

$$F = G \frac{m_1 m_2}{d^2}$$

$$i\hbar \frac{\partial}{\partial t} \psi = \hat{H} \psi$$

$$\phi(x) = \frac{1}{\sqrt{2\pi\sigma}} e^{-\frac{(x-\mu)^2}{2\sigma^2}}$$

$$F - E + V = 2$$

$$E = mc^2$$

$$ds \geq 0$$

Expanding STEM Pathways

The Role of BUILD in Shaping Graduate Degree Aspirations

Kevin Eagan and Shuhan "Alice" Ai

University of California, Los Angeles

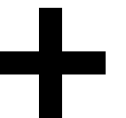
The Problem

- Significant investment in STEMM intervention programs over past 40 years
- Limited shift in the numbers of underrepresented students completing STEMM graduate degrees
- \$500 million investment in BUILD by NIH beginning in 2014 to test and deploy innovative strategies supporting students, faculty, and campus infrastructure
 - One particular aim is strengthening aspirations for and enrollment in graduate science degree programs



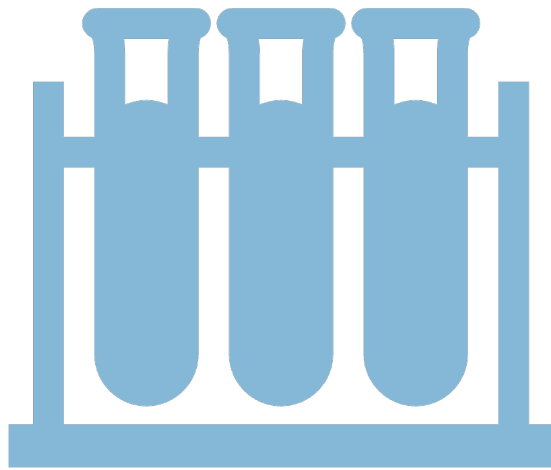
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Research Questions



- Do students who participated in BUILD-related research and mentorship activities have significantly stronger likelihoods of planning to pursue graduate degrees in STEM compared to their demographically and academically similar peers who did not participate in BUILD?
- How does the effect of participating in BUILD-related activities on the likelihood of developing aspirations for graduate study in STEM differ based on students' racial/ethnic or gender identity?

Social Cognitive Career Theory



Social Cognitive
Career Theory (Lent
et al., 1994)

Self-efficacy
Outcome expectations
Learning experiences



BUILD as a learning
environment

Research experiences'
Faculty mentorship
Financial support (e.g.,
tuition waiver, stipend)

Literature Review – Key Insights



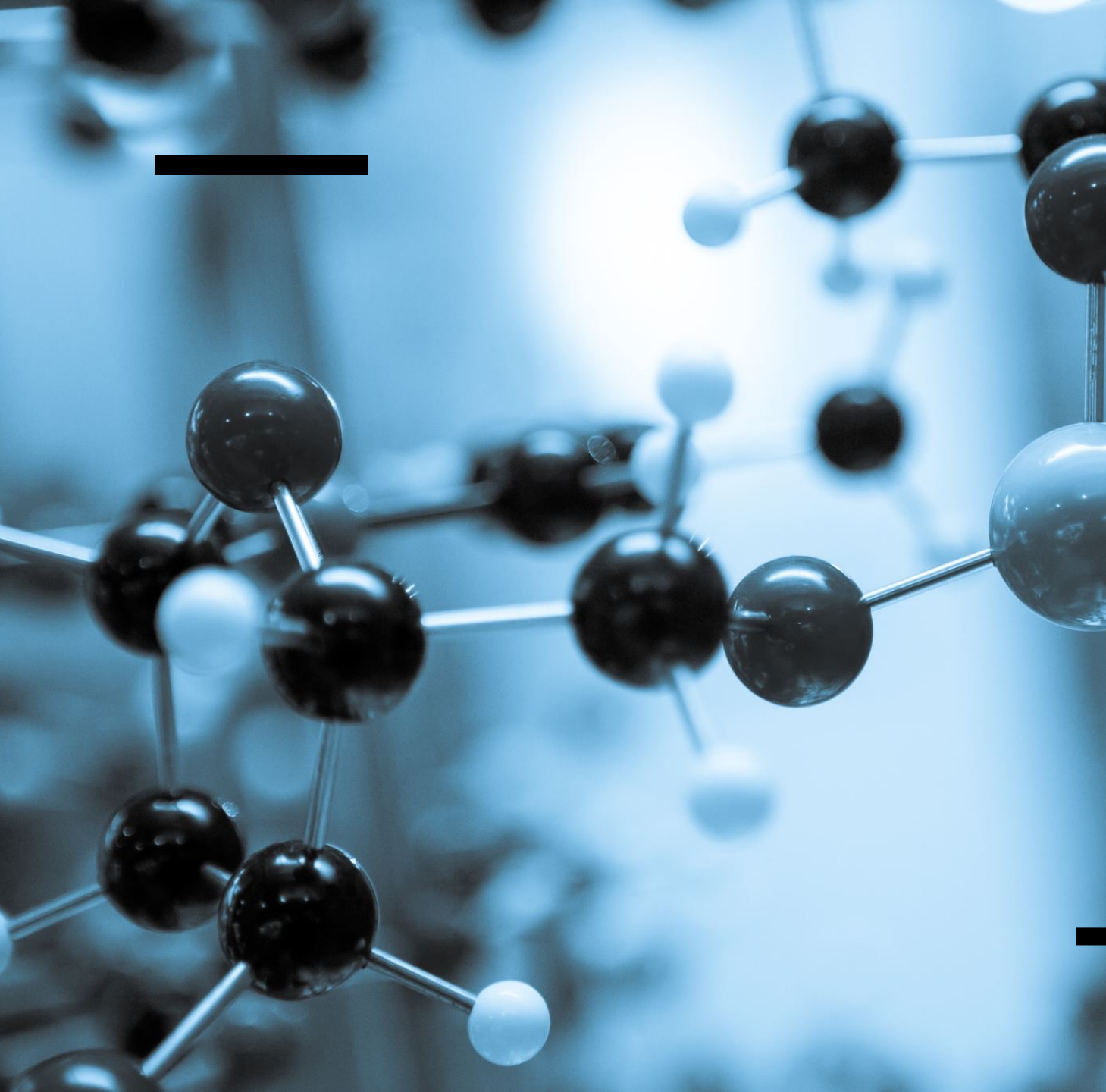
Undergraduate research contributes to graduate degree aspirations (e.g., Eagan et al., 2013)

Mentorship cultivates students' confidence and science identity while opening up access to graduate education (e.g., Packard et al., 2025)

Stronger science identity contributes to persistence along STEM pathways (e.g., Estrada et al., 2018)

Contributions: multi-site program evidence, STEM-specific (vs. general) graduate degree aspirations, exploration of variation across racial and gender identities





Data and Sample

- HERI TF + CSS longitudinal survey data
- Multi-institution sample of 11 BUILD-funded sites (“research-risking” institutions)
- BUILD-exposed participants vs. comparison group not exposed to BUILD
 - 200 BUILD-exposed students compared with 2,357 students never exposed to BUILD

Variables

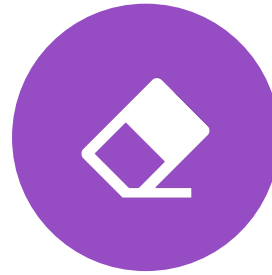
- **DV:** Graduate degree aspirations (STEM vs. non-STEM vs. no plans for graduate degree)
- **Treatment:** BUILD exposure (60+ hours of research + TL4/RL5 funding)
- **Covariates:** Demographics, baseline identity/aspirations, prior achievement,



Analytic Strategies



Descriptives –
frequencies, crosstabs,
ANOVAs/t-tests



Missing data – listwise
deletion, use of missing
data flag, multiple
imputation



Matching – PSM with
inverse weights



Inferential statistics –
fixed effects
multinomial logistic
regression



Key Findings

Table 2

Crosstab Reflecting Graduate Education Aspirations, by BUILD Participation

	Unweighted		Weighted	
	Control	BUILD-Exposed	Control	BUILD-Exposed
STEM Graduate Degree Aspirations	25.5	34.7	25.8	40.8
Non-STEM Graduate Degree Aspirations	13.4	20.1	13.5	15.4
No Graduate Degree Aspirations	61.1	45.2	60.7	43.8

*note: “Weighted” refers to crosstabs adjusted using the ATE inverse probability weight derived from students’ propensity to have participated in the BUILD initiative during college.



Key Findings

–

Multinomial Logistic Regression



01

BUILD predicting
STEM vs. non-
STEM aspirations:
OR=2.06, $p < 0.001$

02

BUILD predicting
STEM vs. no grad
aspirations:
OR=1.96, $p < 0.001$

03

BUILD predicting
non-STEM vs. no
aspirations: no
effect

Other Findings



Gender: women less likely to report STEM aspirations relative to non-STEM aspirations

Race/ethnicity: Black, Latino students show different pathway patterns

Research participation (net of BUILD exposure) increases grad aspirations broadly

Faculty Mentorship (net of BUILD exposure) supports grad aspirations (general, not STEM-specific)

No significant heterogeneous BUILD effects



Discussion and Implications



BUILD shapes **direction**, not just likelihood, of aspirations

Evidence supports sustained funding for equity programs

Integrated (not piecemeal) interventions matter

Persistent disparities suggest need for **targeted design**



Future Research



- **Limitations:**

- Observational data (unobserved selection)
- Self-reported aspirations
- Variation in BUILD implementation not fully captured

- **Future Research:**

- Track actual graduate enrollment
- Examine program intensity & design differences
- Explore intersectional mechanisms more deeply



Thank You



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