

MLDS CENTER

Maryland Longitudinal
Data System

Better Data • Informed Choices • Improved Results

**A Bridge to Graduation:
Testing the Effects of an
Alternative Pathway for Students
Who Fail Exit Exams**

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Background and Motivation

In the movement to improve standards for public education and increase college-readiness, states have expanded the use of standardized subject-area exams as a high school graduation requirement

Empirical studies (e.g., Dee & Jacob, 2007; Papay, Murnane & Willett, 2010) suggest that high school exit exams are not meeting their goals. Instead, they have been found to:

- be associated with increased probabilities to dropout
- exacerbate inequalities in high school completion
- have no impact on employment and earnings

Background and Motivation

Alternative graduation pathways offer another option for students to demonstrate mastery of tested subjects

Hemelt and Marcotte (2013) find that adding exit exams did not increase dropout in states where students can use an alternate graduation pathway

- **Can non-test alternatives to exit exams provide students with equivalent preparation for college and the workforce?**

Maryland Exam Policy

Since 2005, Maryland has required (off and on) high school assessments (HSAs) that serve as exit exams in Algebra, Biology, English, and Government

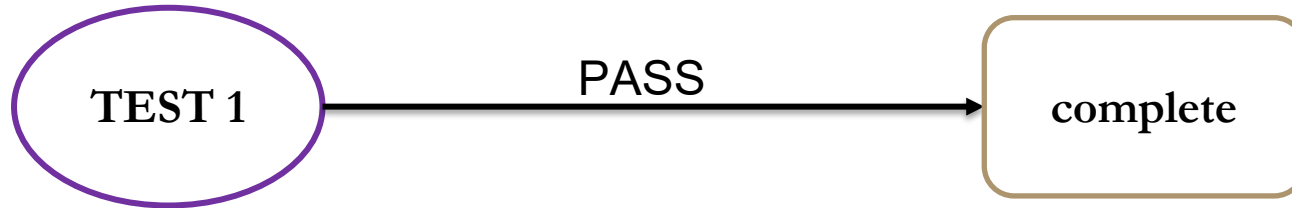
Bridge Plan for Academic Validation

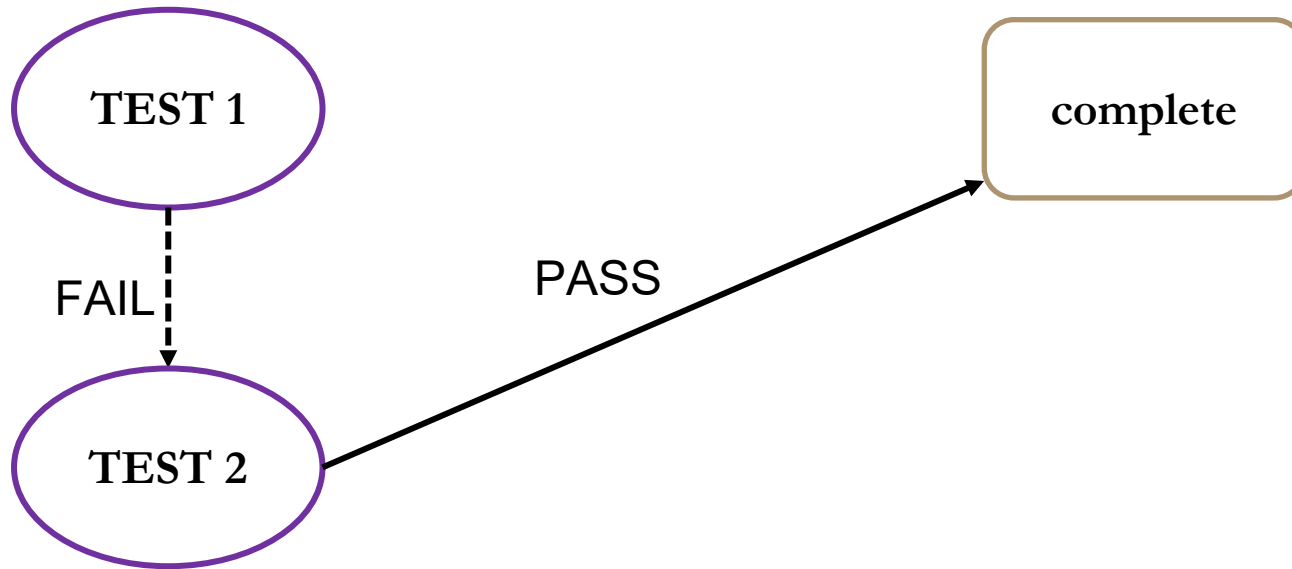
- Administered by each local school district
- Students are eligible after attempting and failing an HSA 2 times
- Student and school design a project work plan
- Product is evaluated by a local school system review panel to determine if the requirement for graduation is met
- Students who complete Bridge get the same diploma as test-passers

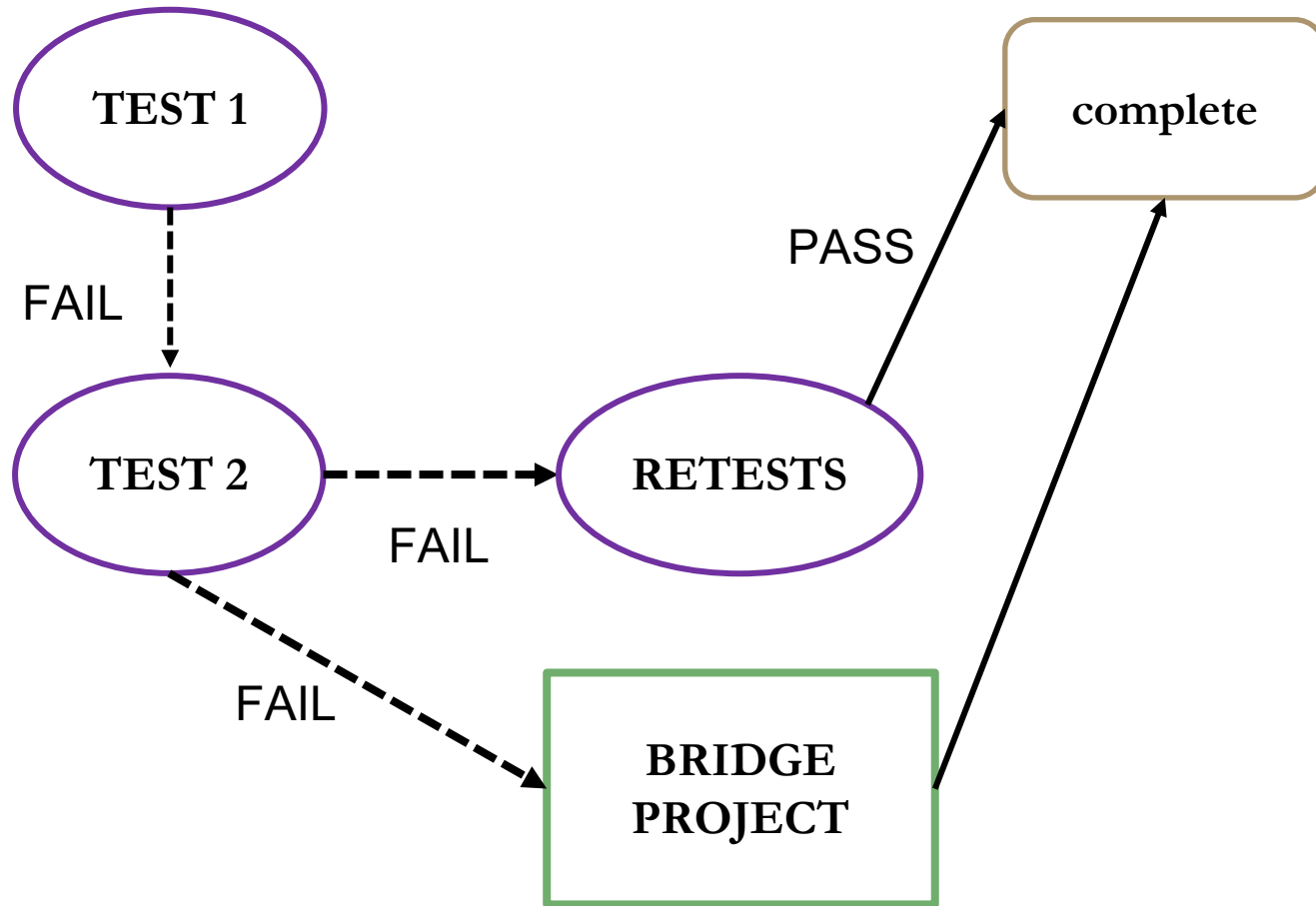
Will the Bridge Plan for Academic Validation be easier than taking an HSA test?

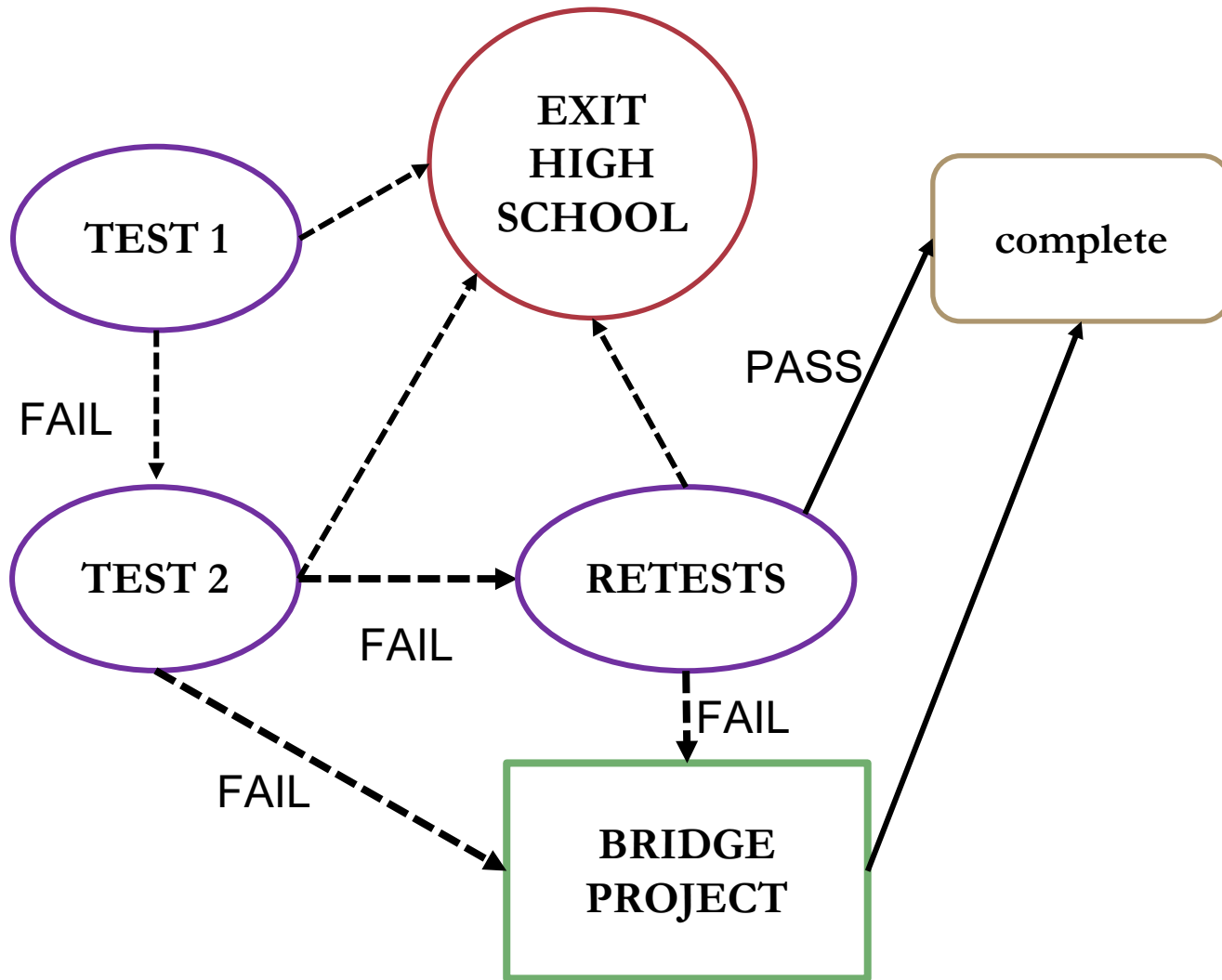
No. The Bridge Plan is a series of challenging projects linked to the Core Learning Goals tested by each HSA.

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Research Questions

Conditioned on failing an HSA twice:

1. Do Bridge completers have different post-secondary outcomes than test-passers?
2. Do Bridge completers have better post-secondary outcomes than non-completers?



MLDS Center Data for this Project

- All Maryland public high school freshmen from 2008 to 2011
- Add background data from middle school in Maryland public schools
- Follow them through 4 years of public high school in Maryland included all attempted HSAs, all completed Bridge projects
- Merge post-secondary outcomes from
 - National Student Clearinghouse & MHEC – 2 & 4-year college enrollment
 - Maryland Unemployment Insurance data - employment & wages

MLDS Cohorts in Analysis

Enter 9 th grade	Graduate HS*	post-secondary Year 1	HSAs required
Fa 2008	Sp 2012	Fa 2012	eng, alg, bio +
Fa 2009	Sp 2013	Fa 2013	eng, alg, bio +
Fa 2010	Sp 2014	Fa 2014	eng, alg, bio +
Fa 2011	Sp 2015	Fa 2015	eng, alg, bio

* assumes normal progress through high school

+ government HSA was given but not required for graduation

Diploma and Bridge Completion after Multiple Failures

Subject	Fail 2 x's*	Diploma without Bridge	Diploma with Bridge
Algebra	51,001	44%	35%
English	41,580	44%	43%
Biology	35,965	36%	50%
Government	12,637	81%	1%

*Includes members of 4 freshman cohorts who failed at least twice.

Empirical Challenge

Estimate the relationship between Bridge and post-secondary outcomes

- Students are selected into Bridge eligibility by failing tests (observable)
- Students self-select into Bridge completion based on motivation, feelings about tests, advice from teachers, peer influence, etc. (unobservable)
- Need to identify the effects of Bridge beyond selection of students into different pathways

Overcome selection bias by:

1. Selecting a sample of students who are eligible to Bridge & similarly motivated to graduate
2. Regression with matching strategies
3. Controlling for observable testing history, demographics, etc.

Sample Selection

- **Only students who are eligible to Bridge in each subject**
 - Failed two attempts in at least one subject
 - Attempted every HSA at least once
 - Disaggregated analysis by subject

- Adequate pre-high school control variables
 - Observations in MLDS for 8th grade attendance, behavior, and middle-school assessments

- Eliminate confounding effects of school transfer or early dropout
 - 4 years of high school enrollment in the local school system
 - No more than one within-district transfer during high school

Empirical Matching Strategies

1. Cell Fixed Effects Model

$$Y_{ijc} = \alpha + \beta(\text{Bridge}_i) + \gamma(\mathbf{X}_i) + \theta_j + \delta_{\text{cohort}} + \varepsilon_{ijc} \quad (1)$$

θ_j - fixed effects group students in cells with identical school district, school, race, gender, FARMS status, and distance bins from passing second HSA attempt

- ✓ Includes only cells with at least one Bridger and one Comparison Student

2. Propensity Score Matching

$$Pscore_{isc} = \text{prob}(\text{Bridge} = 1) = \alpha + \gamma(\mathbf{X}_i) + \pi_{\text{school}} + \delta_{\text{cohort}} + \varepsilon_{isc} \quad (2)$$

- ✓ Local-linear regression method of p-score matching
 - ✓ LLR + within-LEA matching (robustness)

Controls for Observables

- Pre-high school engagement and performance (Warren & Edwards, 2005)
 - 8th grade attendance
 - 8th grade disciplinary suspensions
 - Middle school assessment scores in math, reading, and science
- Demographics
 - Race, gender, ever FARMS, SPED, ELL, Title I, Homeless
- HSA performance
 - First attempt score in all 3 subjects
 - Second attempt score in Bridge subject
- School policies and resources
 - School and cohort fixed effects



2 COMPARISONS

Bridge vs. Test Passer / Bridge vs. No Diploma

3 SUBJECTS

Algebra / Biology / English

3 OUTCOME DOMAINS

College Enrollment / MD UI Employment /
MD UI Wages

+ Disaggregated Analysis:

**By race, FARMS, SPED, number of eligible Bridge subjects, and distance
from passing**

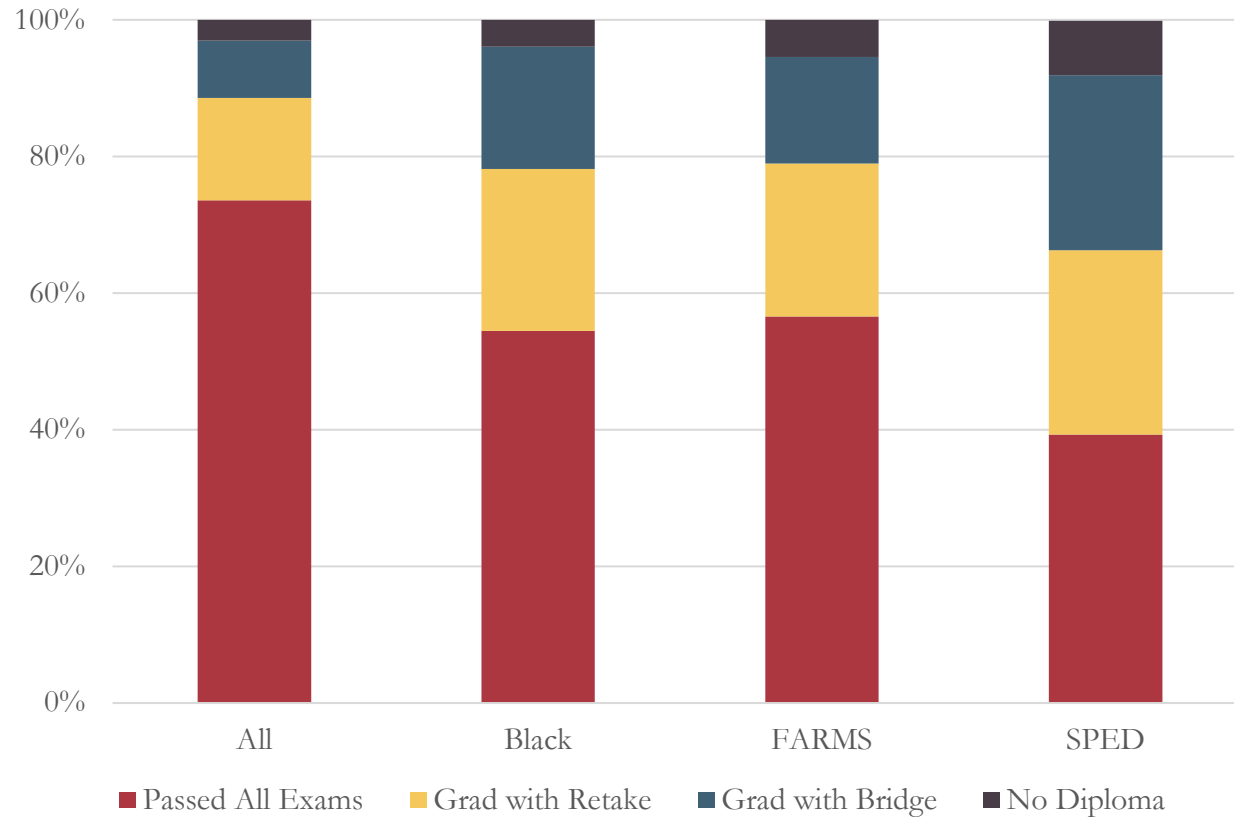
+ Robustness Checks:

Within-district matching, High-Eligibility districts

Limitations

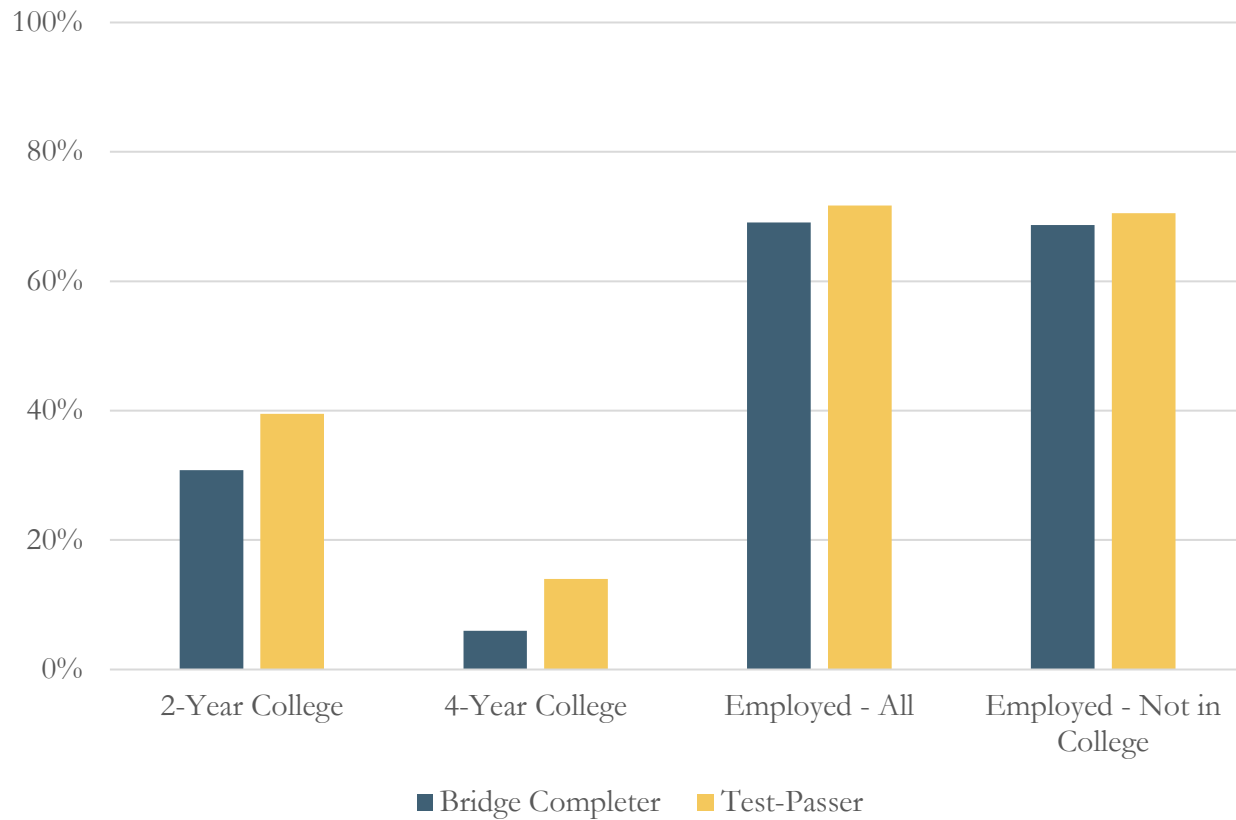
- Cut-point for test-passing was not useful for regression discontinuity (we tried)
- We only observe completed Bridge and not attempted Bridge
- Interaction of performance in different subjects is likely complex
- UI data likely omit employment types that are typical for graduates with low test scores
- Results are not causal effects of Bridge due to self-selection into retesting, Bridge, or non-completion – e.g. students who Bridge might have lower demand for college than those who pass tests

Who Bridges?



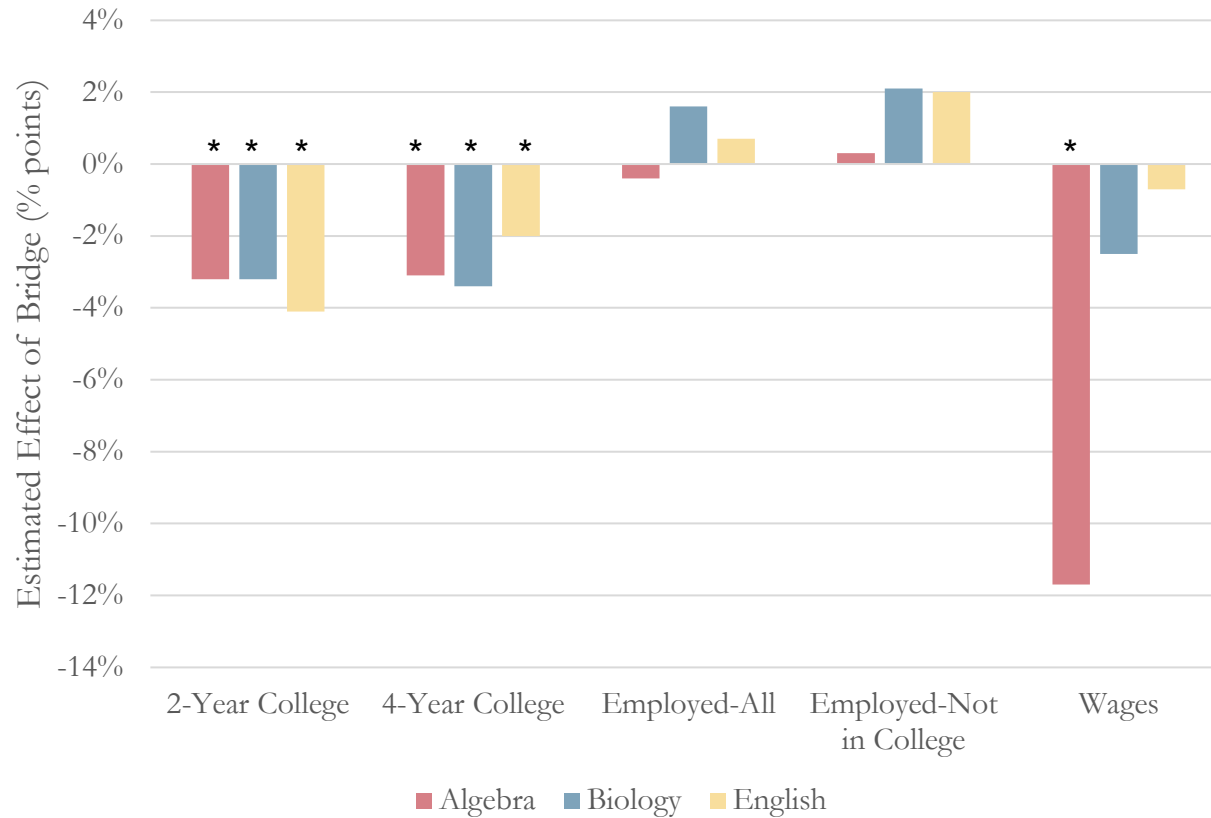


Unmatched Differences Bridge vs. Test Passers



Matched Analysis

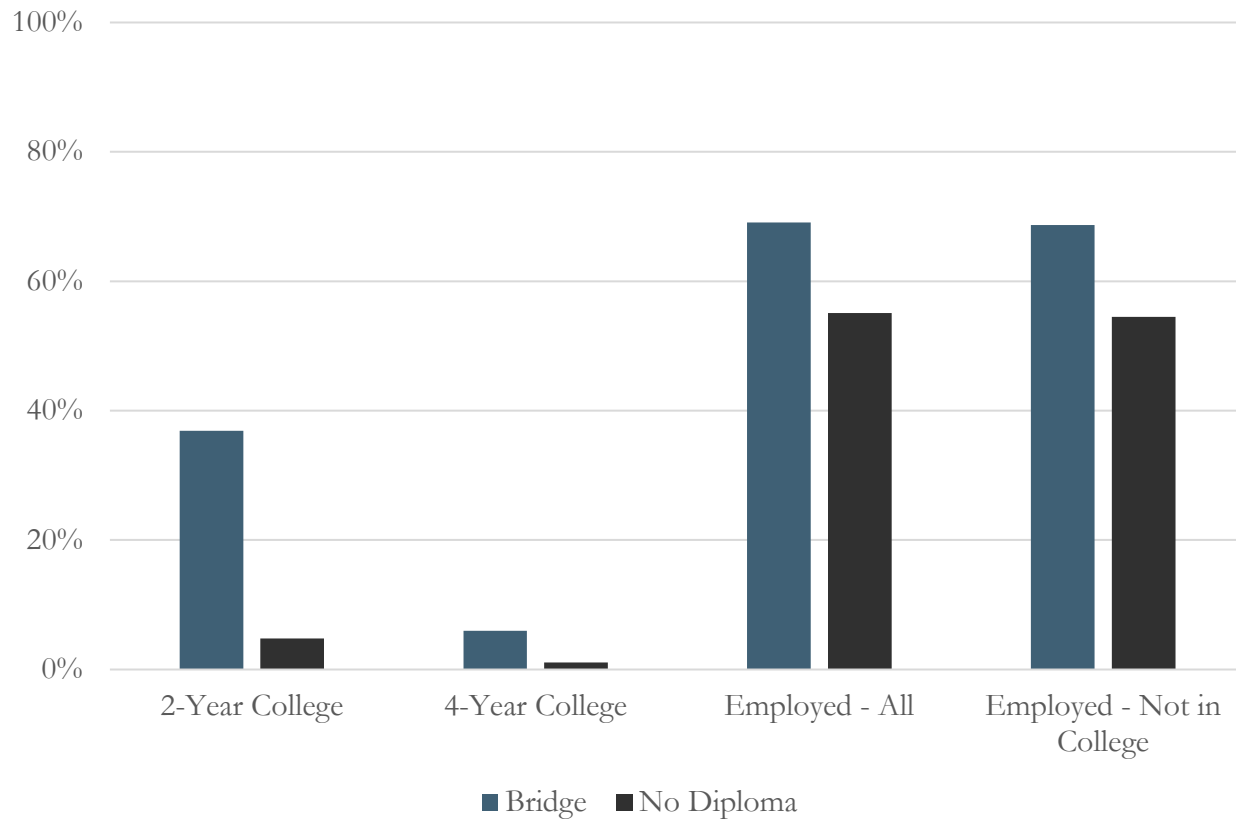
Bridge vs. Test-Passers



Results of cell-matched fixed effects regression. * $p < 0.05$



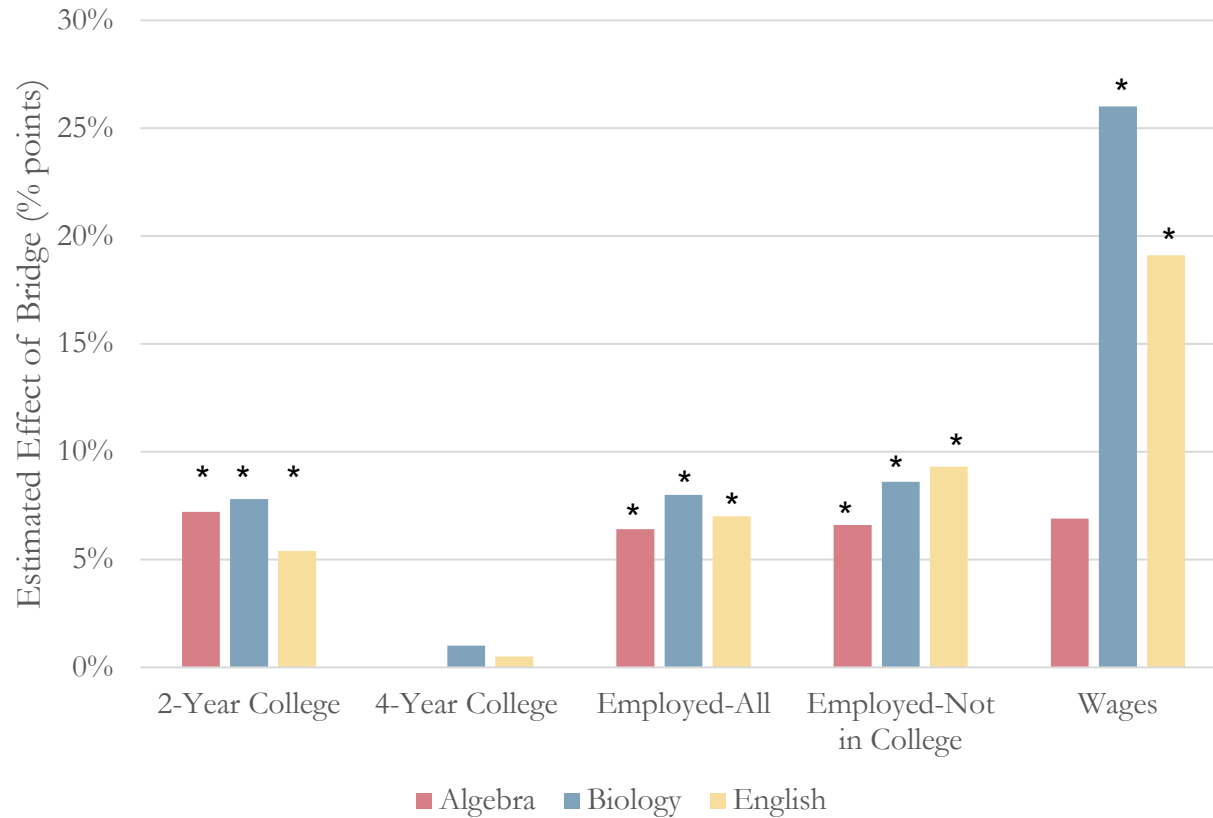
Unmatched Differences Bridge vs. HS Non-Completers





Matched Analysis

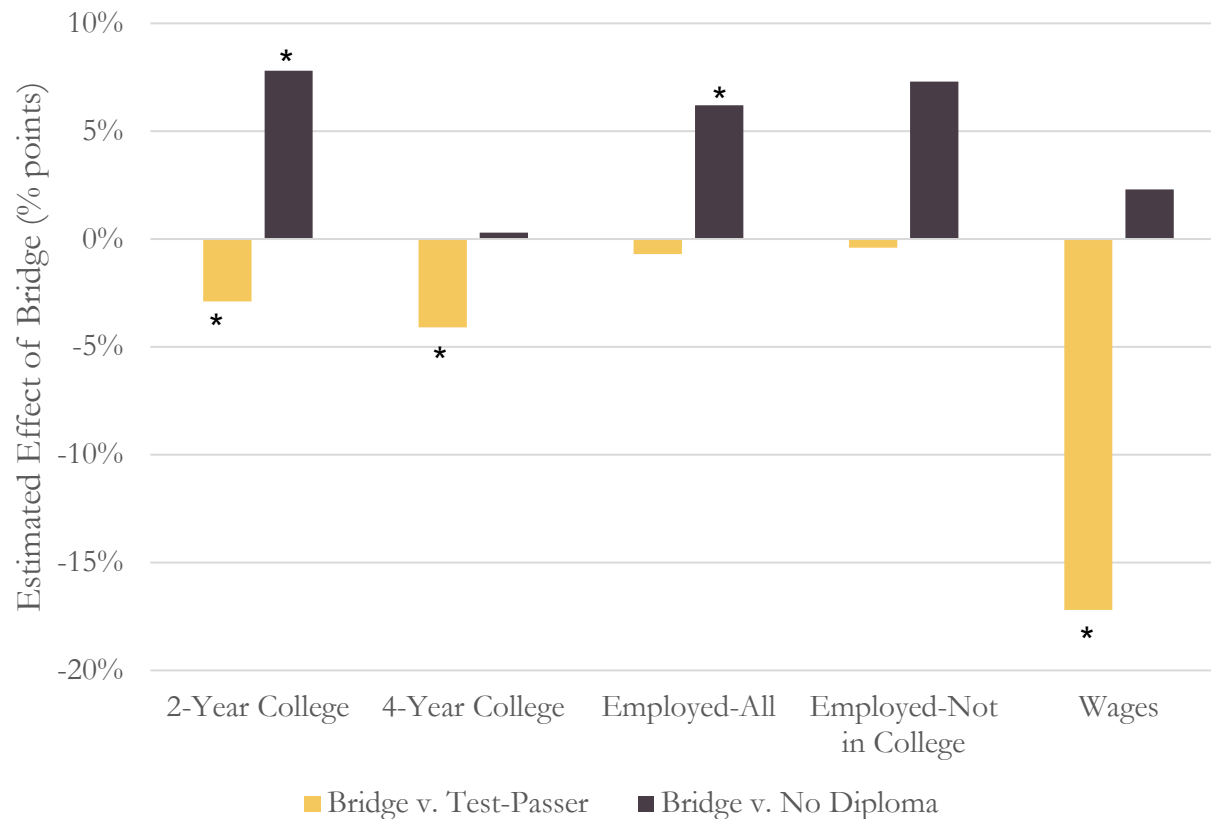
Bridge vs. Non-Completers



Results of cell-matched fixed effects regression. * $p < 0.05$

Matched Analysis

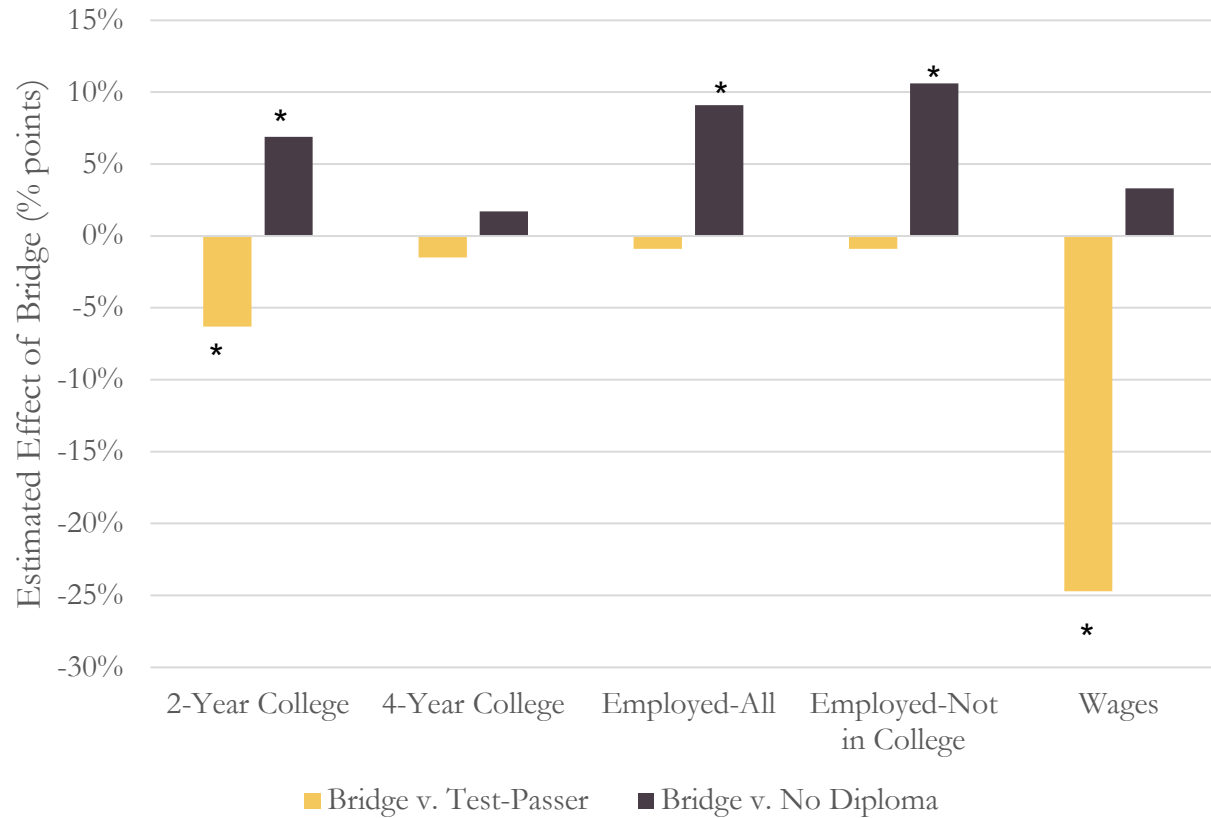
Black Student Subgroup – Algebra



Results of cell-matched fixed effects regression. * $p < 0.05$

Matched Analysis

SPED Subgroup – Algebra



Results of cell-matched fixed effects regression. * $p < 0.05$

Key Findings

- Unmatched comparison overstates the effects of Bridge
- Matched results are similar in PSM and fixed effects estimates
- In matched comparison, Bridge students are less likely to go to college than similar students who retake exit exams.
- Bridge students have similar rates of employment rates to test-passers, but students who pass the Algebra test have higher wages
- Bridge students are more likely to go to 2-year college, work, and earn more than similar students who don't complete high school on time
- Bridge has positive effects relative to non-completion for subpopulations at most risk of dropout

Policy Implications

- With high exit exam failure rates, Bridge is an important cushion for Maryland students, with highest participation rates among populations most at-risk for dropout
- Labor market effects vary by subject suggesting that human capital is developed differently in different subjects. States might want to consider where exit exams vs. projects are most beneficial.
- Removing Bridge would likely lead to more dropout but reforms might improve access to college (if wanted) and job-market skills – particularly in math

Thank you!

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