

The Effects of High School Career and Technical Education on Post-Secondary Enrollment and Performance

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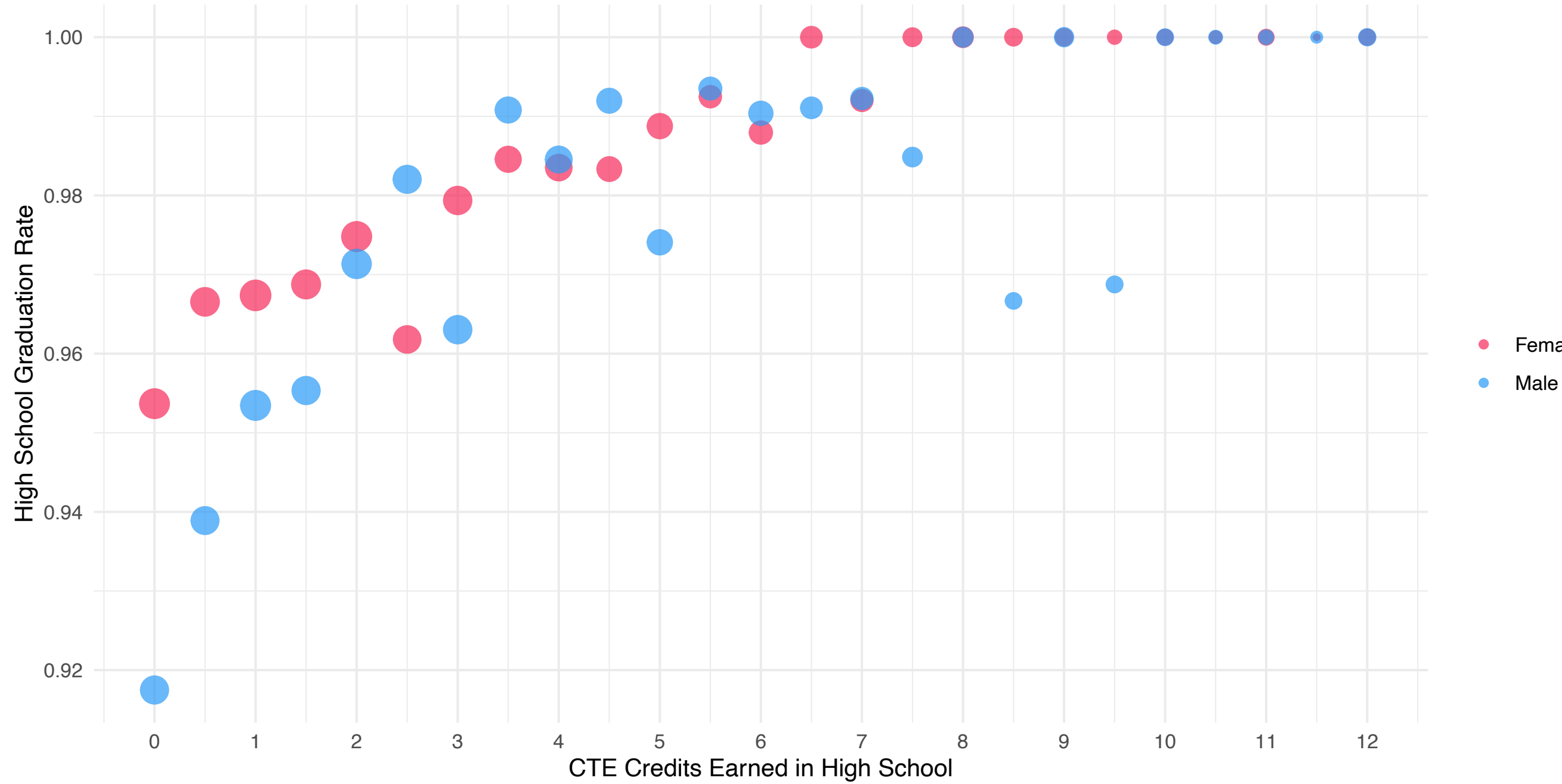
Introduction

The Career and Technical Education (CTE) program in the United States is designed to provide high school students with academic and technical skills, knowledge, and training necessary to succeed in future careers. While most studies focus on the labor market outcomes and several on high school performance, few connect CTE with postsecondary education. My research aims to reveal the relationship between CTE credits earned in high school and high school graduation rates, postsecondary enrollment rates, and postsecondary academic performance, by utilizing the HSLS:09 dataset.

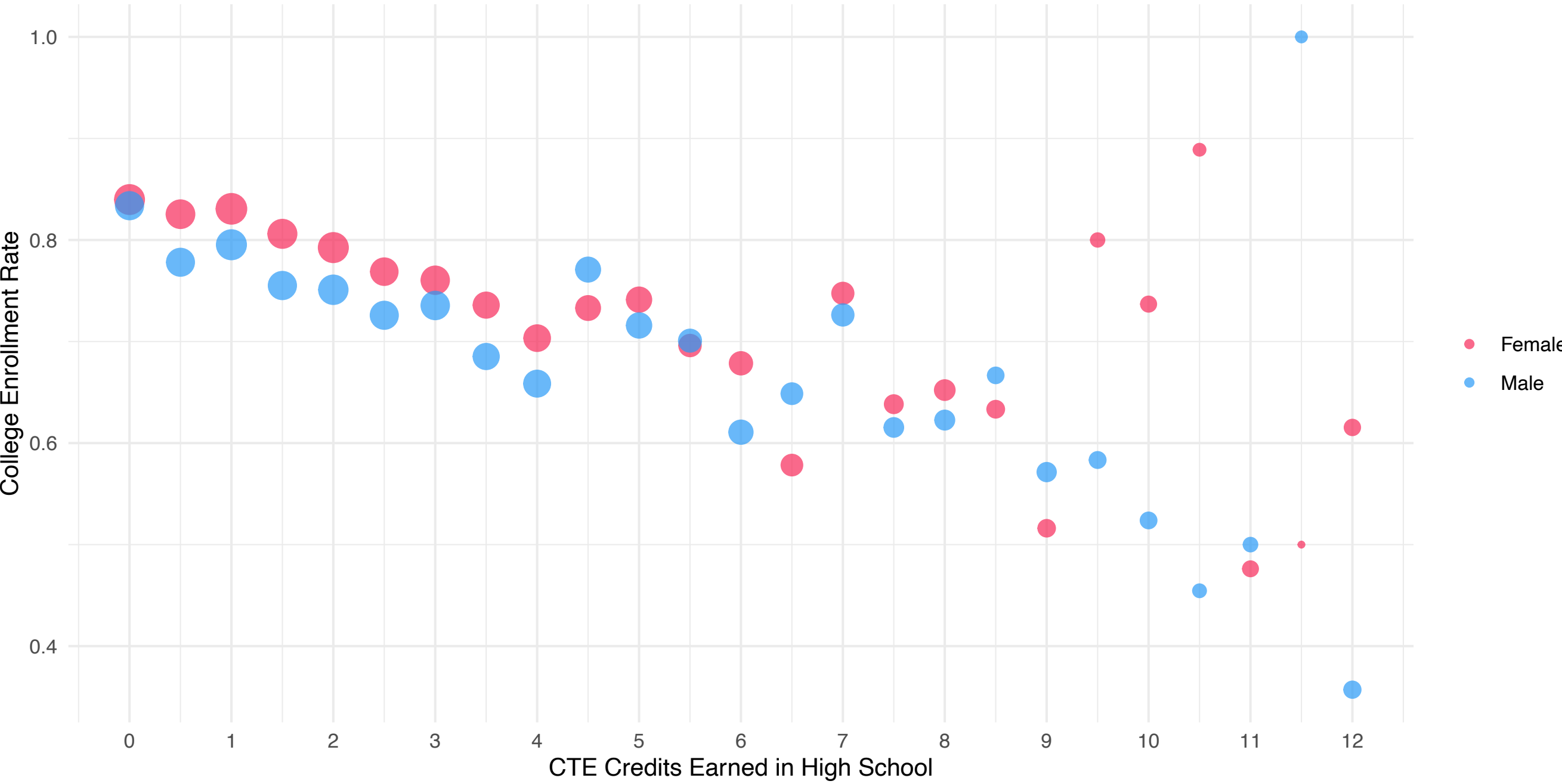
Data

The High School Longitudinal Survey (HSLS:09) is conducted by the National Center for Education Statistics (NCES), which traces the educational and vocational trajectories of over 23,000 ninth graders from 944 schools across the United States, starting in 2009. After cleaning process, 12,737 observations was kept.

Graph1. Average High School Graduation Rate by Gender



Graph2. Average Postsecondary Enrollment Rate by Gender



Notes: The size of each dot is determined by number of observations ($\sqrt[3]{n}$).

Methods

$Outcome_i = \beta_0 + \beta_1CTEcred_i + \beta_2Gender_i + \beta_3CTEcred_i * Gender_i + \beta_4MathT_i + \beta_5SSS_i + \beta_6C_i + \beta_7C_j$

- There are three main outcomes ($Outcome_i$) for individual (i) that I concerned: high school on-time graduation rate, postsecondary enrollment rate within one year of high school graduation, and yearly GPA in postsecondary institution.
- $CTEcred_i$ records the number of CTE credits earned in high school.
- The interaction between $Gender_i$ and $CTEcred_i$ allow us to examine the gender difference.
- $MathT_i$ is a student assessment score in algebraic skills, reasoning, and problem solving for 9th graders.
- Socioeconomic Status Score (SSS_i) is a composite variable calculated using parent/guardians' education, occupation, and family income.
- Individual-level controls (C_i) include race and linguistic background.
- School-level controls (C_j) comprise variables indicating the school's public or private (Catholic) status, the school's locale, and geographical region.

Results

Table1. OLS Estimates of On-time Graduation and Postsecondary Enrollment

	High School Graduation Rate			Postsecondary Enrollment Rate		
	(1)	(2)	(3)	(1)	(2)	(3)
CTE Credit	0.008**** (0.008)	0.008**** (0.001)	0.010**** (0.001)	-0.011**** (0.002)	-0.010** (0.003)	-0.006 (0.003)
Gender	-0.017**** (0.005)	-0.018**** (0.003)	-0.018**** (0.003)	-0.052**** (0.013)	-0.053** (0.015)	-0.055*** (0.015)
CTE Credit × Gender	0.002* (0.001)	0.002* (0.001)	0.002* (0.001)	-0.001 (0.004)	-0.001 (0.002)	-0.000 (0.002)
Math Standardized T Score	0.003**** (0.000)	0.002**** (0.003)	0.003**** (0.000)	0.008**** (0.000)	0.008**** (0.000)	0.008**** (0.000)
Socioeconomic Score	0.021**** (0.002)	0.022**** (0.003)	0.018**** (0.003)	0.095**** (0.006)	0.099**** (0.017)	0.087*** (0.016)

Notes: Column (2) with individual-level controls. Column(3) with both individual-level and school-level controls. Gender = 0 for female and 1 for male. **** p < 0.001, *** p < 0.01, ** p < 0.05, * p < 0.1.

Table2. OLS Estimates of Postsecondary GPA (Yearly)

	2-Year Community College		4-Year College			
	1st Year (1)	2nd Year (2)	1st Year (3)	2nd Year (4)	3rd Year (5)	4th Year (6)
CTE Credit	0.036** (0.014)	0.011 (0.016)	-0.011** (0.003)	-0.009** (0.004)	-0.006 (0.004)	-0.011 (0.006)
Gender	-0.197**** (0.030)	-0.215** (0.071)	-0.263**** (0.031)	-0.252**** (0.024)	-0.263**** (0.012)	-0.253*** (0.054)
CTE Credit × Gender	-0.002 (0.018)	0.011 (0.013)	-0.001 (0.005)	-0.008 (0.006)	0.002 (0.006)	-0.009 (0.016)
Math Standardized T Score	0.025**** (0.003)	0.024**** (0.004)	0.024**** (0.002)	0.024**** (0.001)	0.020**** (0.001)	0.017**** (0.001)
Socioeconomic Score	0.090** (0.037)	0.039 (0.037)	0.106**** (0.016)	0.099**** (0.018)	0.094**** (0.012)	0.095**** (0.009)
N	1,966	1,745	5,241	5,081	4,869	4,623

Notes: All models include individual-level and school-level controls. Gender = 0 for female and 1 for male. **** p < 0.001, *** p < 0.01, ** p < 0.05, * p < 0.1.

Discussion

In terms of high school graduation rates, my findings are consistent with the previous research (Dougherty et al., 2019), all pointing to the positive role of taking CTE courses in on-time high school graduation. Although there are slight gender differences, the positive effect remains for females, which is contrary to previous findings (Ecton and Dougherty, 2022). For both males and females, my analysis revealed that earning CTE credits had no discernible effect on their postsecondary enrollment rate after the introduction of individual and school-level controls, challenging the conclusions of Hemelt et al. (2019). Moreover, my research uncovered that students who received more CTE credits in high school exhibit a significant improvement in their GPA during their first year at community colleges. Conversely, for students entering in four-year institutions, I observed a negative association between CTE credits and college GPA in the first two years.

The significant correlation between the CTE program in high school and the academic performance of students who pursue postsecondary education may helps educationalists and policymakers to review the potential effect of CTE. My research highlights the necessity of distinguishing between two-year community colleges and four-year universities when studying academic performance. The next step would be to investigate the reasons behind these differences.

References

Dougherty, Shaun, Michael Gottfried, and Cameron Sublett. “Does Increasing Career and Technical Education Coursework in High School Boost Educational Attainment and Labor Market Outcomes?” Source: Journal of Education Finance 44, no. 4 (2019): 423–47.

Ecton, Walter G., and Shaun M. Dougherty. “Heterogeneity in High School Career and Technical Education Outcomes.” Educational Evaluation and Policy Analysis 45, no. 1 (August 15, 2022): 157–81.

Hemelt, Steven W., Matthew A. Lenard, and Colleen G. Paeplow. “Building Bridges to Life after High School: Contemporary Career Academies and Student Outcomes.” Economics of Education Review 68 (February 2019): 161–78.

