

Quantifying inequitable education pathways to scientific and technical jobs

Katie Spoon

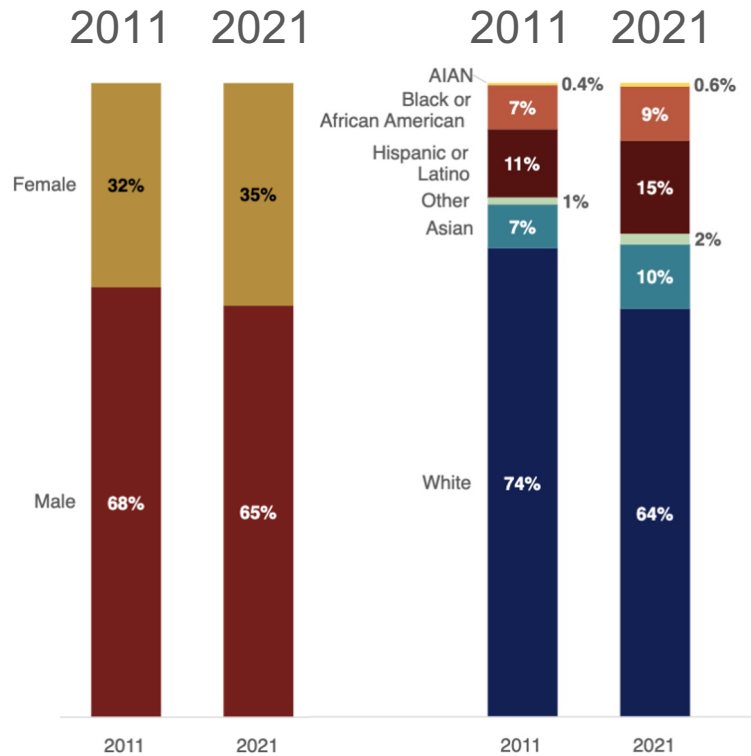
University of Colorado Boulder

With Clara Boothby and Kevin Welner

Who becomes a scientist, and how?

Careers





Many scientific and technical careers have remained white, male, and upper-class.

Who becomes a scientist, and how?

Careers



Early childhood



Primary



Secondary



Leave

Graduate



< HS

HS

2-year program



Leave

Graduate



< AS

AS

Transfer

4-year program



Leave

Graduate



< BS

BS

Graduate program



Leave

Graduate



MS; MD; PHD

Careers



Most of the literature is **transition-specific**

Secondary



Leave Graduate



4-year program



Most of the literature is **transition-specific** and **group-specific**

Secondary



Leave Graduate

Women
People of color
First-gen students

Typically studied separately

4-year program



Most of the literature is **transition-specific** and **group-specific**

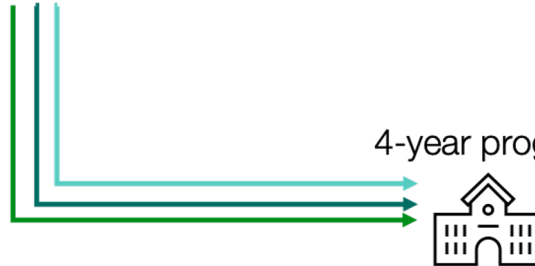
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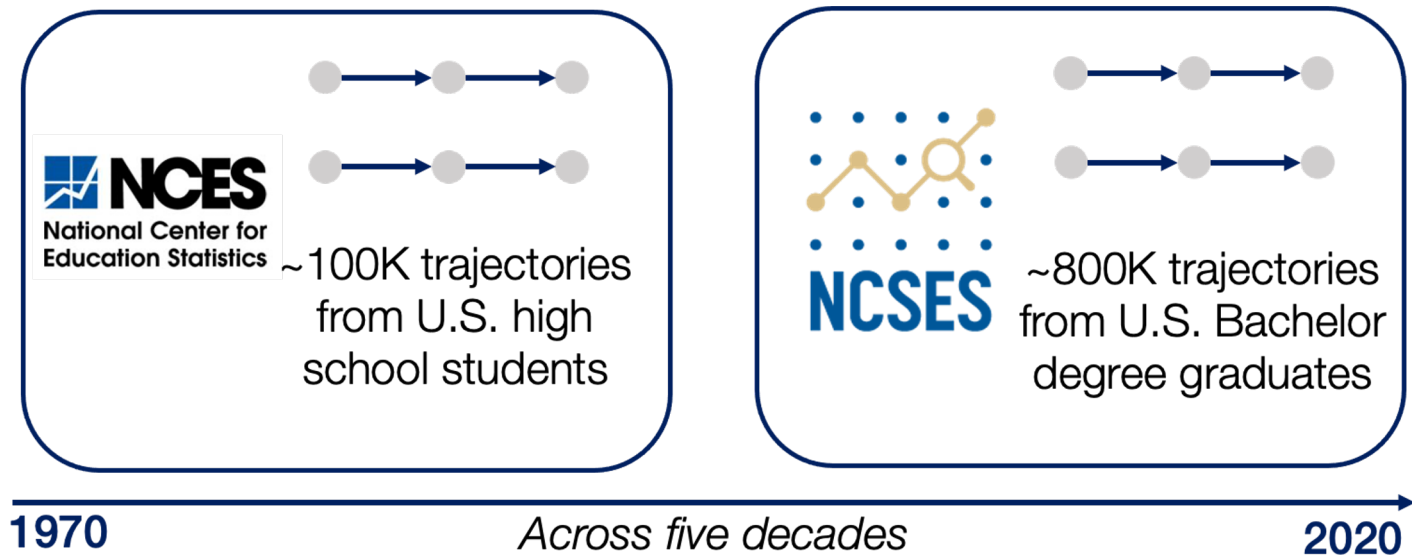


4-year program



We need a large-scale comparative analysis to better understand at which stages and institutions students from various backgrounds leave pathways to STEM.

Data



Data

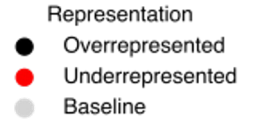
Created four comparison groups of students who:

- attended high school but did not graduate,
- graduated high school but did not enroll in college,
- enrolled in college but did not graduate,
- graduated college

Analyzed differences in outcomes

Preliminary Results

Where is inequality in access to STEM steepest?

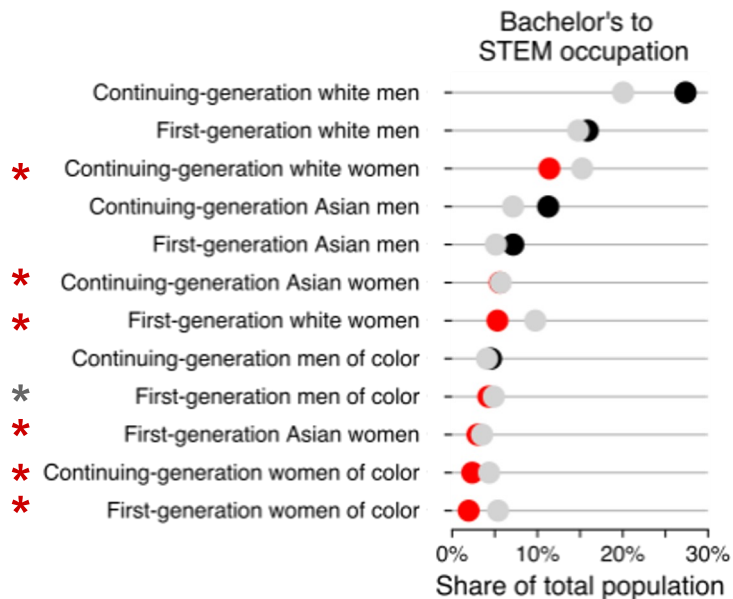


Preliminary Results

Where is inequality in access to STEM steepest?

Representation

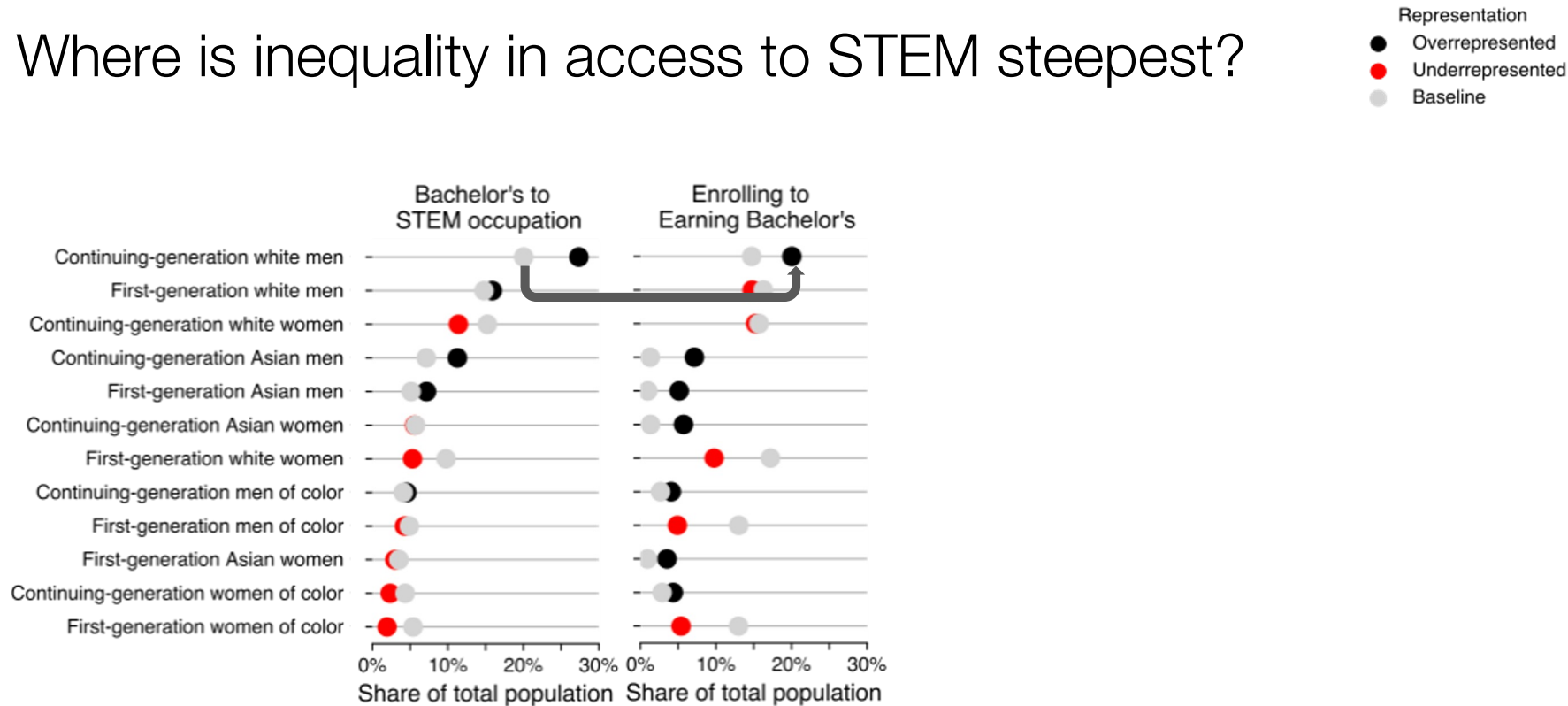
- Overrepresented
- Underrepresented
- Baseline



A single cohort, born in 1990

Preliminary Results

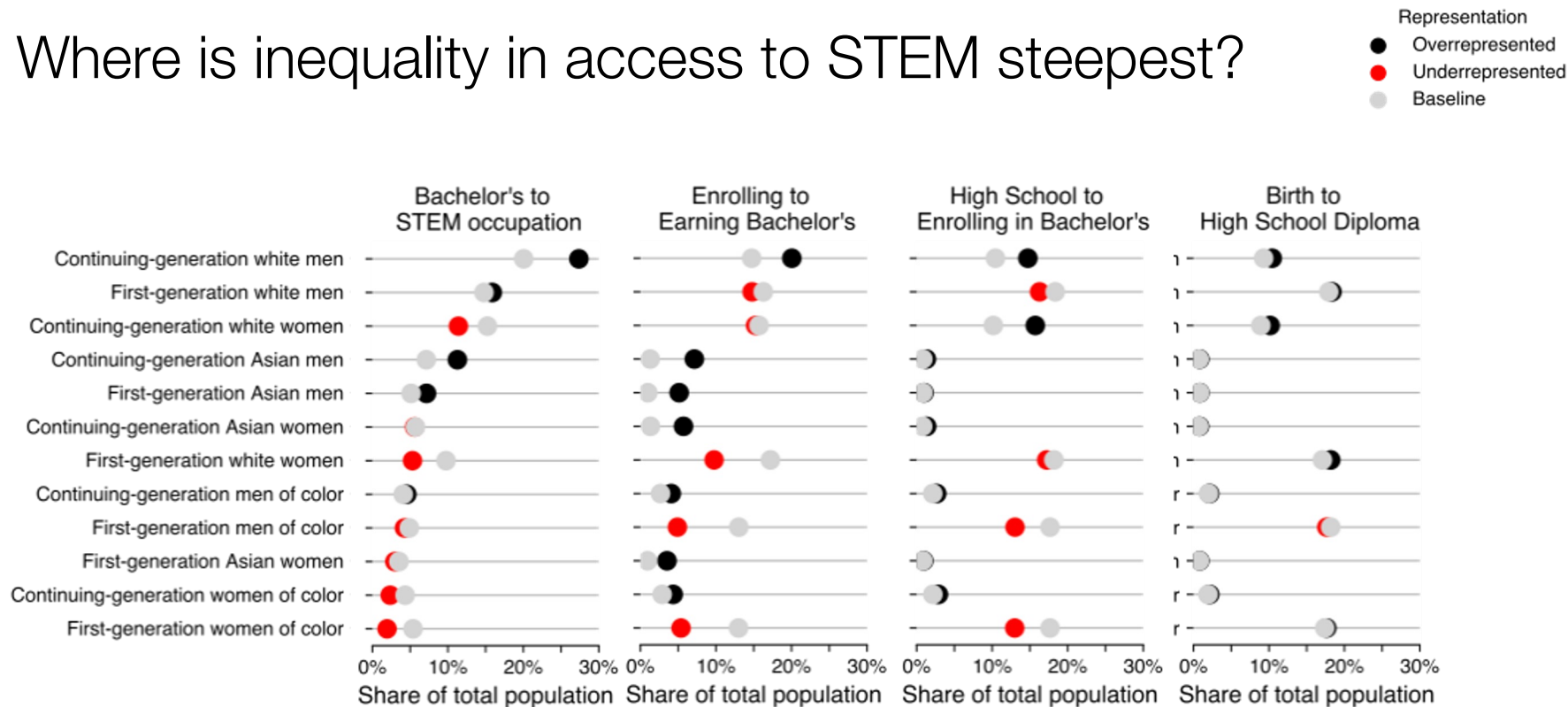
Where is inequality in access to STEM steepest?



A single cohort, born in 1990

Preliminary Results

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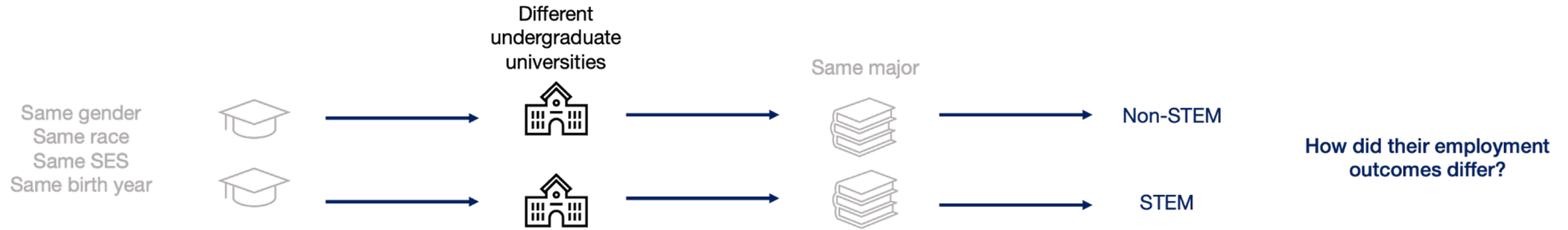


Higher education plays a huge role!

A single cohort, born in 1990

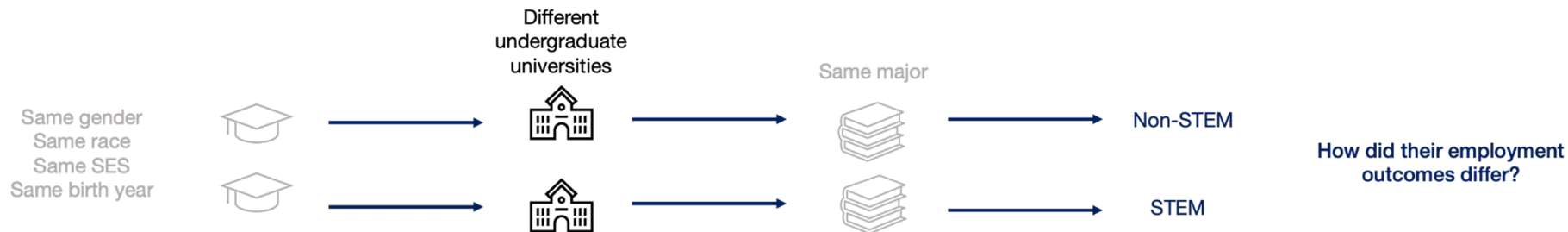
Preliminary Results

How is institutional prestige associated with STEM employment?



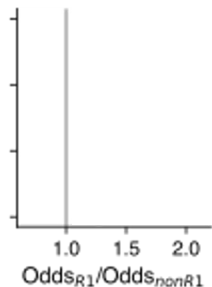
Preliminary Results

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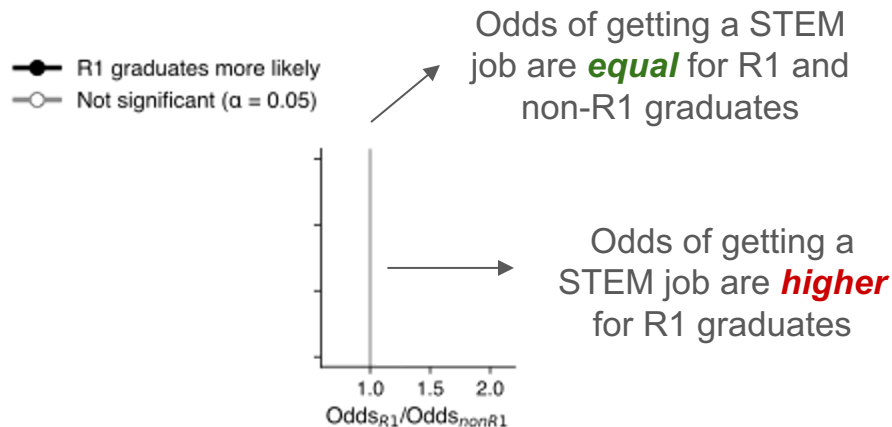
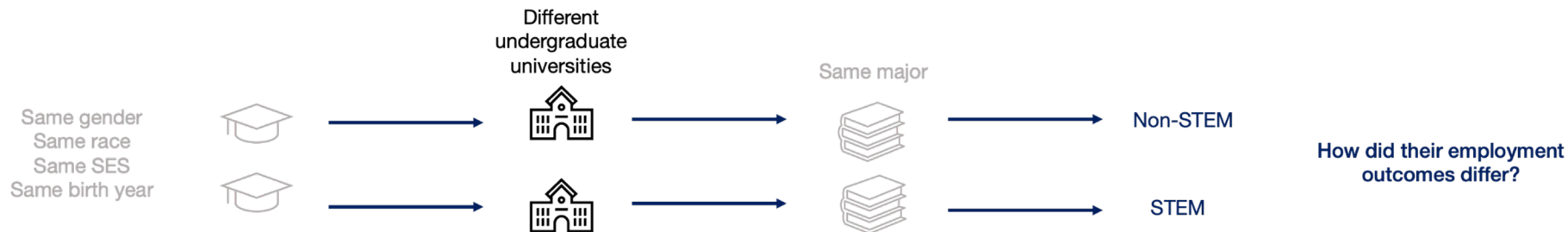
● R1 graduates more likely
○ Not significant ($\alpha = 0.05$)

Odds of getting a STEM job are **equal** for R1 and non-R1 graduates



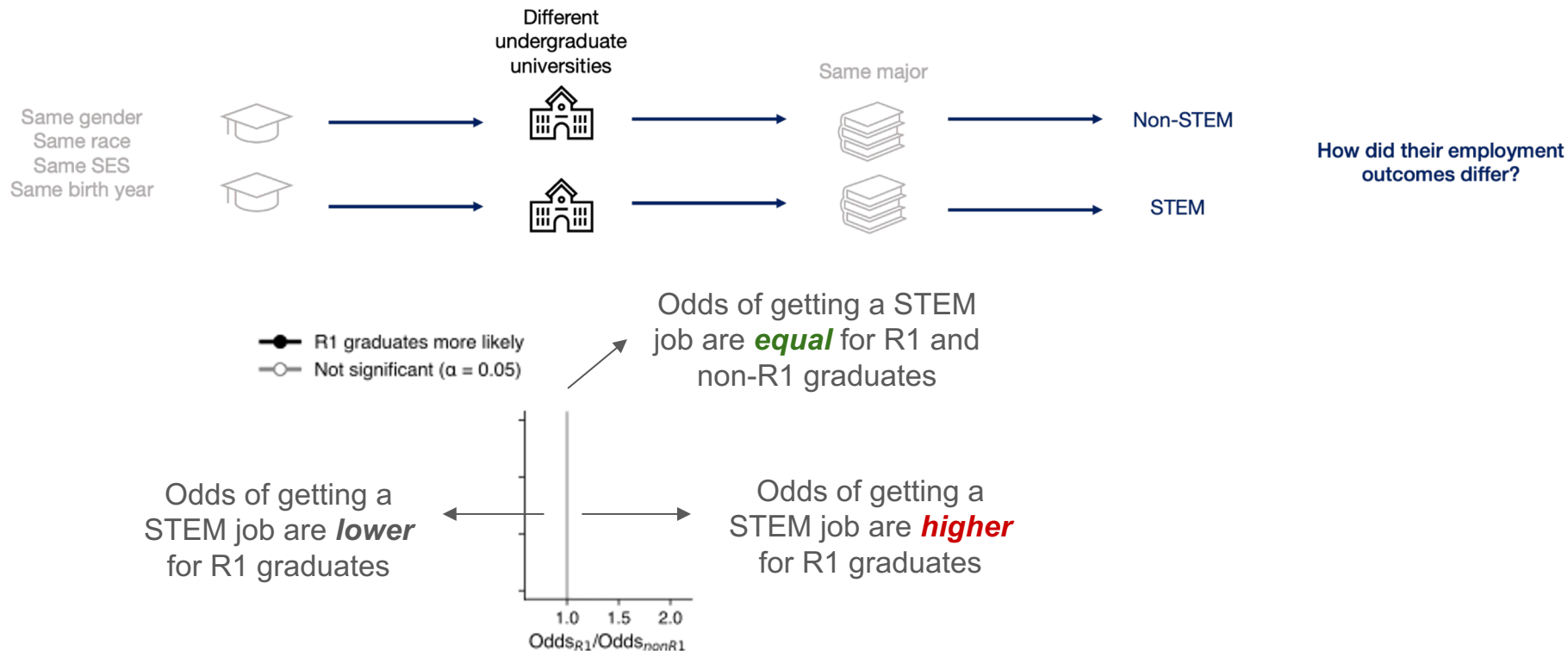
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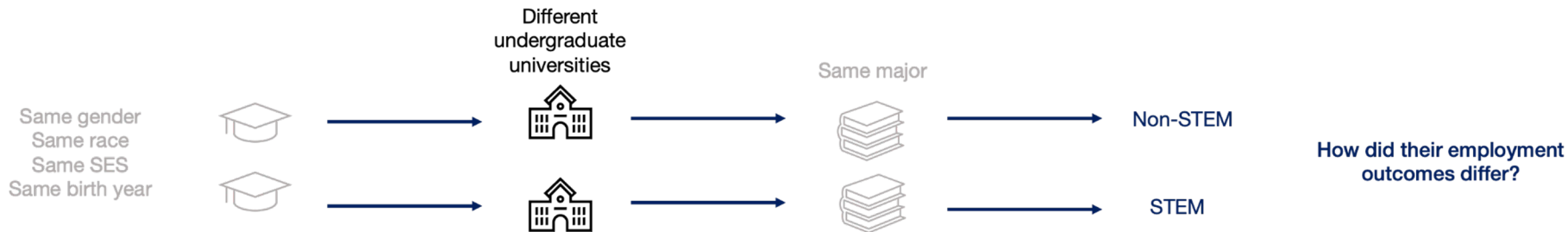
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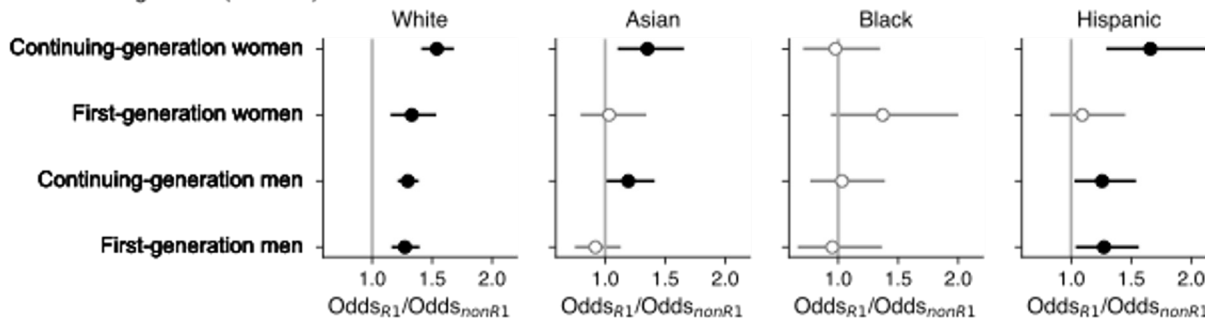


Preliminary Results

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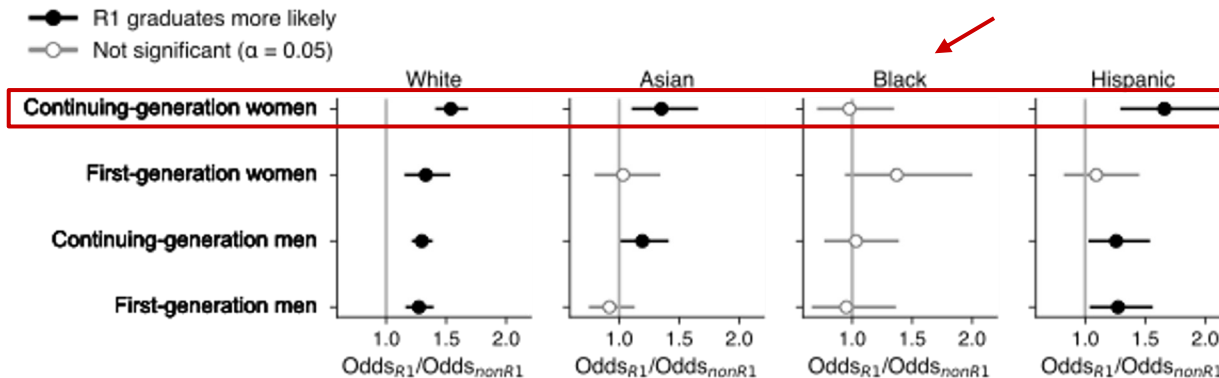
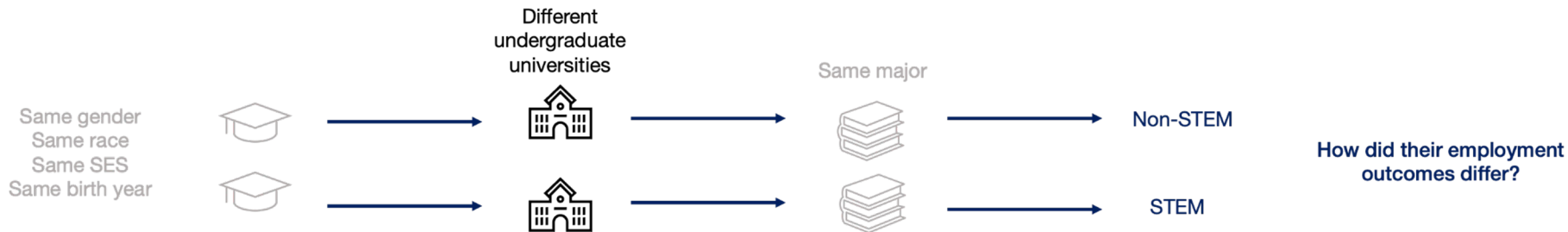


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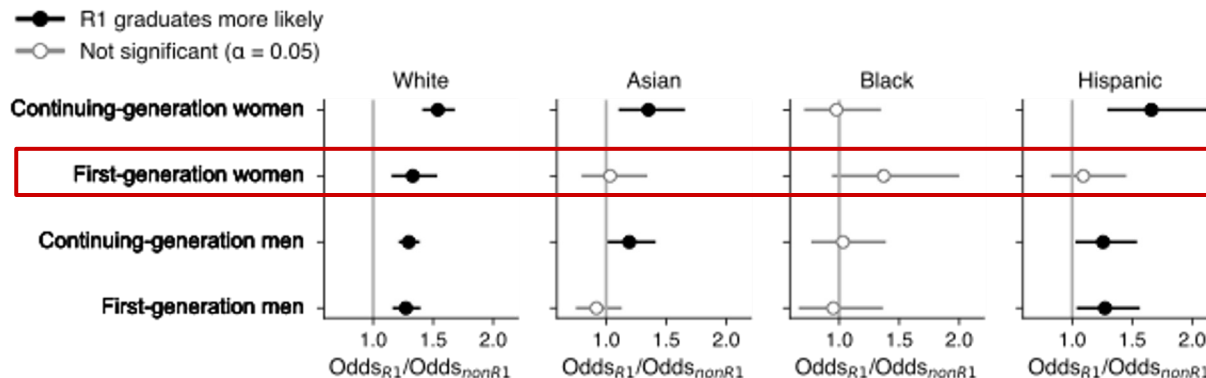
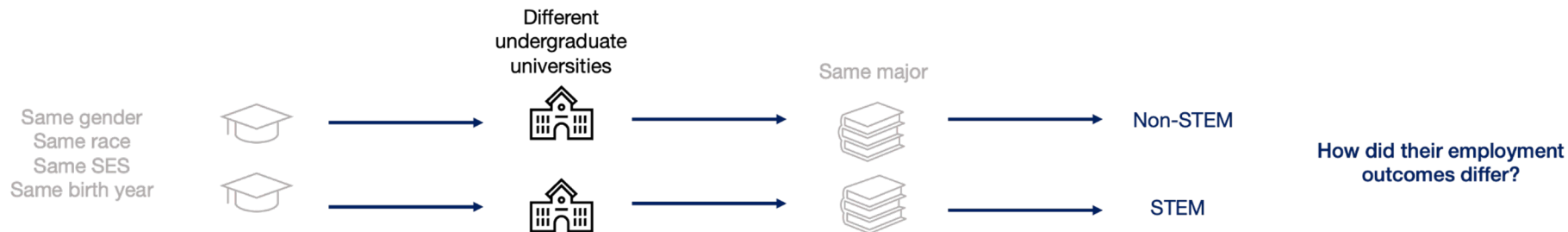
Preliminary Results

How is institutional prestige associated with STEM employment?



Preliminary Results

How is institutional prestige associated with STEM employment?



Takeaways

- This is not only a “pipeline problem”, higher education plays a huge role
- Not all students benefit equally from institutional prestige when it comes to STEM employment
- Other institutions likely play an important role in facilitating access to STEM careers

Next steps: more detailed data from NCSES and the U.S. Census Bureau, network analyses, comparisons across different types of STEM jobs

Thanks!

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