -.107** | -.11** |
| | | | (.181) | (.182) | (.118) | (.077) | (.071) | (.06) | (.054) | (.05) | (.046) |
| | | | 369 | 369 | 490 | 771 | 837 | 1099 | 1305 | 1527 | 1952 |
| ELA | CR (165) | Persisted $\geq$ 1.5 years | -.007 | -.009 | -.006 | -.014 | -.015 | -.014 | -.013 | -.015 | -.018 |
| | | | (.026) | (.034) | (.025) | (.021) | (.019) | (.017) | (.016) | (.015) | (.014) |
| | | | 3781 | 2697 | 3781 | 4916 | 5985 | 6993 | 8004 | 8991 | 9872 |
| ELA | CR+C (175) | Persisted $\geq$ 1.5 years | .004 | .021 | .004 | -.011 | -.021 | -.02 | -.024 | -.027 | -.033 |
| | | | (.059) | (.079) | (.059) | (.048) | (.043) | (.039) | (.036) | (.034) | (.032) |
| | | | 997 | 725 | 997 | 1338 | 1705 | 2089 | 2533 | 3047 | 3562 |
| Science | CR (165) | Persisted $\geq$ 1.5 years | .013 | .014 | .013 | .006 | .004 | .002 | -.001 | -.001 | .001 |
| | | | (.021) | (.034) | (.021) | (.019) | (.018) | (.016) | (.015) | (.014) | (.013) |
| | | | 4389 | 3164 | 4389 | 6050 | 6501 | 8262 | 9336 | 10274 | 11050 |
| Science | CR+C (175) | Persisted $\geq$ 1.5 years | -.053 | -.06 | .003 | .041 | .056 | .034 | .02 | 0 | -.006 |
| | | | (.108) | (.105) | (.084) | (.052) | (.047) | (.041) | (.039) | (.036) | (.035) |
| | | | 761 | 761 | 824 | 1471 | 1591 | 2325 | 2405 | 3336 | 3832 |
| Soc. Stud. | CR (165) | Persisted $\geq$ 1.5 years | .044 | .046 | .044 | .031 | .03 | .027 | .026 | .025 | .025* |
| | | | (.038) | (.051) | (.037) | (.023) | (.019) | (.018) | (.016) | (.015) | (.015) |
| | | | 3782 | 2887 | 3782 | 4694 | 5902 | 6846 | 7760 | 8535 | 9666 |
| Soc. Stud. | CR+C (175) | Persisted $\geq$ 1.5 years | -.089** | -.133** | -.092** | -.077** | -.071** | -.065** | -.061** | -.053* | -.049* |
| | | | (.04) | (.063) | (.042) | (.035) | (.032) | (.031) | (.029) | (.027) | (.026) |
| | | | 1701 | 824 | 1244 | 1701 | 2198 | 2383 | 3105 | 3558 | 4031 |

**Notes:** This table reports the main persistence estimates from Table 4 at GED® CR or GED® CR+C subject test threshold indicated in each row using the optimal bandwidth, as well as RD estimates using all possible symmetric integer bandwidths between 2 and 9 points in the indicated columns. $^{*} = p < 0.1$, $^{**} = p < 0.05$, $^{***} = p < 0.01$.

Appendix Table 8: Additional Full-Sample First Stage RD Estimates

| | Mathematical Reasoning (1) | Reasoning Thru. ELA (2) | Science (3) | Soc. Stud. (4) |
|---|---|---|---|---|
| A. Discontinuities in exam passing & subject-specific CR designations | | | | |
| Passed GED® | .1940*** | .1190*** | .0379*** | .1003*** |
| | (.0056) | (.0053) | (.0101) | (.0061) |
| | 156435 | 195403 | 89855 | 184052 |
| GED ® CR | .9956*** | .9982*** | .9993*** | 1*** |
| | (.0016) | (.0008) | (.0007) | — |
| | 26382 | 72753 | 53996 | 13251 |
| GED ® CR+C | 1*** | .9985*** | .9982*** | 1*** |
| | — | (.0008) | (.0010) | — |
| | 1522 | 22342 | 6110 | 5529 |
| B. Discontinuities in any college readiness designation | | | | |
| GED ® CR | .2784*** | .3975*** | .4016*** | .5379*** |
| | (.0075) | (.0101) | (.0101) | (.0123) |
| | 47743 | 51431 | 53996 | 55170 |
| GED ® CR+C | .5250*** | .5277*** | .3916*** | .6881*** |
| | (.0242) | (.0152) | (.0237) | (.0076) |
| | 3170 | 16676 | 11411 | 10285 |

**Notes:** This table reports coefficients testing whether discontinuities exist in the probability individuals ever reach the credentialling outcomes listed in each row. RD models include all demographic covariates listed in Panel A of Table 1 and their corresponding missing data indicators, as well as fixed effects for quarter of first GED® subject test attempt and state of residence. Distance from each threshold is modeled as a linear function with triangular kernel weights and separate slopes above and below the threshold, as in Equation (1). Bandwidth varies by outcome and subject test threshold, determined using the optimal bandwidth calculations described in Calonico et al. (2019). $^{*} = p < 0.1$, $^{**} = p < 0.05$, $^{***} = p < 0.01$.

Appendix Table 9: RD estimates of any CR or CR+C designation (LATE)

| | Mathematical Reasoning (1) | Reasoning Thru. ELA (2) | Science (3) | Soc. Stud. (4) |
|---|---|---|---|---|
| A. Impact of earning any GED® CR designation | | | | |
| Enrolled within 2 years | .035 | -.031 | .021 | .224 |
| | (.206) | (.143) | (.078) | (.272) |
| | 2048 | 3781 | 6050 | 2887 |
| Persisted $\geq$ 1.5 years | -.017 | -.028 | .037 | .136 |
| | (.167) | (.104) | (.061) | (.118) |
| | 2048 | 3781 | 4389 | 3782 |
| B. Impact of earning any GED® CR+C designation | | | | |
| Enrolled within 2 years | .183 | .026 | .359 | -.170* |
| | (.361) | (.11) | (.259) | (.090) |
| | 369 | 1338 | 824 | 1701 |
| Persisted $\geq$ 1.5 years | -.057 | .008 | -.132 | -.150** |
| | (.285) | (.105) | (.256) | (.067) |
| Observations | 369 | 997 | 761 | 1701 |

**Notes:** This table reports two-stage least squares instrumental variable estimates of the marginal impact of earning any GED® CR or GED® CR+C designation on college outcomes. RD models instrument for earning any college readiness designation with an indicator for whether an individual reached a given GED® CR or GED® CR+C threshold on his or her first GED® subject test score in that subject, controlling for distance from the threshold and its interaction with being above the threshold. RD models include all demographic covariates listed in Panel A of Table 1 and their corresponding missing data indicators, as well as fixed effects for quarter of first GED® subject test attempt and state of residence. Distance from each threshold is modeled as a linear function with triangular kernel weights and separate slopes above and below the threshold, as in Equation (2). Bandwidth varies by outcome and subject test threshold, determined using the optimal bandwidth calculations described in Calonico et al. (2019). $^{*} = p < 0.1$, $^{**} = p < 0.05$, $^{***} = p < 0.01$.