
THE GEORGE
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Accumulating Disadvantage?

College Financing Strategies and STEM Outcomes for Underrepresented Students

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***AIR Symposium on Using Research to Inform
Policies and Practices in STEM Education***

September 27, 2013

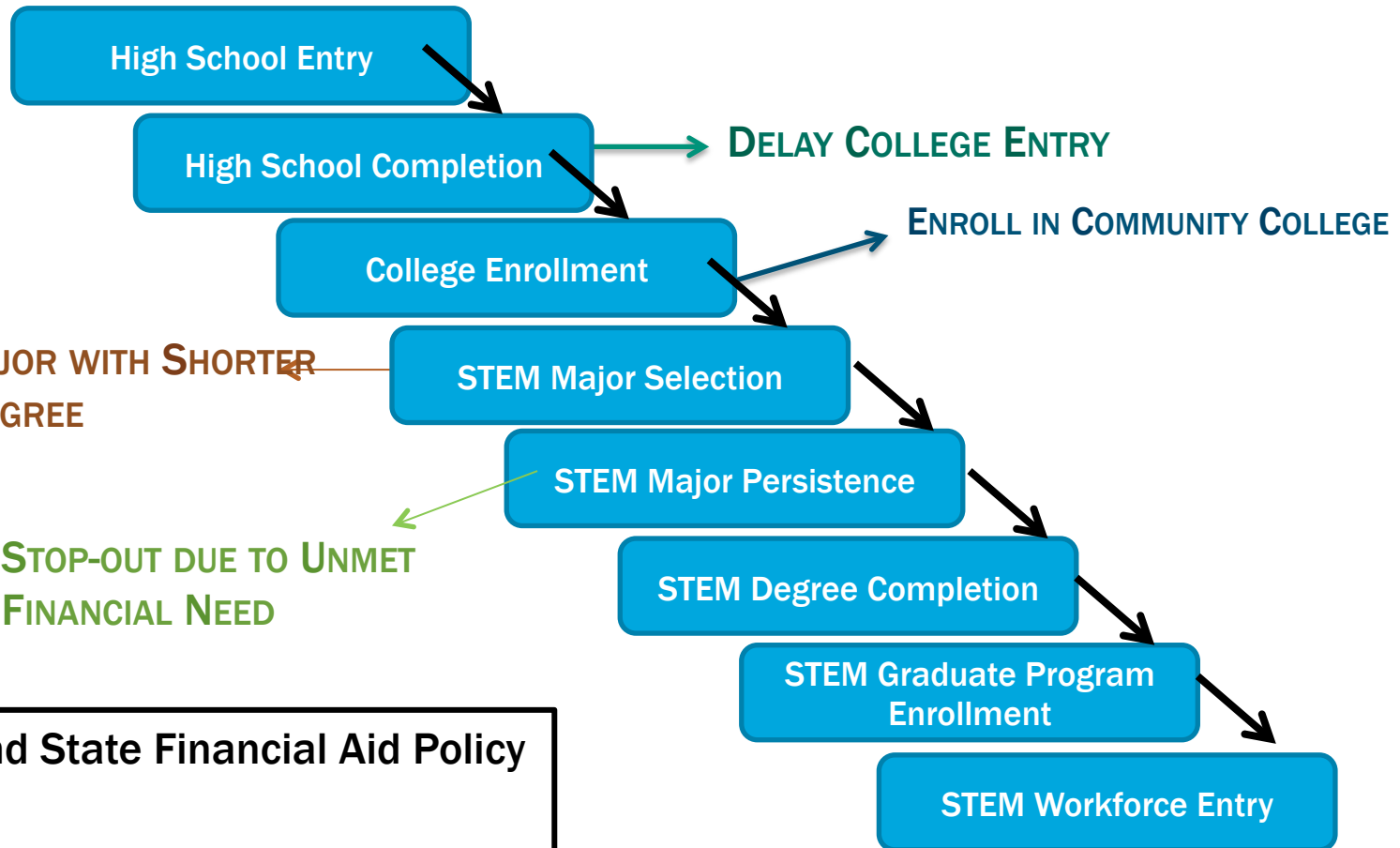
How do financial aid policies at the institutional, state, and federal levels structure underrepresented minority students' pathways to and outcomes in STEM?

Trends in Financial Aid Policy

- Steep Increases in Tuition over Span of Decades
 - High Tuition, High Aid model is prevalent
- Shift from Grants to Loans
 - Less “Free Money” available
 - Requires Student/Parental Investment in Higher Education → Private Benefit
- Declining Purchasing Power of the Pell Grant
 - Gap between Authorized and Appropriated Maximum
 - Growing Enrollment
- “Middle-Class Melt”
 - Policy responses to gap between “aid” and “cost” have shifted financial aid programs from low-income students to middle-class students.

BACKGROUND

COLLEGE AFFORDABILITY AND THE AVAILABILITY OF FINANCIAL AID



Federal and State Financial Aid Policy

- Form
- Criteria

Institutional Practices

- High Tuition/High Aid Model
- Tuition Discounting

College Financing and College Access for Underrepresented Minorities

- Highly stratified patterns of participation in higher education for Underrepresented Minorities
 - Institutional Type
 - Community colleges
 - Less selective four-year institutions
 - Degree Field of Study
 - Underrepresented in Science, Technology, Engineering, Mathematics (STEM) fields
- Minority-Serving Institutions*
- College costs as well as access to and the availability of financial aid are major contributing factors to these patterns
 - Growing reliance on less desirable forms of financial aid (i.e., loans)
 - Perceptions of costs and orientation toward specific forms of aid and/or college financing strategies structure access and college choice
 - Persistent Inequalities: Income and Wealth
 - Higher Levels of Financial Need among URM

BACKGROUND

Relating College Financing Strategies and Institutional Pathways to STEM

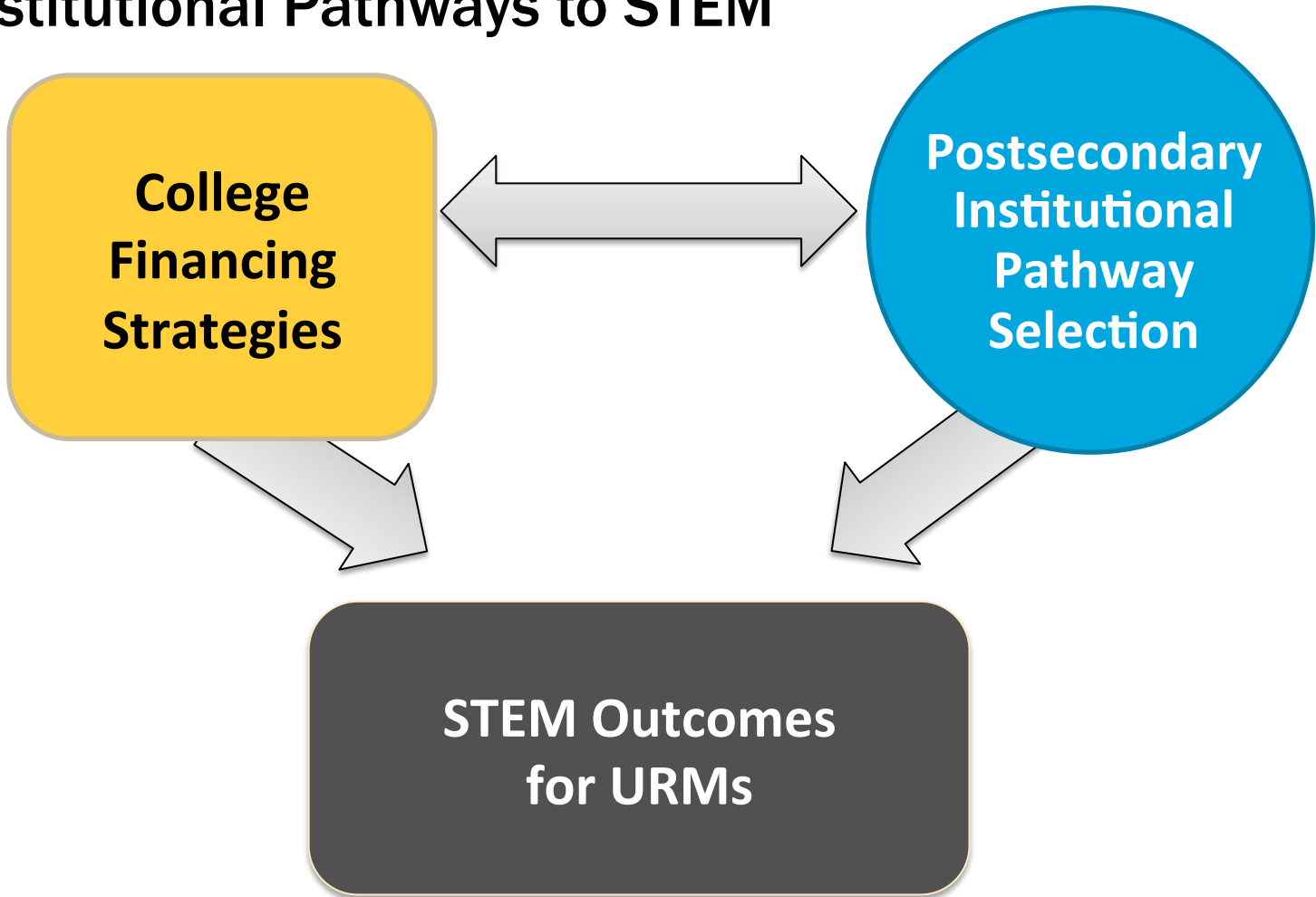
Extant Research on Underrepresented Minorities in STEM Fields

- STEM aspirations
- Minority student interest in and recruitment to STEM fields
- Pre-college academic preparation for STEM
- STEM departmental climate and retention/attrition
- STEM Faculty interaction

PURPOSE OF THE
STUDY

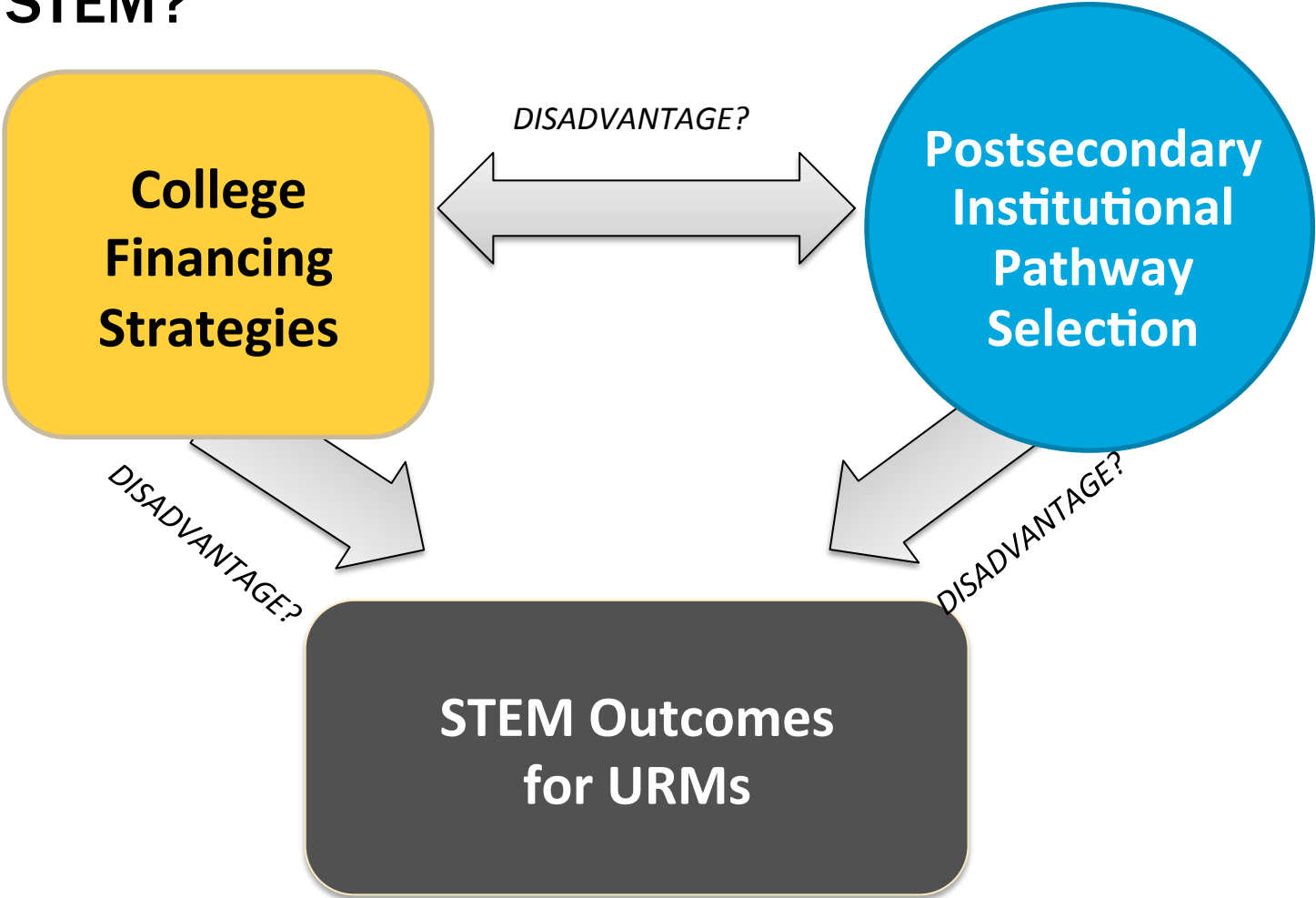
The relationships among financial aid policy, students' college financing strategies, and STEM access and outcomes are understudied.

Relating College Financing Strategies and Institutional Pathways to STEM



PURPOSE OF THE STUDY

Do College Financing Strategies Disadvantage URM Students in STEM?



PURPOSE OF THE STUDY

Relating College Financing Strategies and Institutional Pathways to STEM

- ① What college financing strategies were employed by underrepresented minority STEM bachelor's degree holders?
- ② How do these financing strategies vary by SES among African American and Latina/o bachelor's degree holders?
- ③ What, if any, differences in college financing strategies exist among African American, Latina/o, and White STEM bachelor's degree holders of comparable socioeconomic status, holding all else equal?

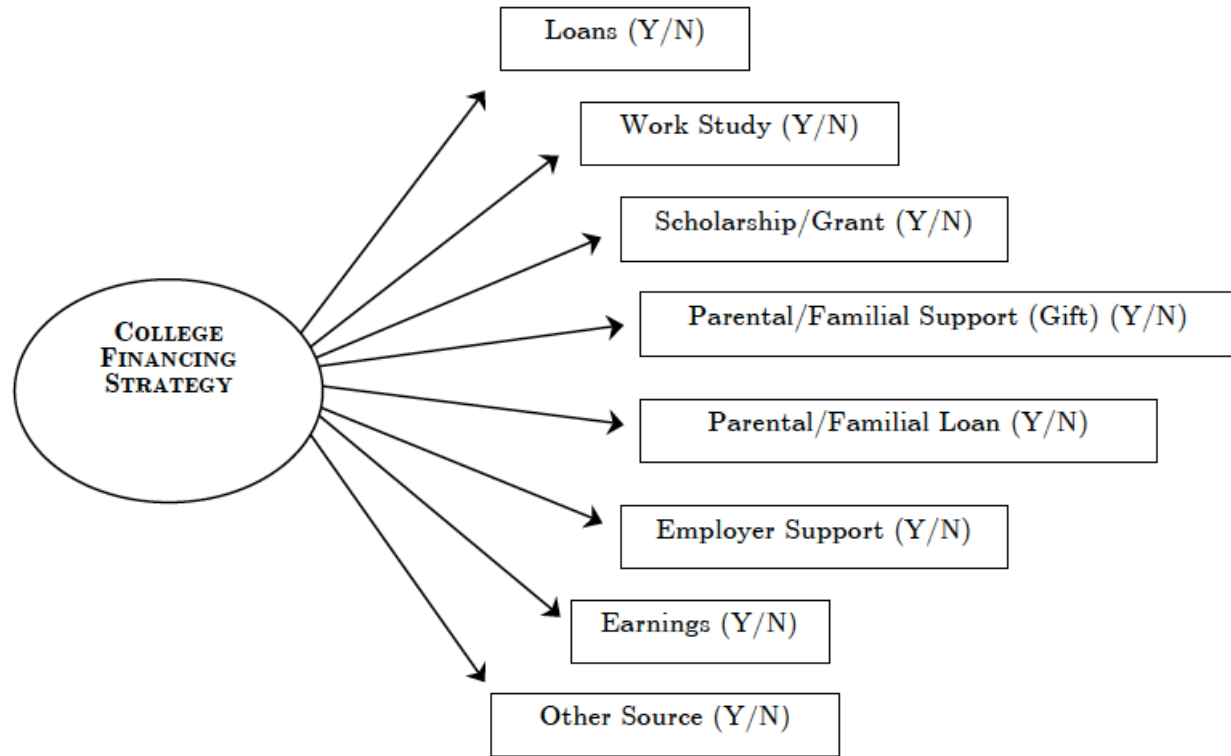
RESEARCH
QUESTIONS

Research Design, Data, and Methods

- National Survey of Recent College Graduates (NSRCG)
 - STEM B.S. degree earners
- *Key NSRCG Variables*
 - Degree-granting institution
 - Financial Aid
 - Forms of financial aid used
 - Cumulative undergraduate loan debt
 - Short-term post-baccalaureate outcomes
- Latent Class Analysis (LCA) with Covariates

Research Design, Data, and Methods

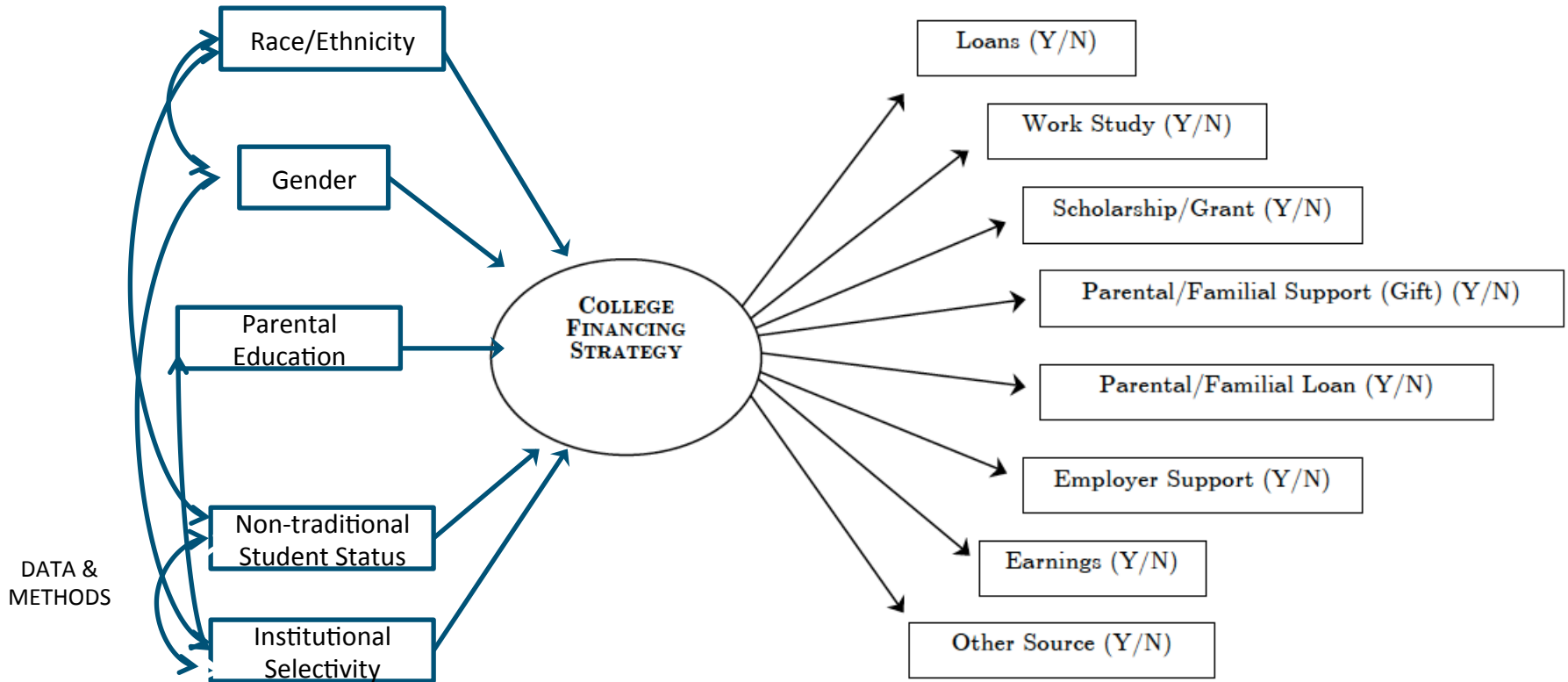
- Latent Class Analysis (LCA)



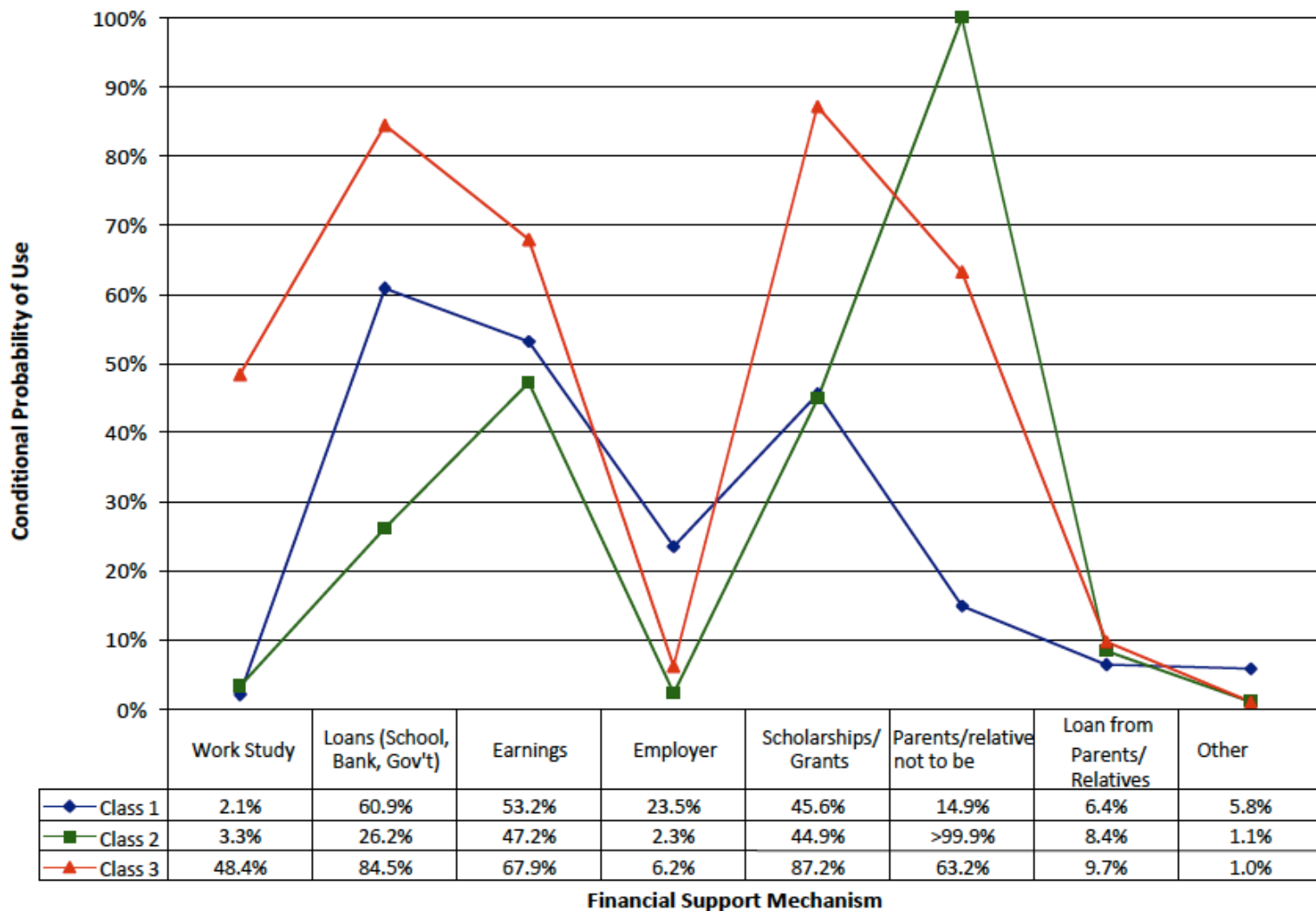
DATA &
METHODS

Research Design, Data, and Methods

- Latent Class Analysis (LCA)



College Financing Strategies Employed by STEM Bachelor's Degree Holders



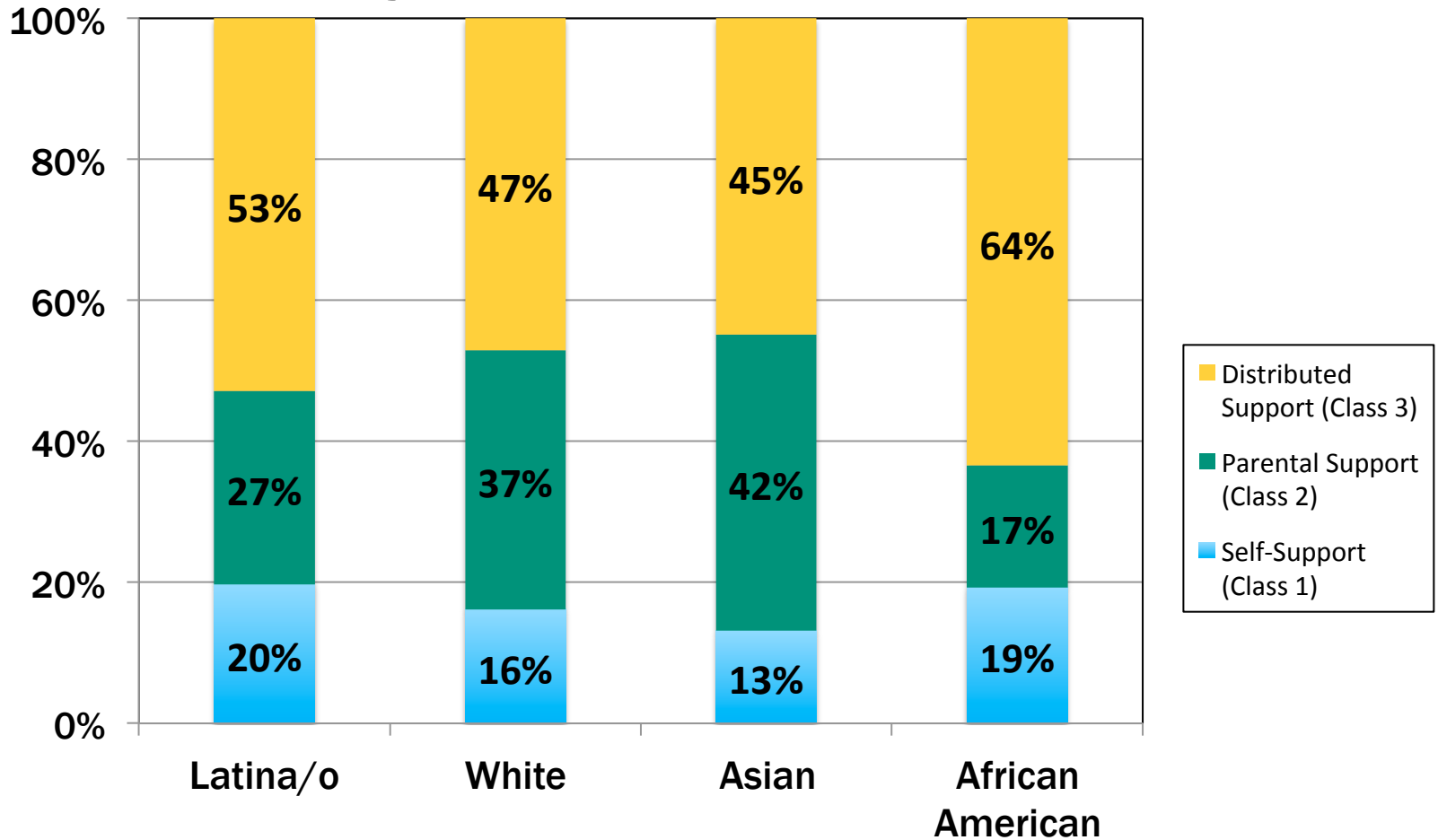
Source: Analyses of the NSF 2003 National Survey of Recent College Graduates (NSRCG).

College Financing Strategies

Self-Support (Class 1)	Parental Support (Class 2)	Distributed Support (Class 3)
<p>Primarily relied on: Loans</p> <p>Earnings</p> <p>Employer Support</p> <p>To a lesser extent: Scholarships/Grants</p> <p>Little to no: Work Study Parental/Familial Gifts (not to be repaid)</p>	<p>Primarily relied on: Parental/Familial Gifts (not to be repaid)</p> <p>Earnings</p> <p>Scholarships/Grants</p> <p>To a lesser extent: Loans</p> <p>Little to no: Work Study Employer Support</p>	<p>Primarily relied on: Loans</p> <p>Earnings</p> <p>Scholarships/Grants</p> <p>Work Study</p> <p>To a lesser extent: Parental/Familial Gifts (not to be repaid)</p> <p>Little to no: Employer Support</p>

FINDINGS

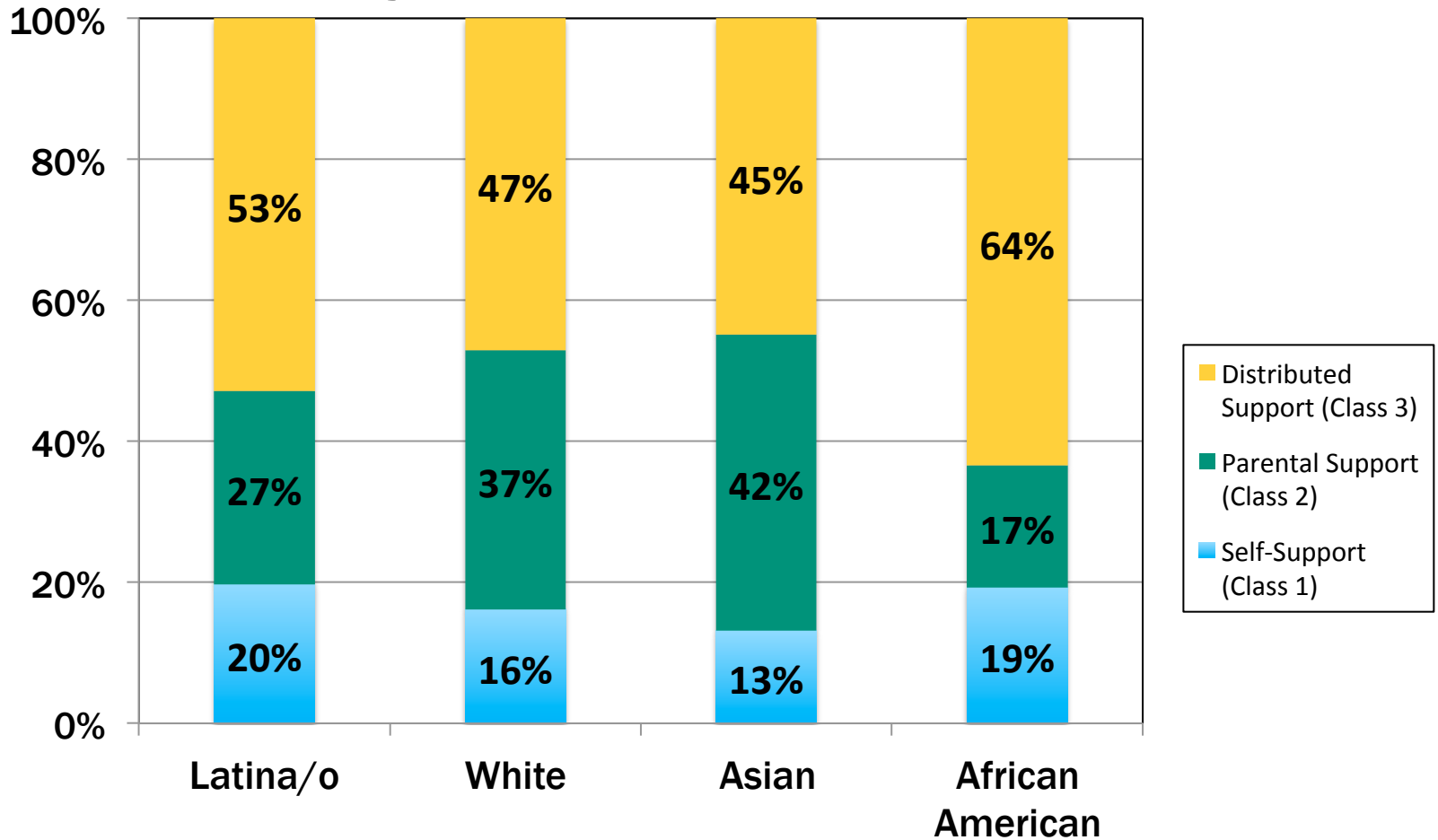
Prevalence of College Financing Strategies by Race/Ethnicity



Institutional Pathways and Financing Strategies

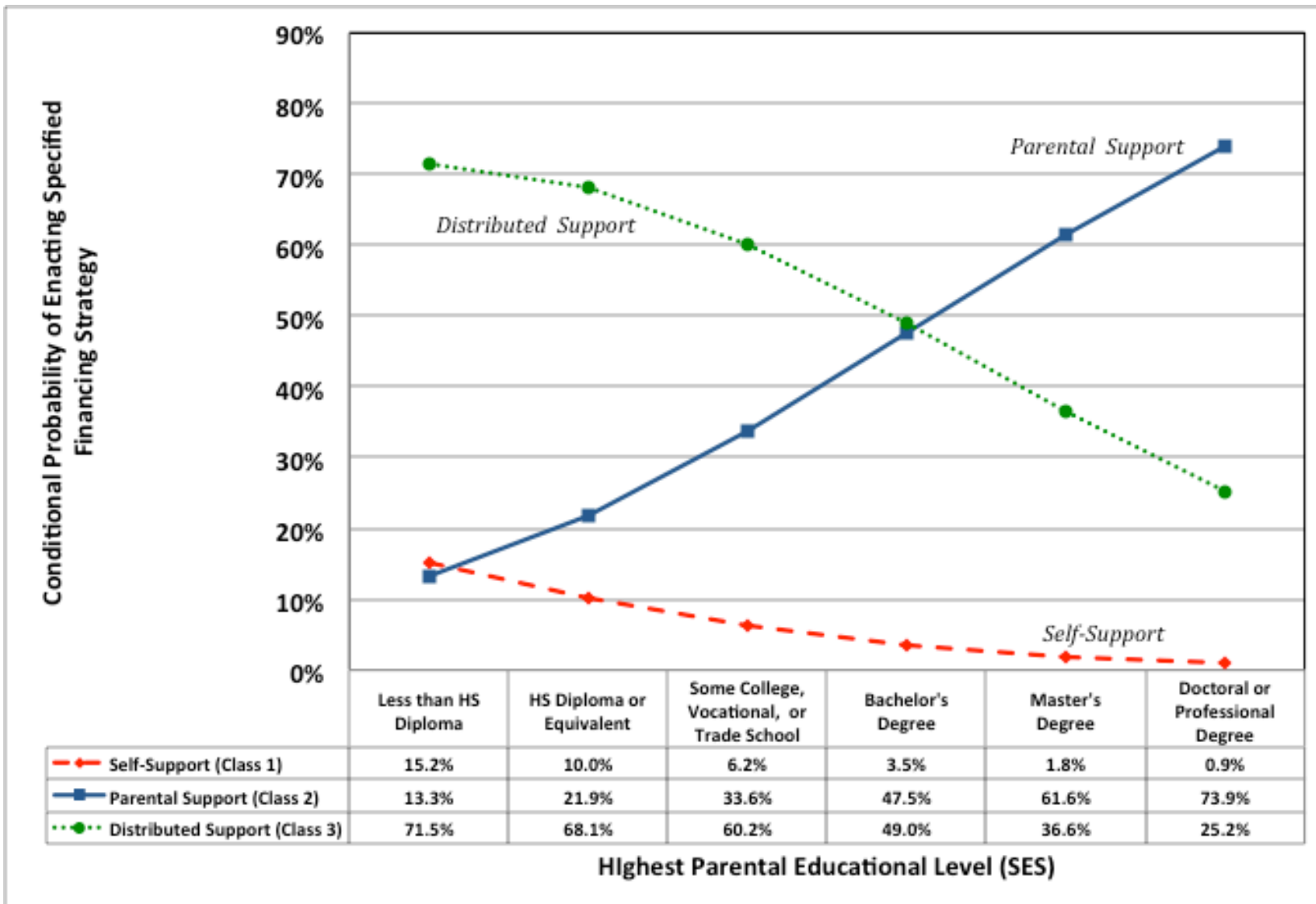
- Among STEM Bachelor's Degree Holders:
 - “Self-support” financing strategy was associated with potentially “disadvantaging” STEM pathways
 - Community college attendance
 - Less selective four-year institutions
 - Non-research institutions
 - “Distributed support” financing strategy also associated with “disadvantaging” STEM pathways
 - Community college
 - Less selective institutions
- ⇒ Students who employed “Distributed support” strategy completed the degree with more student loan debt.

Prevalence of College Financing Strategies by Race/Ethnicity



Are College Financing Strategies Conditioned by SES and Race/Ethnicity?

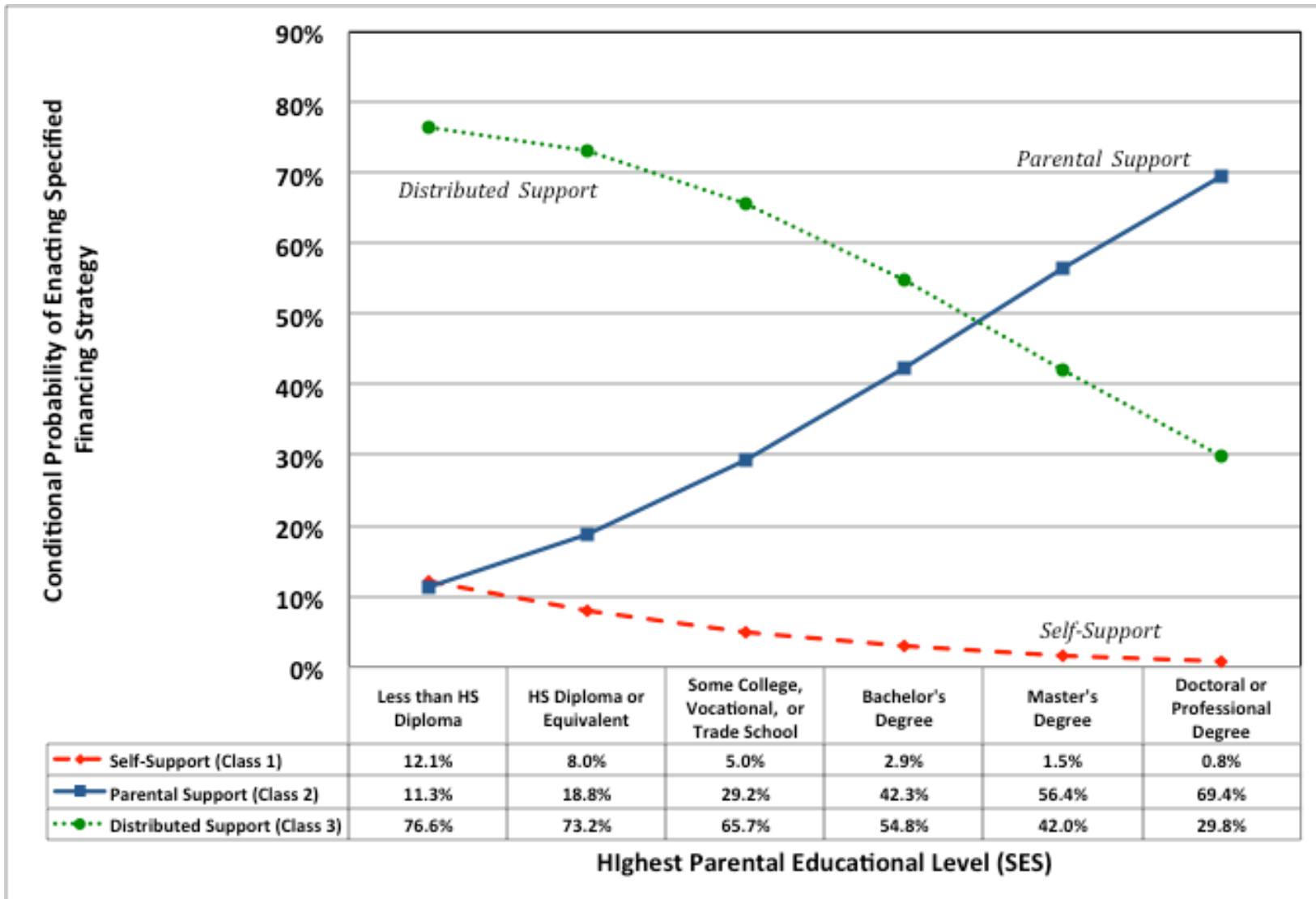
Whites



FINDINGS

Are College Financing Strategies Conditioned by SES and Race/Ethnicity?

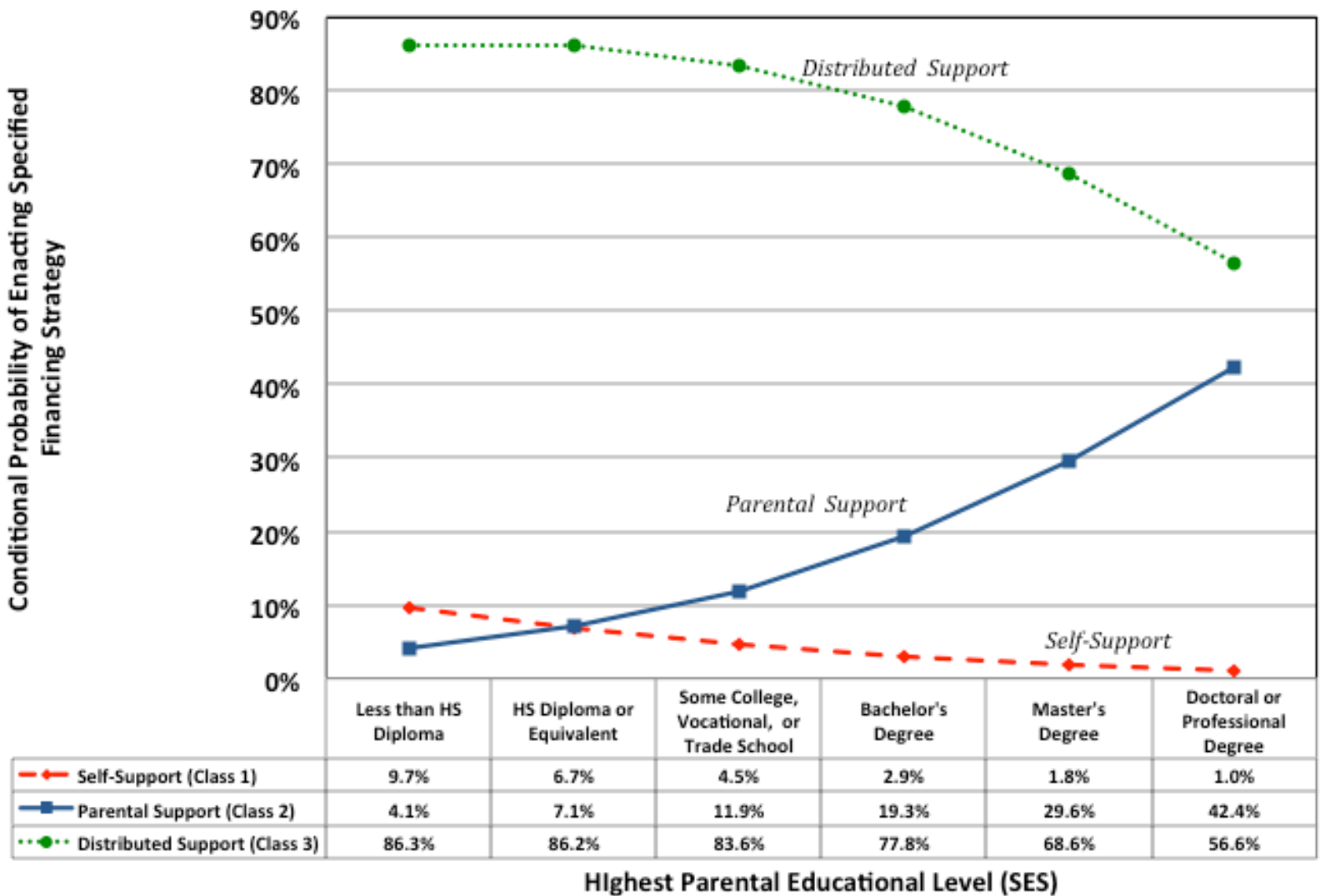
Latinas/os



FINDINGS

Are College Financing Strategies Conditioned by SES and Race/Ethnicity?

African Americans



FINDINGS

Racial/Ethnic Differences in College Financing Strategies among STEM B.S. Degree Holders

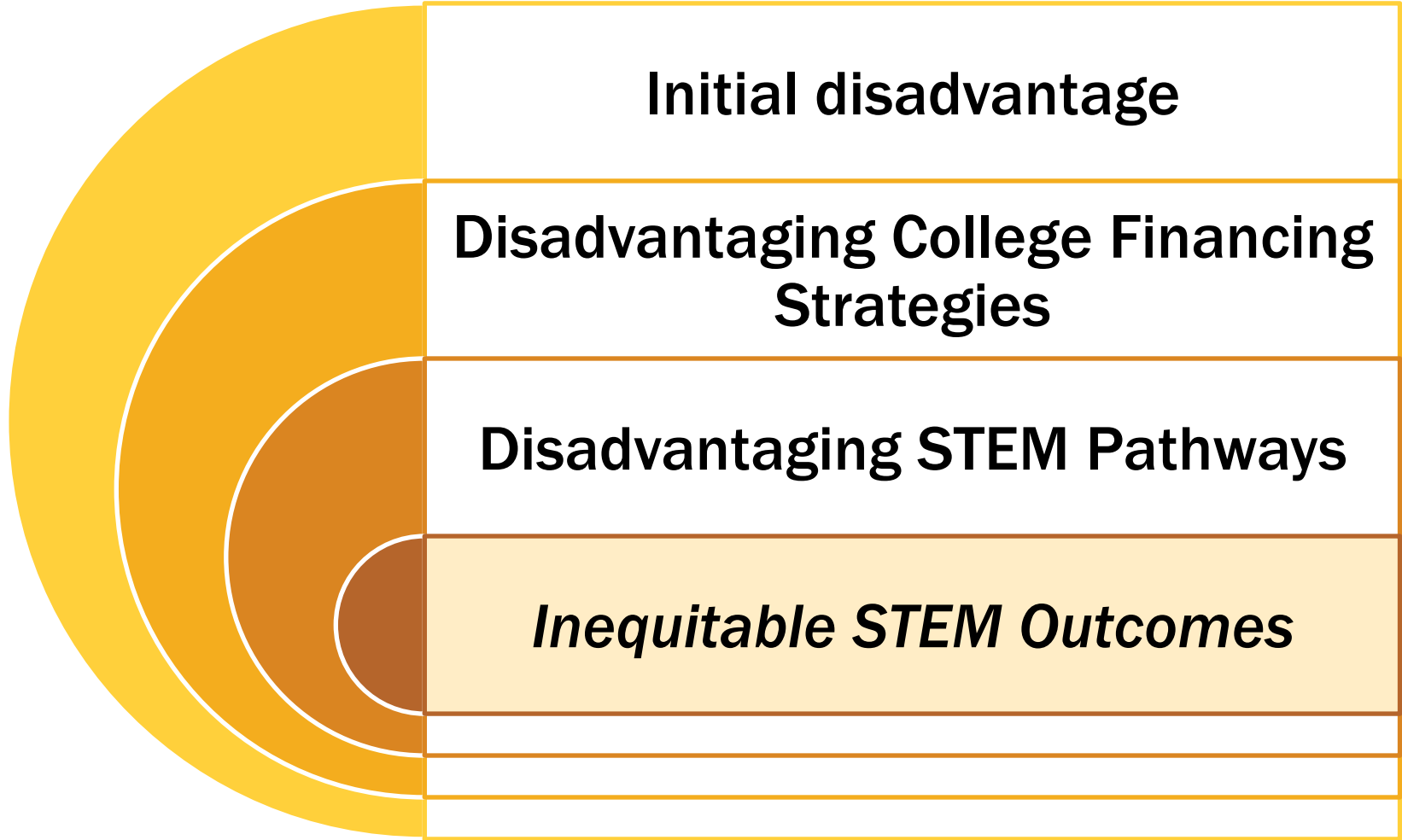
- African American and Latina/o STEM B.S. Degree Holders:
 - Less likely than Whites to employ Parental Support strategy
 - More likely than Whites to employ Distributed Support strategy
- Latinas/os from higher SES backgrounds employ college financing strategies in patterns similar to those of higher-SES Whites and Asians
- African Americans from higher SES backgrounds are *significantly* less likely than higher-SES Whites to employ a parental support strategy

Racial/Ethnic Differences in College Financing Strategies among STEM B.S. Degree Holders

- African Americans much more likely to employ “Distributed Support” strategy than any other racial/ethnic group:
 - Lower Expected Parental Contribution (EPC) (NPSAS:08)
 - More likely to borrow (Price, 2004; NPSAS:08)
 - Accumulate higher levels of student loan debt (Price, 2004; NPSAS:08)
 - More likely than any other racial/ethnic group to work while in college
 - 60% of African American STEM majors work 26+ hours/week while in college

Conclusions and Implications

- **Distributed Support: A Disadvantaging Financing Strategy?**
 - **Debt reduces likelihood of graduate school enrollment for STEM baccalaureates** (Malcom & Dowd, 2012)
 - **High debt burden (debt : income) can cause financial hardship, thereby reducing quality of life and increasing chances of loan default** (Baum & Schwartz, 2006; Dowd, 2008)
 - **Higher levels of debt can impact creditworthiness, chances of homeownership, and future wealth attainment** (Shapiro, 2004; ECMC, 2003; Price, 2004)
 - **Working 20+ hours/week associated with lower levels of student engagement** (Pascarella & Terenzini, 2005)



Conclusions and Implications for Practice

- **What Can Higher Education Institutions Do?**
 - **Consider the impact of financial aid on college decision-making: conditioned by SES and Race/Ethnicity**
 - **Disaggregate Data on Student Financial Aid by Race/Ethnicity and SES**
 - **Consider the effect of various forms of financial aid on college and post-baccalaureate outcomes**

Conclusions and Implications for Practice

- **Empowering Students and Parents with Knowledge**
 - **Implications of Forms of Financial Aid on Outcomes**
 - **Manageable Debt**
 - **Debt Forgiveness and Income-Based Repayment Programs**
- **Financial Education for College Students**
- **Planning to Finance Graduate School**

Conclusions and Implications for Policy

- **The Future of Pell Grants**
 - **Implications of Increasing, Maintaining, or Cutting Funding for Pell Grant program**
 - **Disproportionate Impact on Historically Disadvantaged Groups?**
- **Recent Policy Changes and Ongoing Policy Discussions:**
 - **Elimination of loan subsidies for graduate students**
 - **Emphasis on Broadening Participation in STEM and increasing STEM graduate degree enrollment**
 - **Debt Forgiveness Policies, Income-Based Repayment (IBR)**

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