BACKGROUND
- US policymakers claim that the US is not producing enough STEM degree-holders to keep up with economic and global growth (Williams, George-Jones, & Hebl, 2018).
- Between 2012 & 2022, US jobs will grow in almost all areas of science, math, and technology (Doerschuk et al., 2016).
  - However, US bachelor’s degrees earned have remained steady (Doerschuk et al., 2016).
- Rates of completion of STEM degrees are notably lower in African-American, Latinx, and Native American students (Williams, George-Jones, & Hebl, 2018).
- Underrepresented minority (URM) college students are interested in STEM majors, but leave at a higher rates (Williams, George-Jones, & Hebl, 2018).
- White and Asian students are more “college ready” compared to Black, Latinx, and Native American students (Strayhorn, 2014).
- The achievement gap between minorities and non-minorities starts as early as kindergarten and becomes wider in higher education and academia (Qian et al., 2017).

PURPOSE & HYPOTHESES
To investigate the difference in statistical reasoning gains between underrepresented minority (URM) and non-minority students in a quantitative psychology course.

HYPOTHESIS 1: URM students will have smaller gains in statistical reasoning over the semester compared to non-URM students.

HYPOTHESIS 2: URM students will also have lower baseline basic arithmetic scores as well as lower overall grades in the class.

METHOD
N=107
Fall 2018 (2 sections) & Spring 2019 (3 sections)

Demographics
- Age: M=21.69, SD=3.60
- 81.3% Female
- 58.9% First Gen, 60.7% Commuters, 55.1% Transfers, 99.1% full-time

Measures
- General Statistical Reasoning Quizzes x3 (7-9 items)
- Baseline Arithmetic Assessment (10 items)

RESULTS

HYpothesis 1 (Figure 1)
a) URM students scored significantly lower compared to non-URM students, F(1,105)=11.89, p=.001, partial eta square=.102. This indicates a moderate effect of ethnicity.
b) URM students showed smaller statistical reasoning gains over the semester compared to non-URM students, F(2,210)=4.15, p=.017, partial eta squared=.038, indicating a small to moderate interaction effect.

HYpothesis 2 (Figure 2)
a) URM students scored significantly lower on a pre-course arithmetic assessment, t(103)=2.18, p=.032, d=.30. This indicates a small effect.
b) URM students scored significantly lower on final course grades, t(105)=2.197, p=.030, d=.54. This indicates a moderate effect.

CONCLUSIONS
- URM students experience smaller gains in statistical reasoning over the course of a semester in a quantitative psychology course.
  - No significant difference at baseline.
  - By the middle and end of the semester, URM students score significantly lower.
- URM students score lower on a pre-course arithmetic assessment, indicating a potential difference in mathematical readiness.
- URM students also score lower on final course grades, indicating that these discrepancies may also be playing a role in the known achievement gap.

LIMITATIONS
- Researcher-created measures for reasoning & arithmetic.
- Did not control for first-generation status.

FUTURE DIRECTIONS
- Investigate other factors related to achievement gap (e.g. first generation, college preparedness, etc.).
- Confirm achievement gap in other STEM courses.
- Validate measures for reasoning & arithmetic.

REFERENCES