

# HIGH SCHOOL STUDENT'S SCIENCE SELF-EFFICACY

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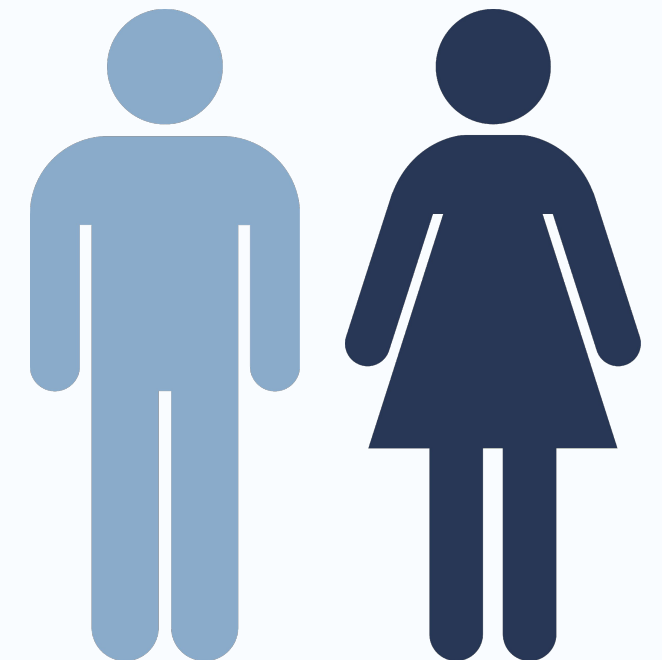
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MOTIVATION

DATASET

ANALYSIS

CONCLUSION



# Self-Efficacy

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## A BRIEF EXPLANATION



- Expectation of success in subjects
  - Achievement
    - Completing assignments
  - Persistence
    - Following track
  - Career Aspiration
    - Mastering skills taught in course



# DATASET



# Dataset

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- High School Longitudinal Study of 2009
- Nationally Representative Sample
- Most Recent
- Focus on STEM Education

# ANALYSIS

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STUDENT LEVEL

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SCHOOL LEVEL

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TEACHER LEVEL

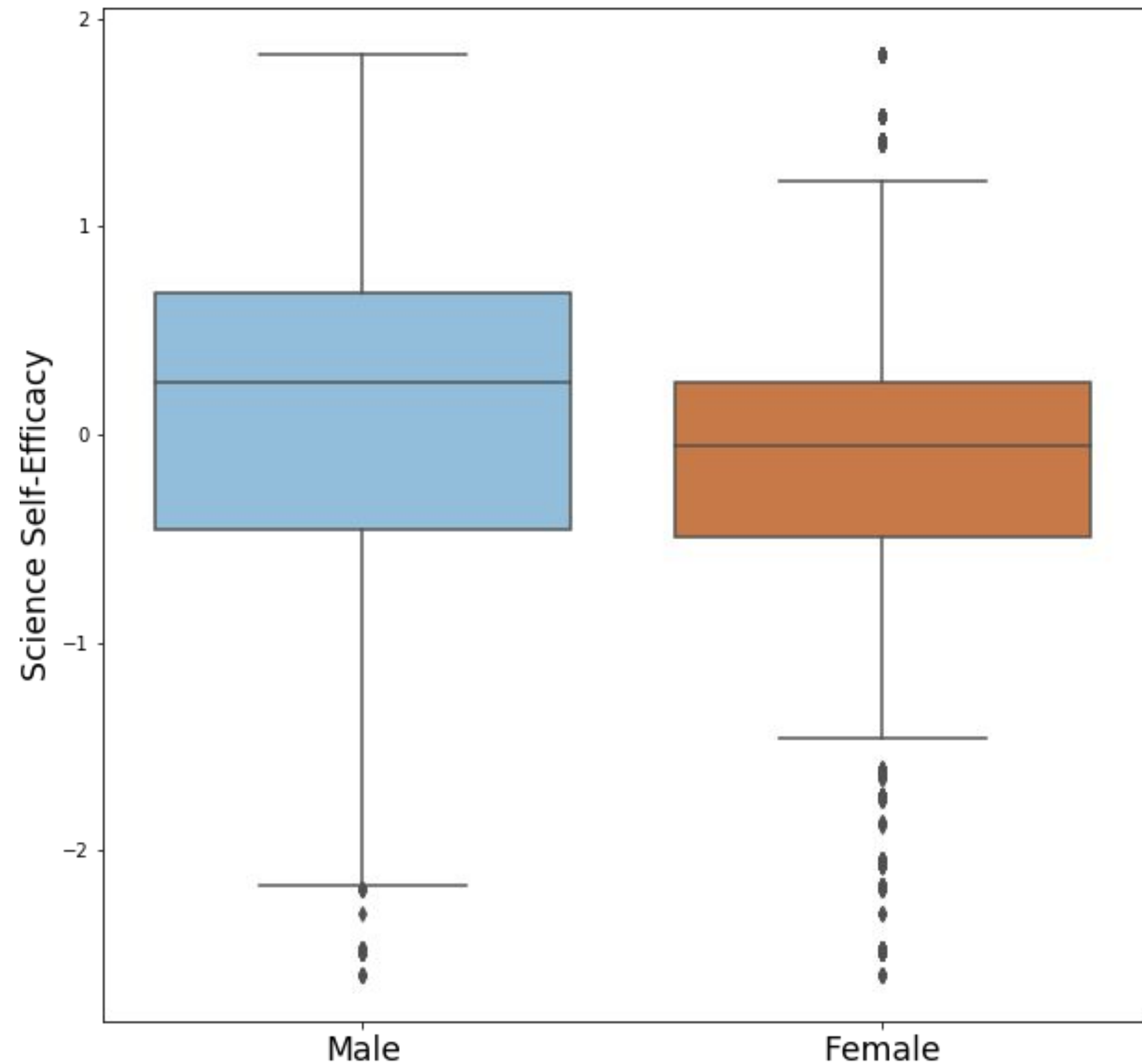
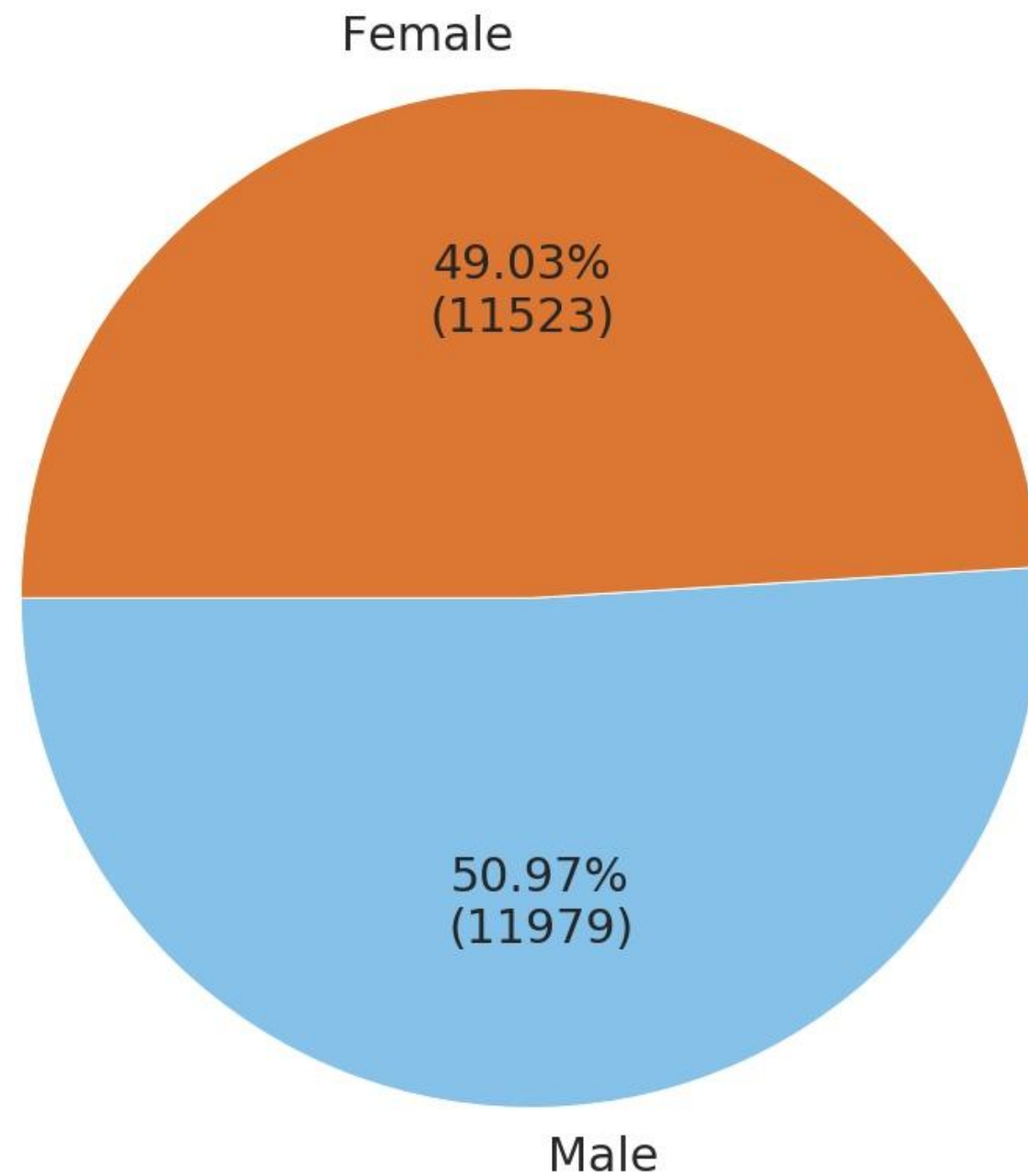
4



# STUDENT LEVEL



# Gender



- Mean Self-Efficacy: Male students > Female students
- Difference in mean is highly significant
- t-test:  $p\text{-value} \approx 2.097 \times 10^{-5}$
- Variability: Male Students > Female Students







# Science Courses

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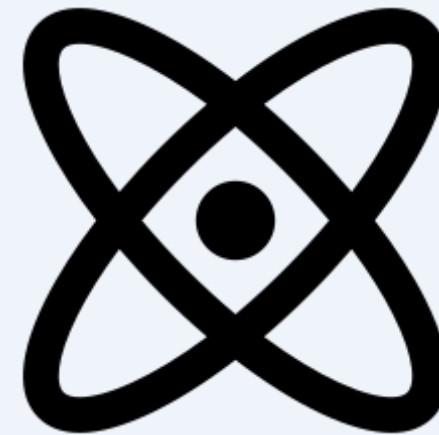
LIFE SCIENCE



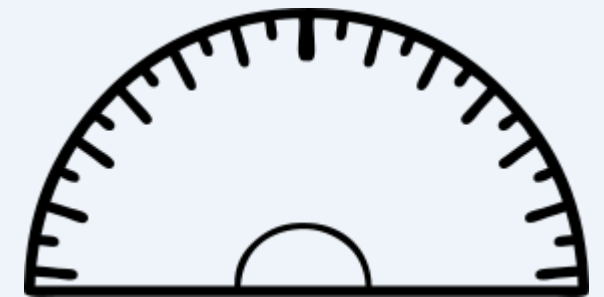
EARTH SCIENCE



PHYSICAL  
SCIENCE



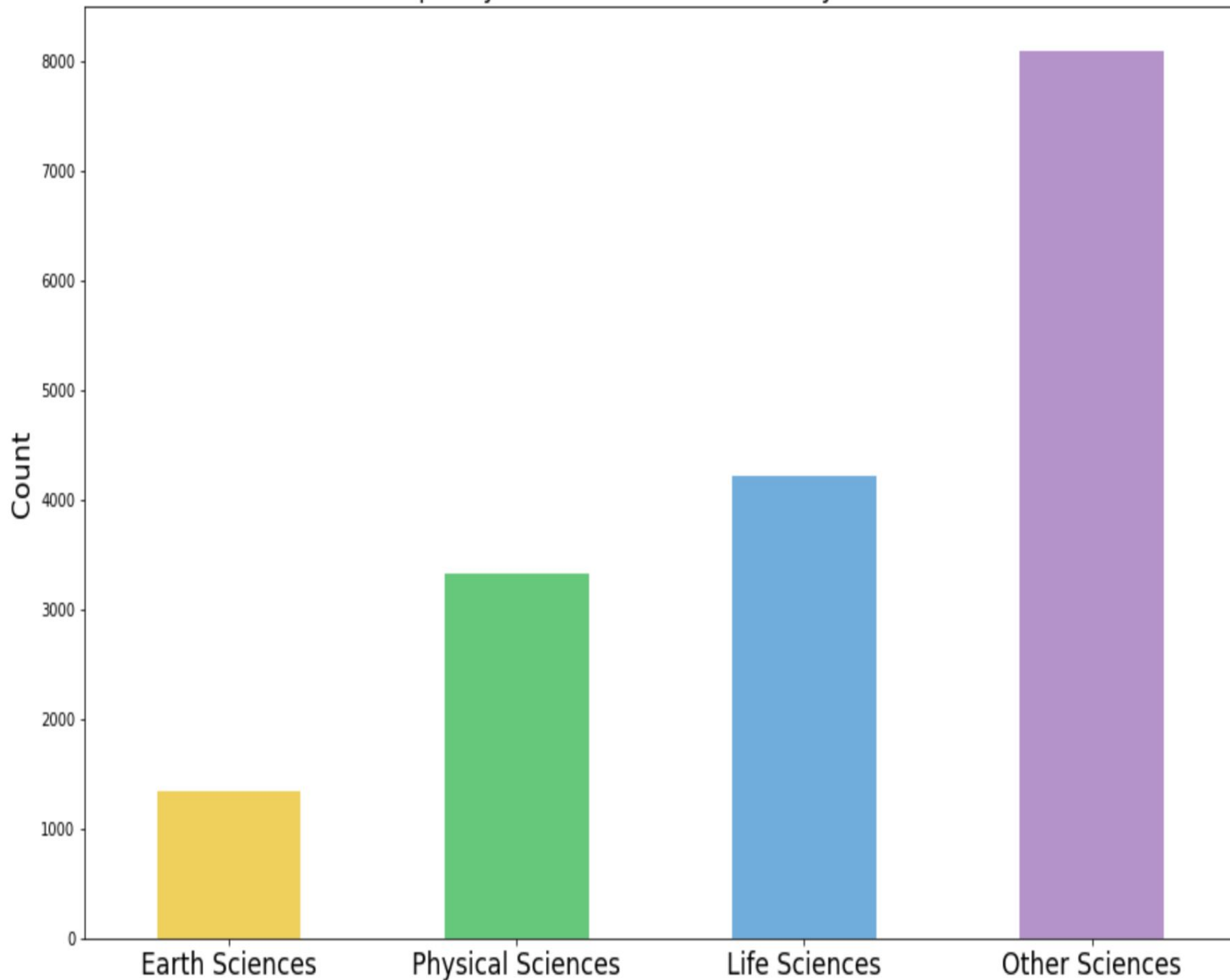
OTHER SCIENCE



# Science Courses



Frequency of Science Course Taken by Students

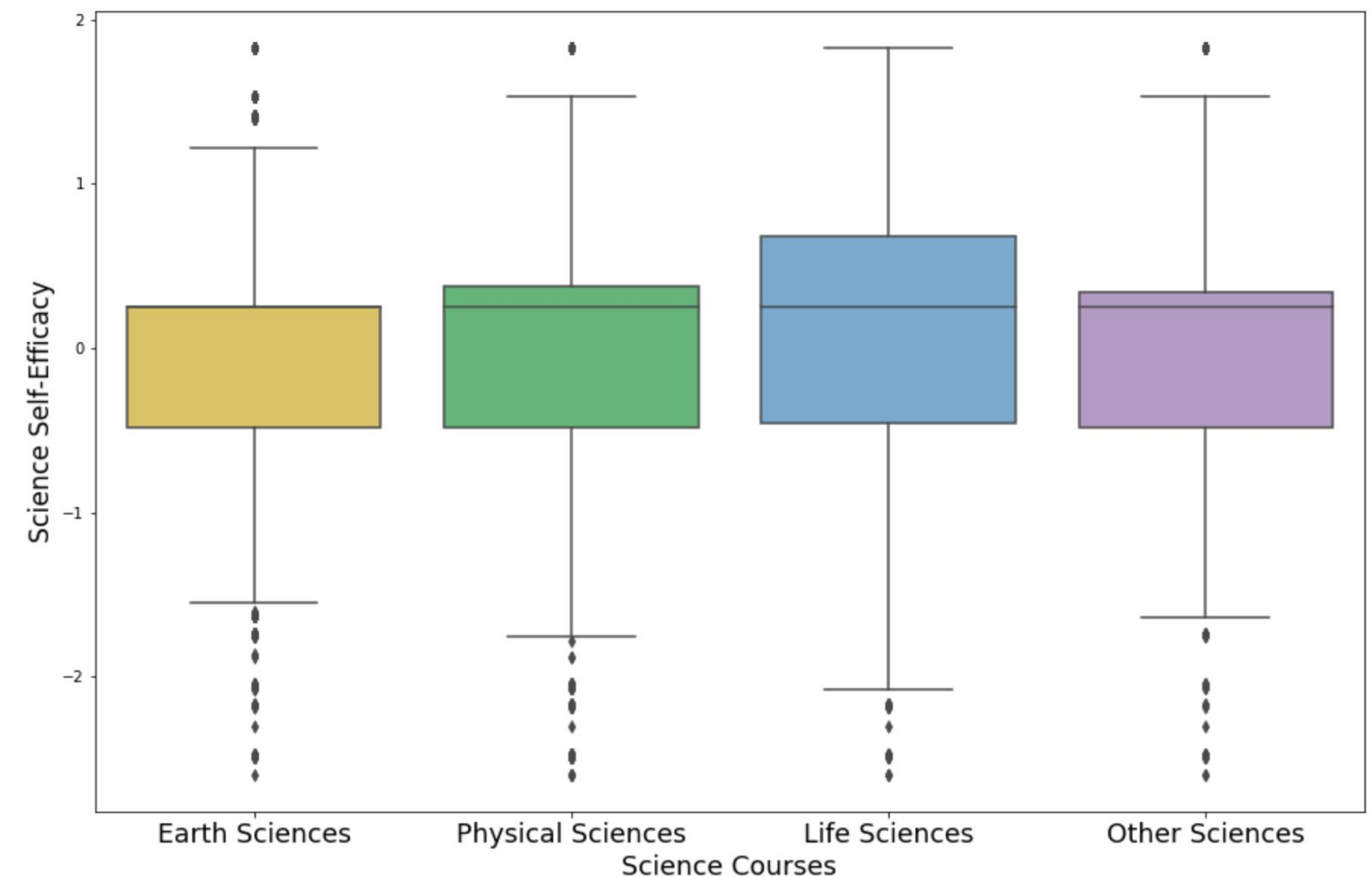


Self-Efficacy: Life Science > All Other

Variability: Life Science > All Other

Difference in group means : Highly Significant

ANOVA :  $p\text{-value} \approx 1.96 \times 10^{-7}$

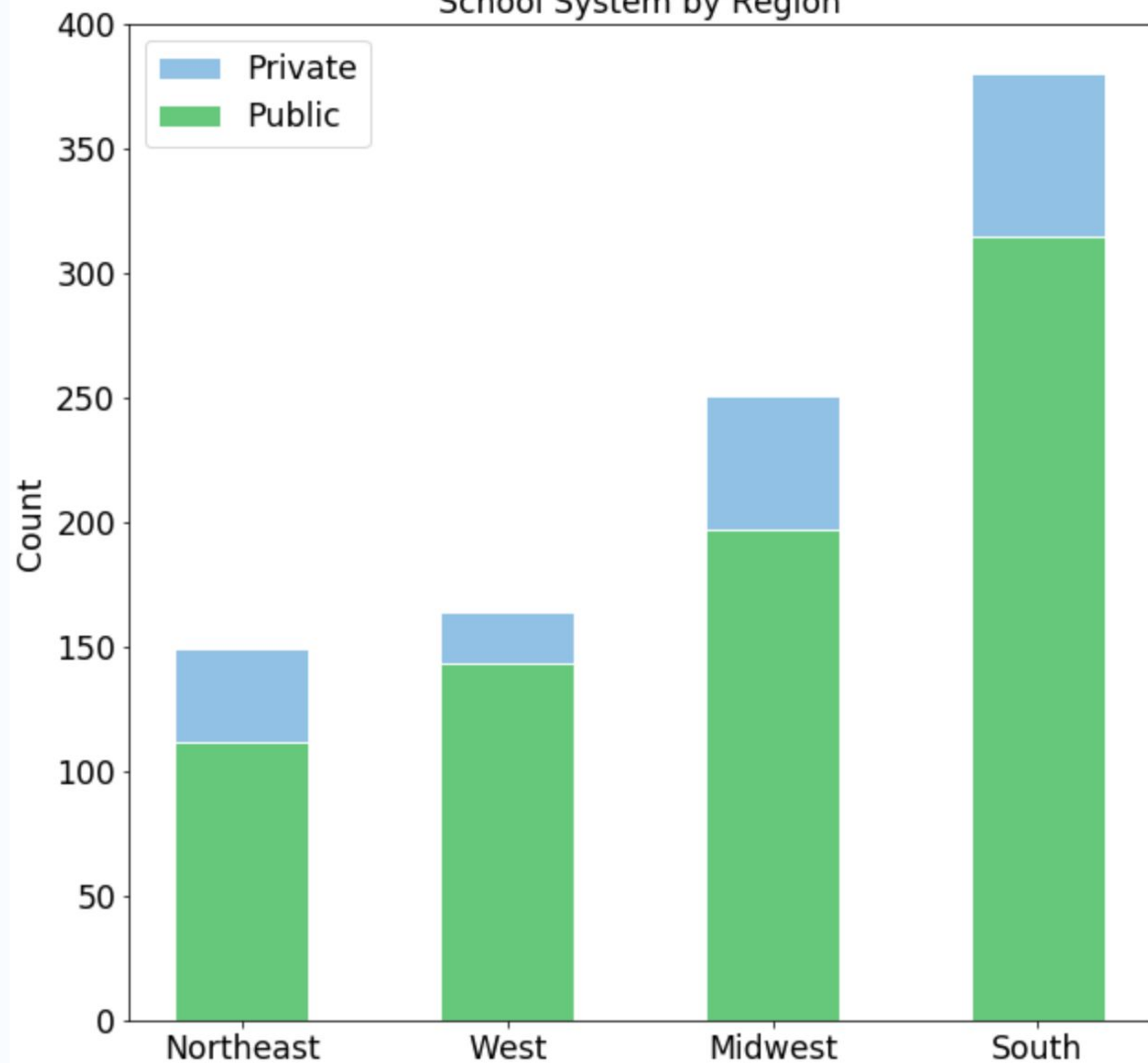




# SCHOOL LEVEL

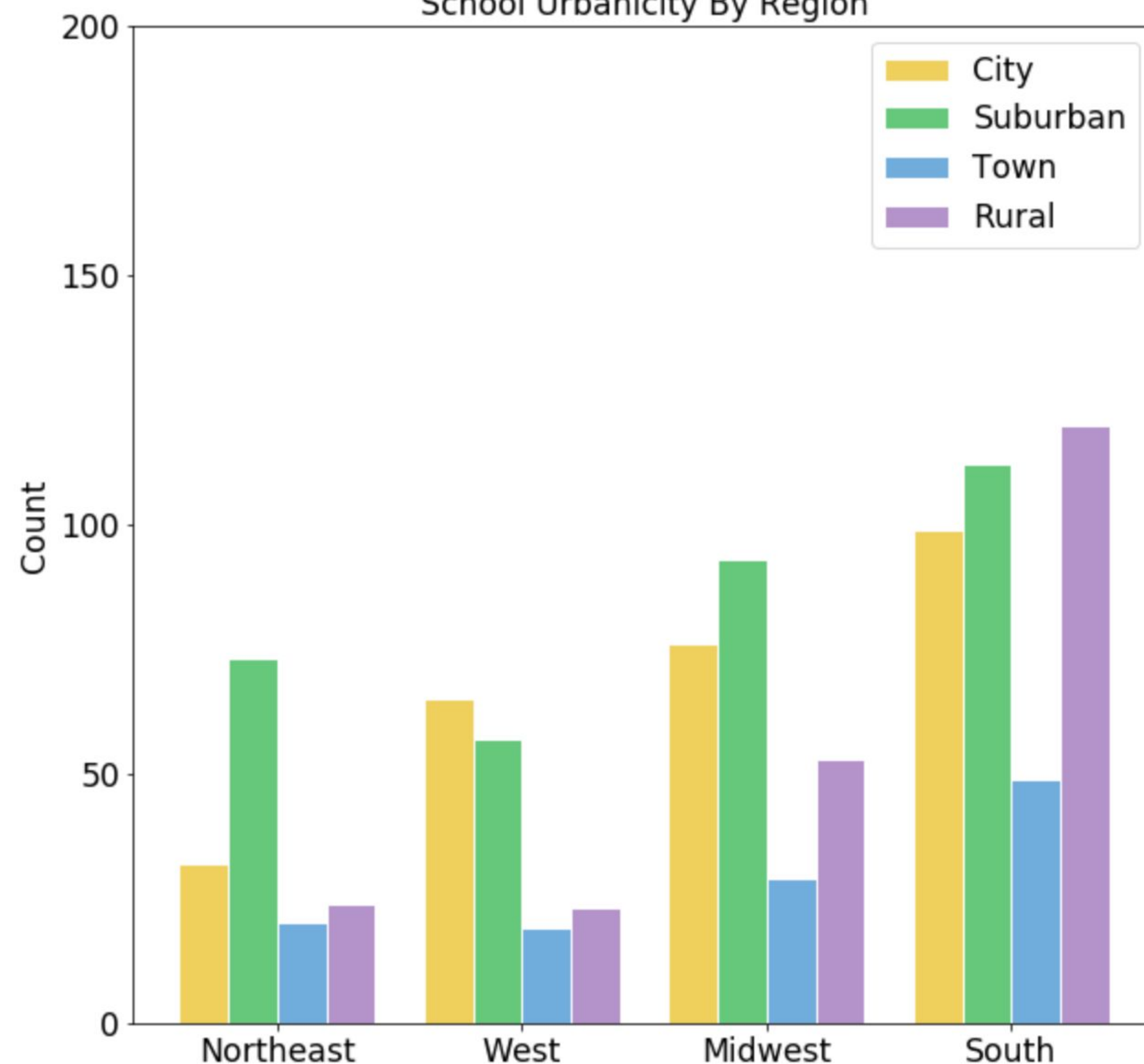


School System by Region



SCHOOL TYPE

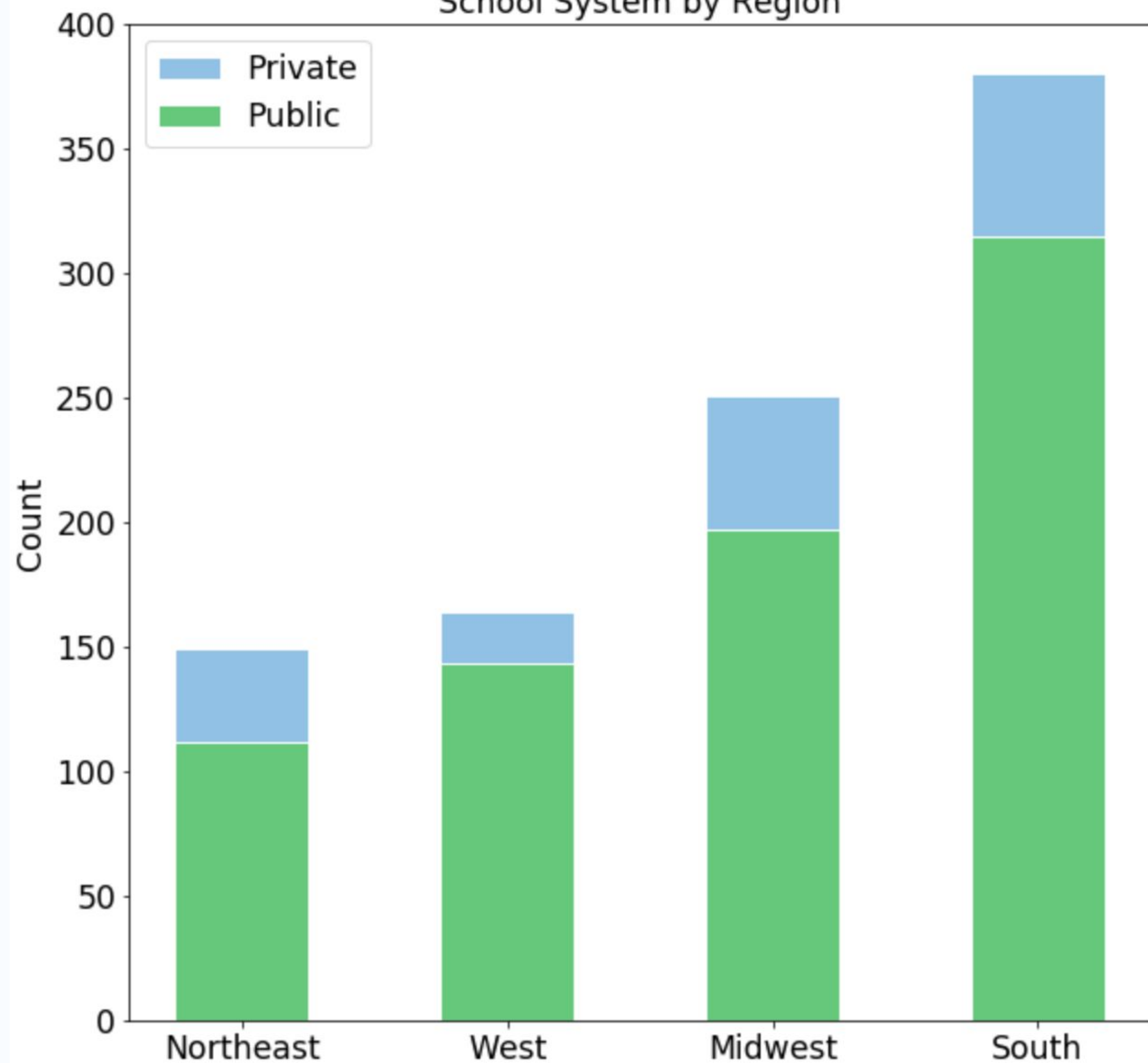
School Urbanicity By Region



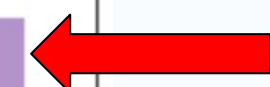
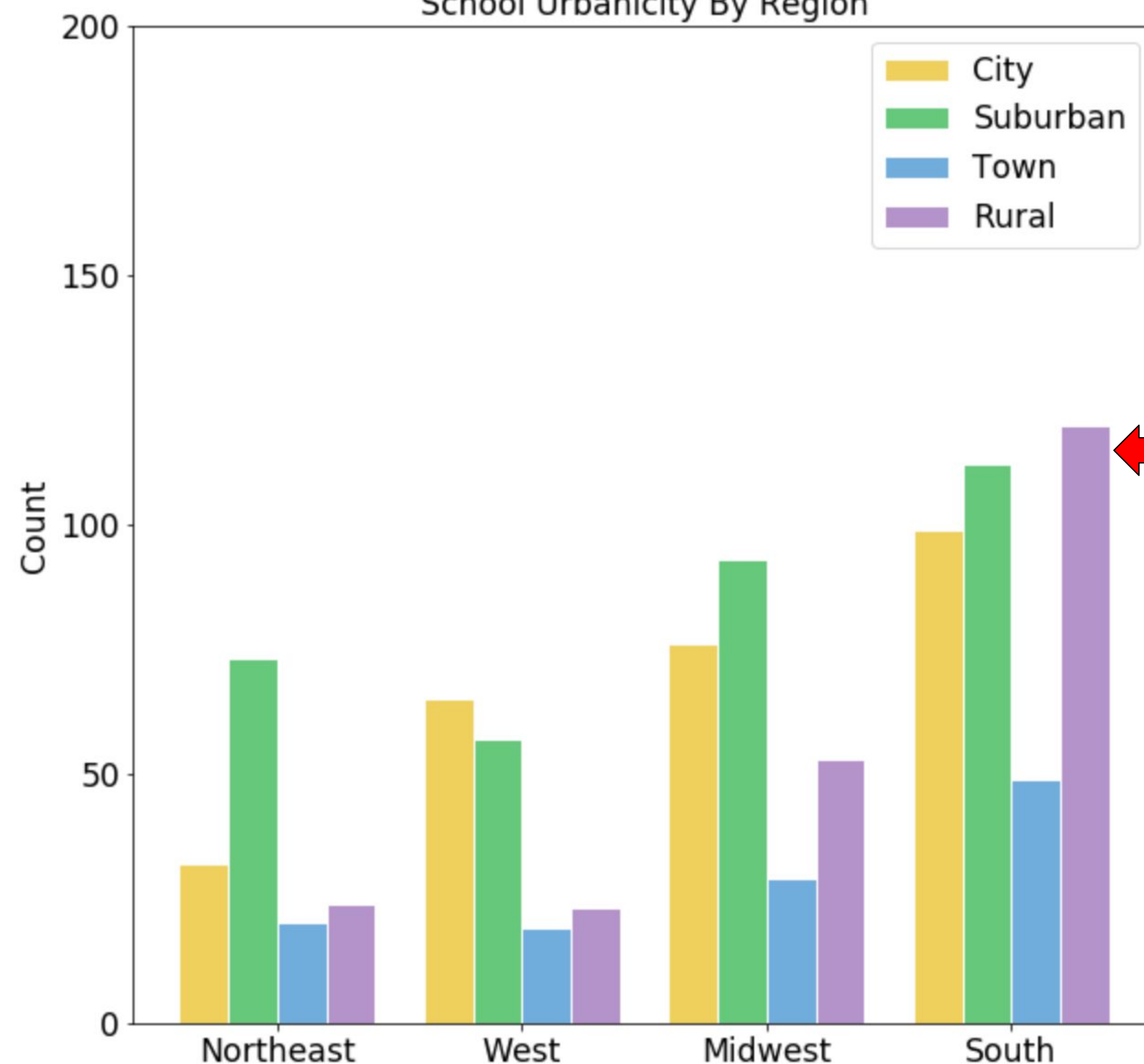
SCHOOL LOCALITY



School System by Region



School Urbanicity By Region

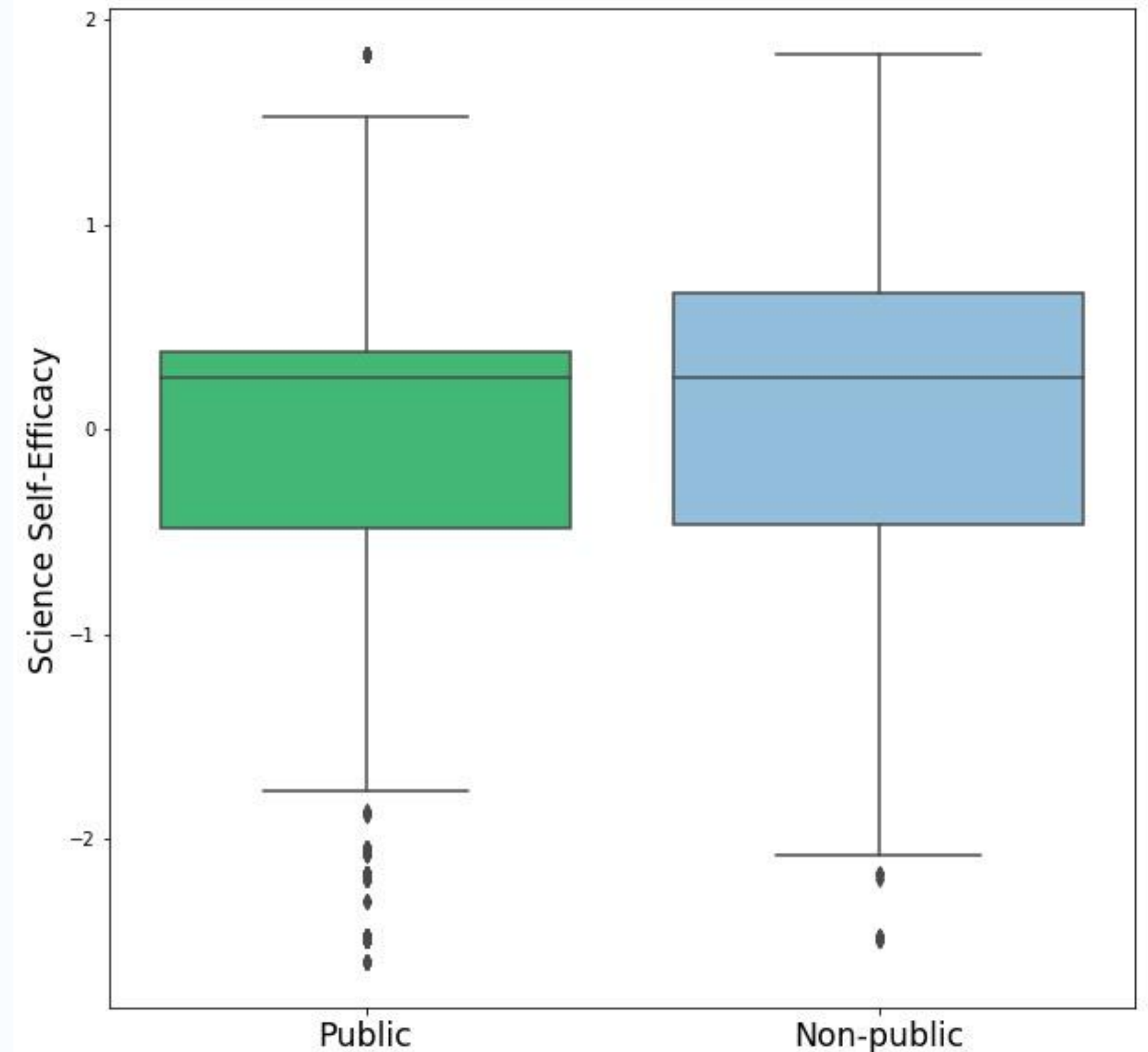
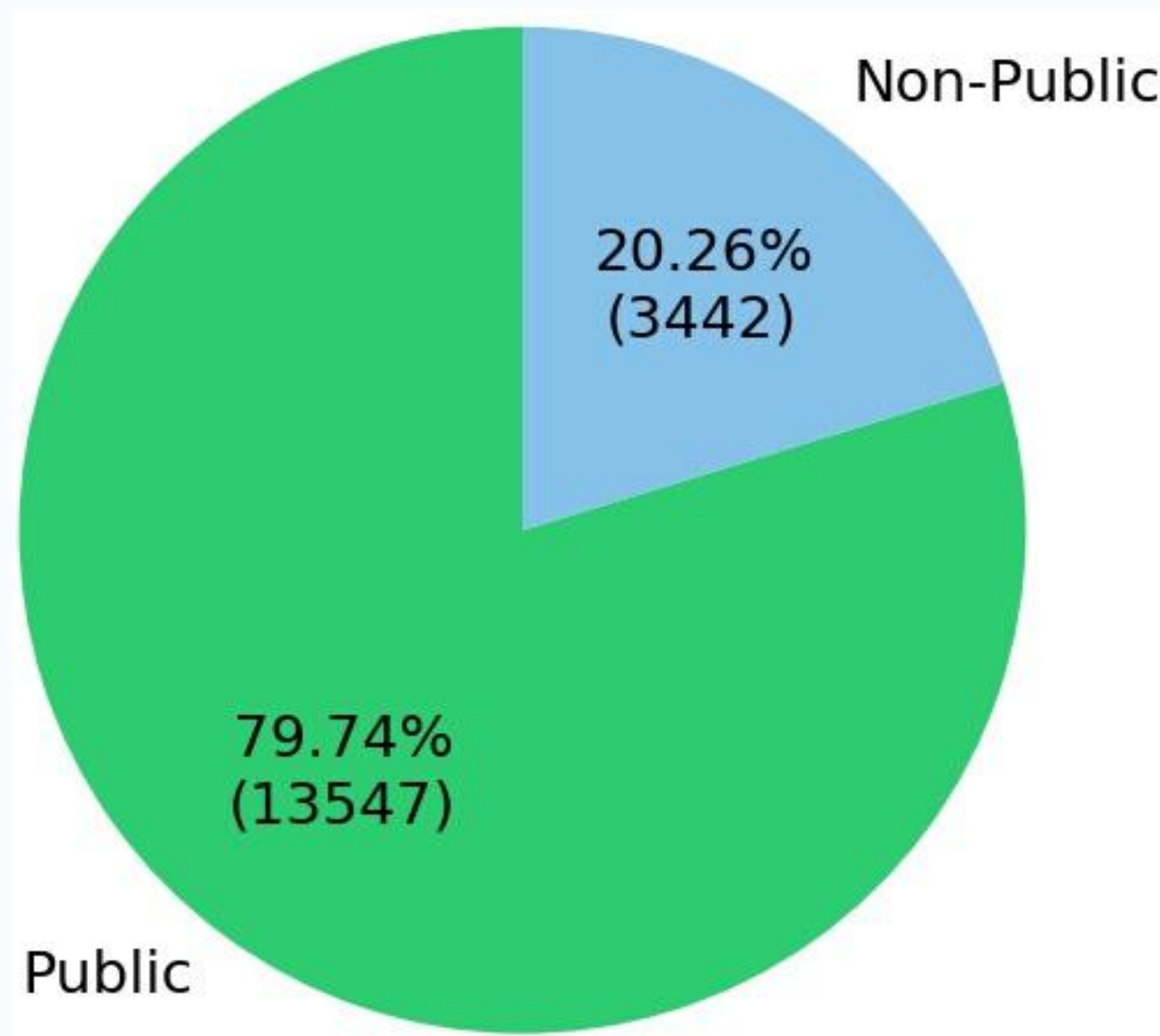


SCHOOL TYPE

SCHOOL LOCALITY



# School Type



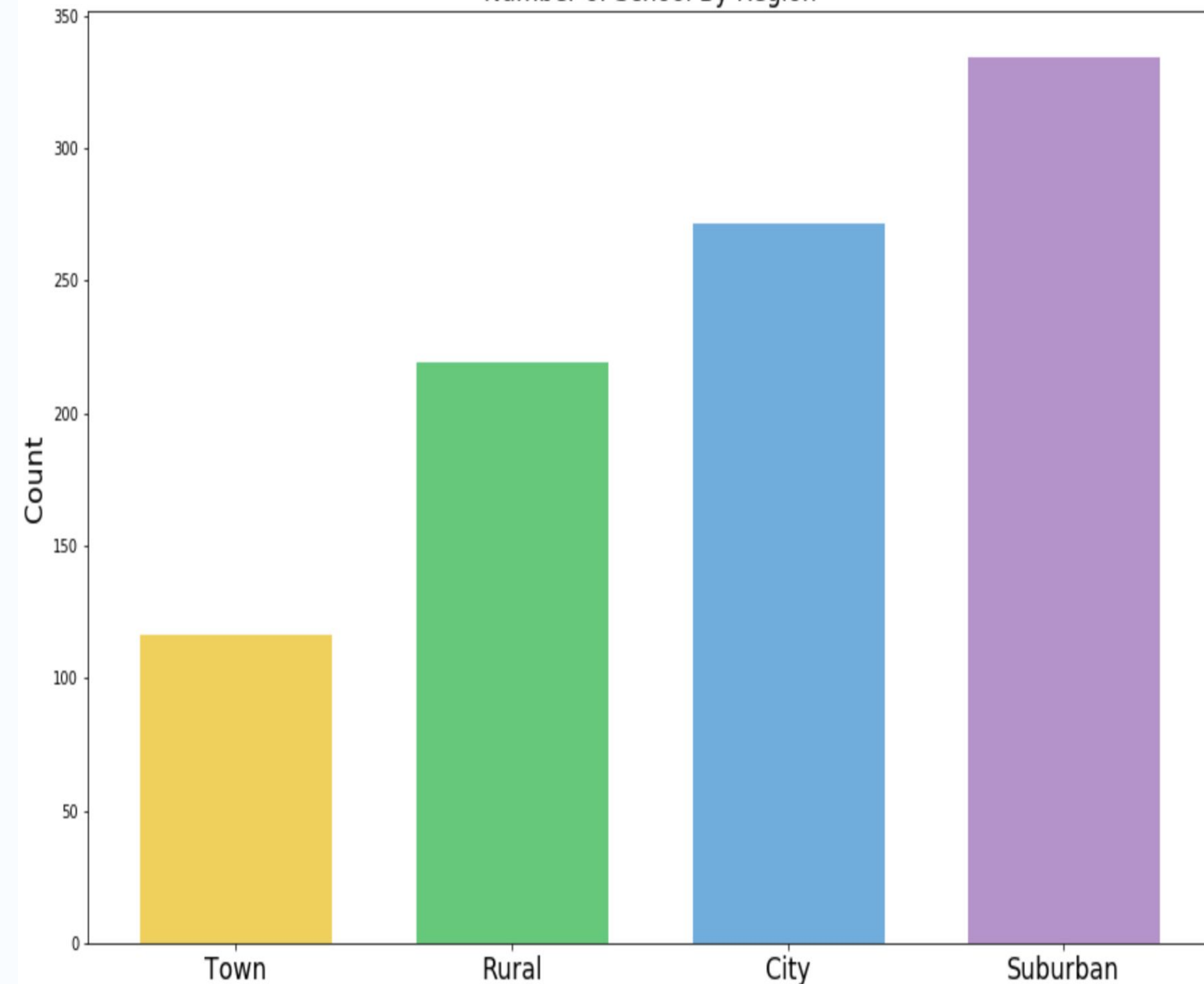
- Mean Self-Efficacy: Non-public Schools > Public Schools
- Difference in mean is highly significant
- t-test:  $p\text{-value} \approx 3.59 \times 10^{-5}$





# School Locality

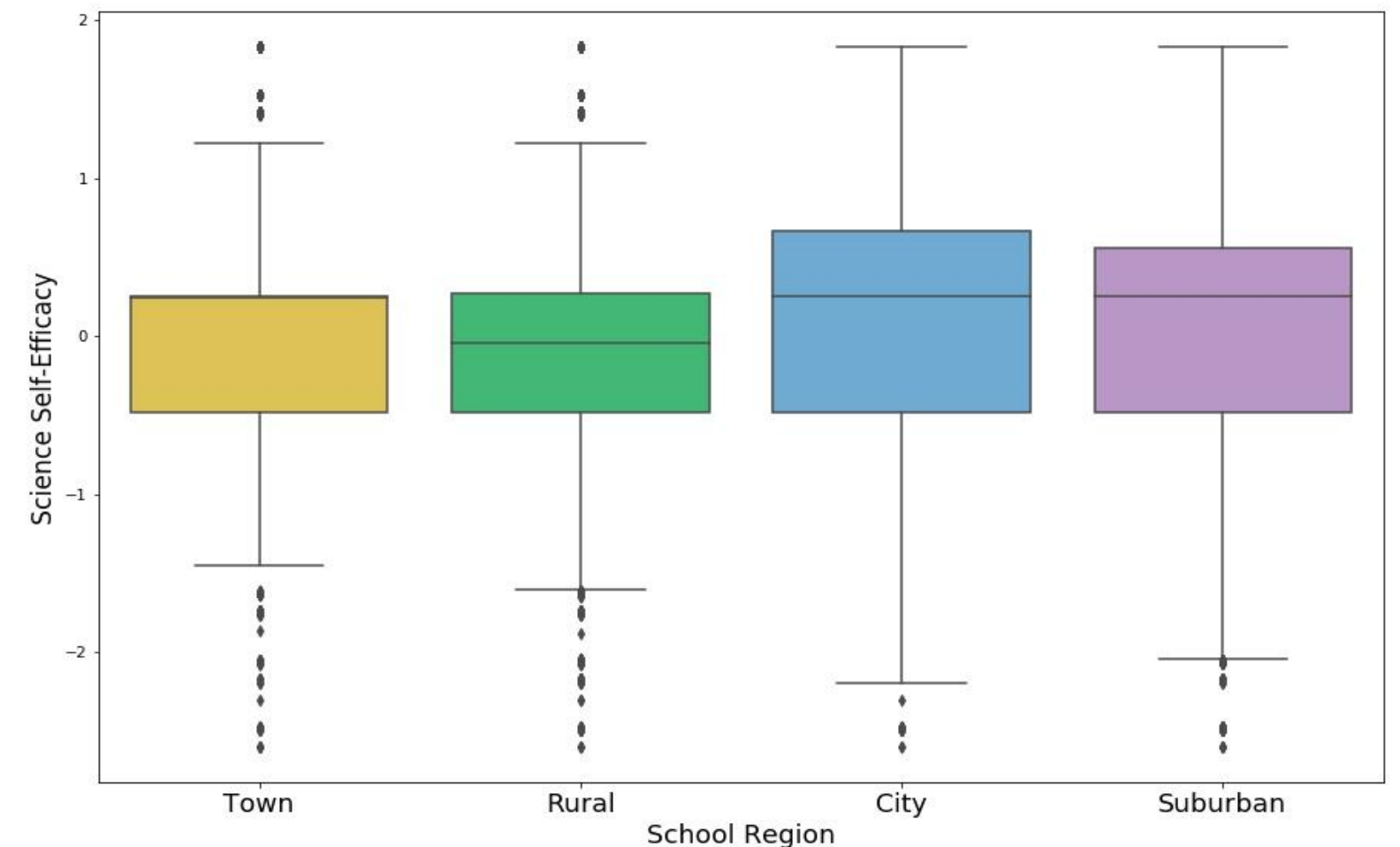
Number of School By Region



Urban school students have higher science self-efficacy than rural students.

Highly significant difference in group means

ANOVA analysis:  $p\text{-value} \approx 5.63 \times 10^{-8}$

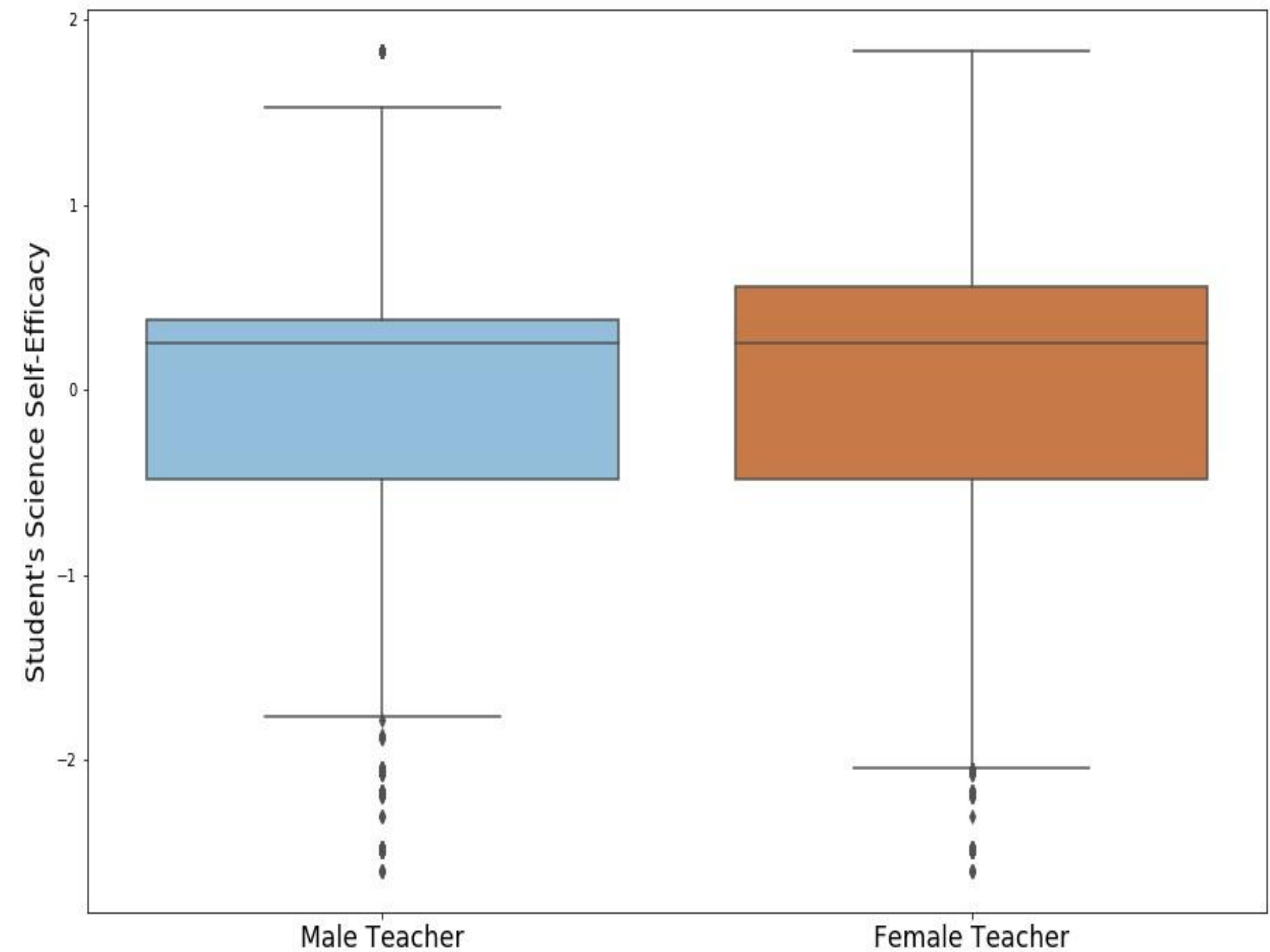
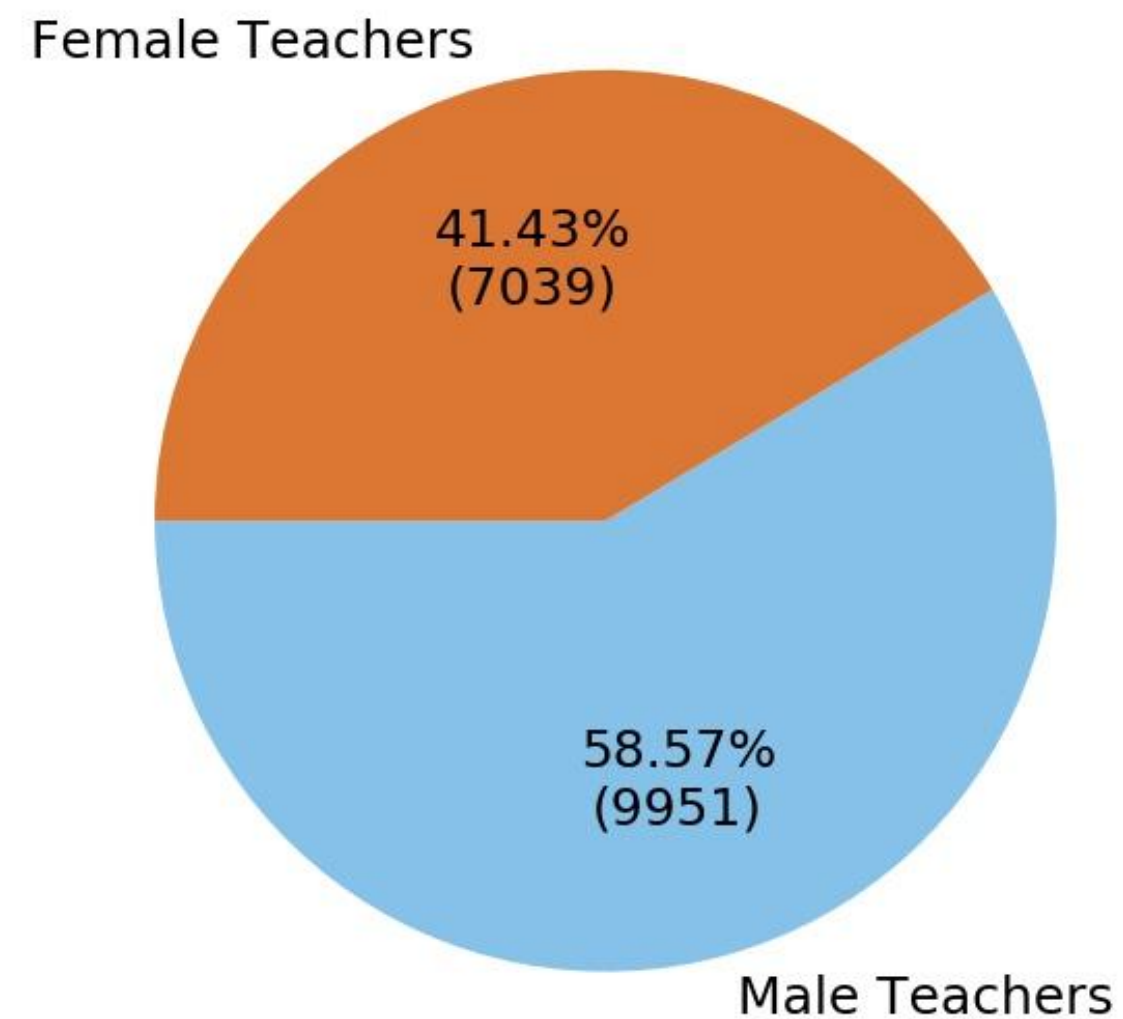






# TEACHER LEVEL

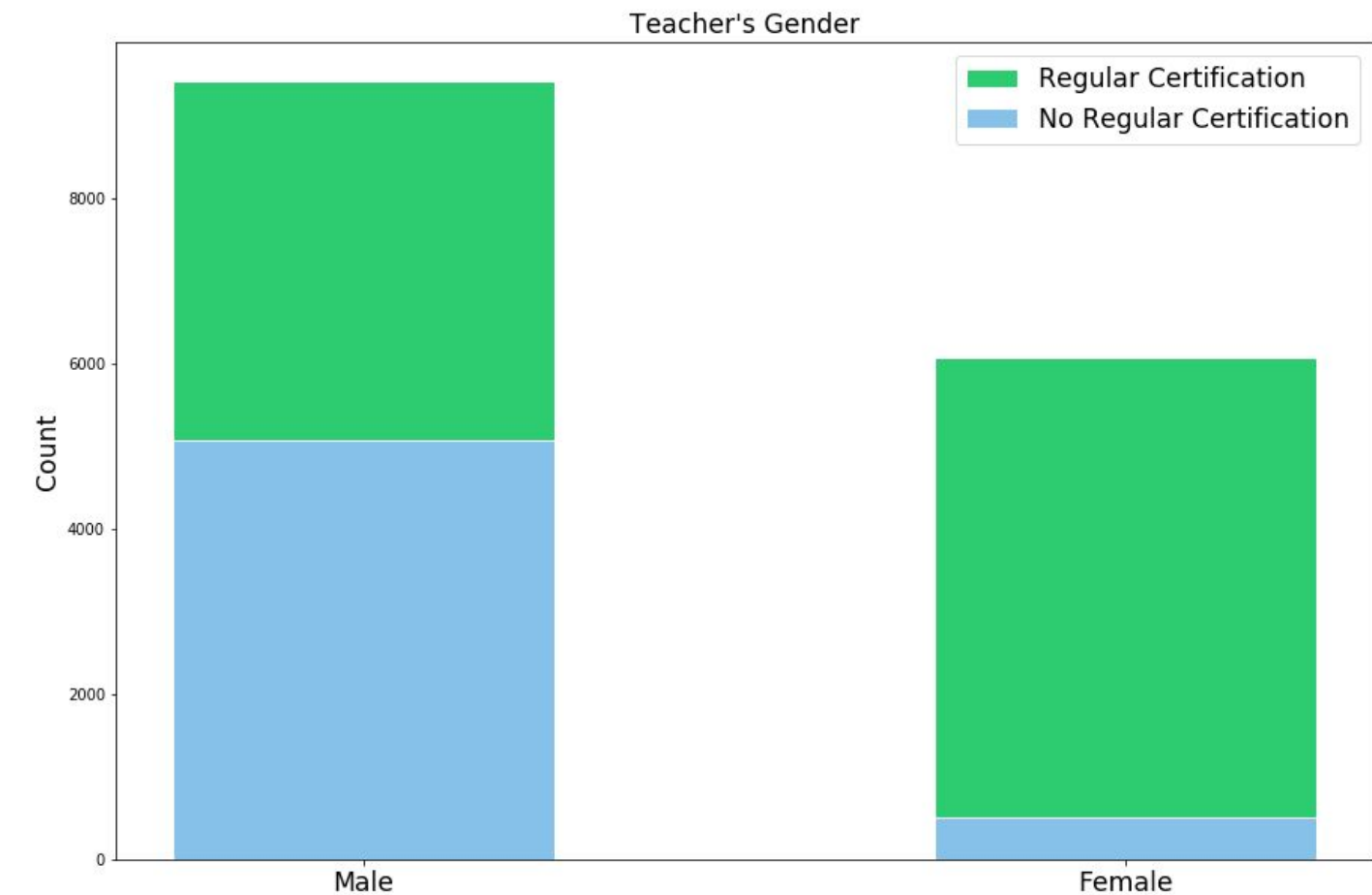
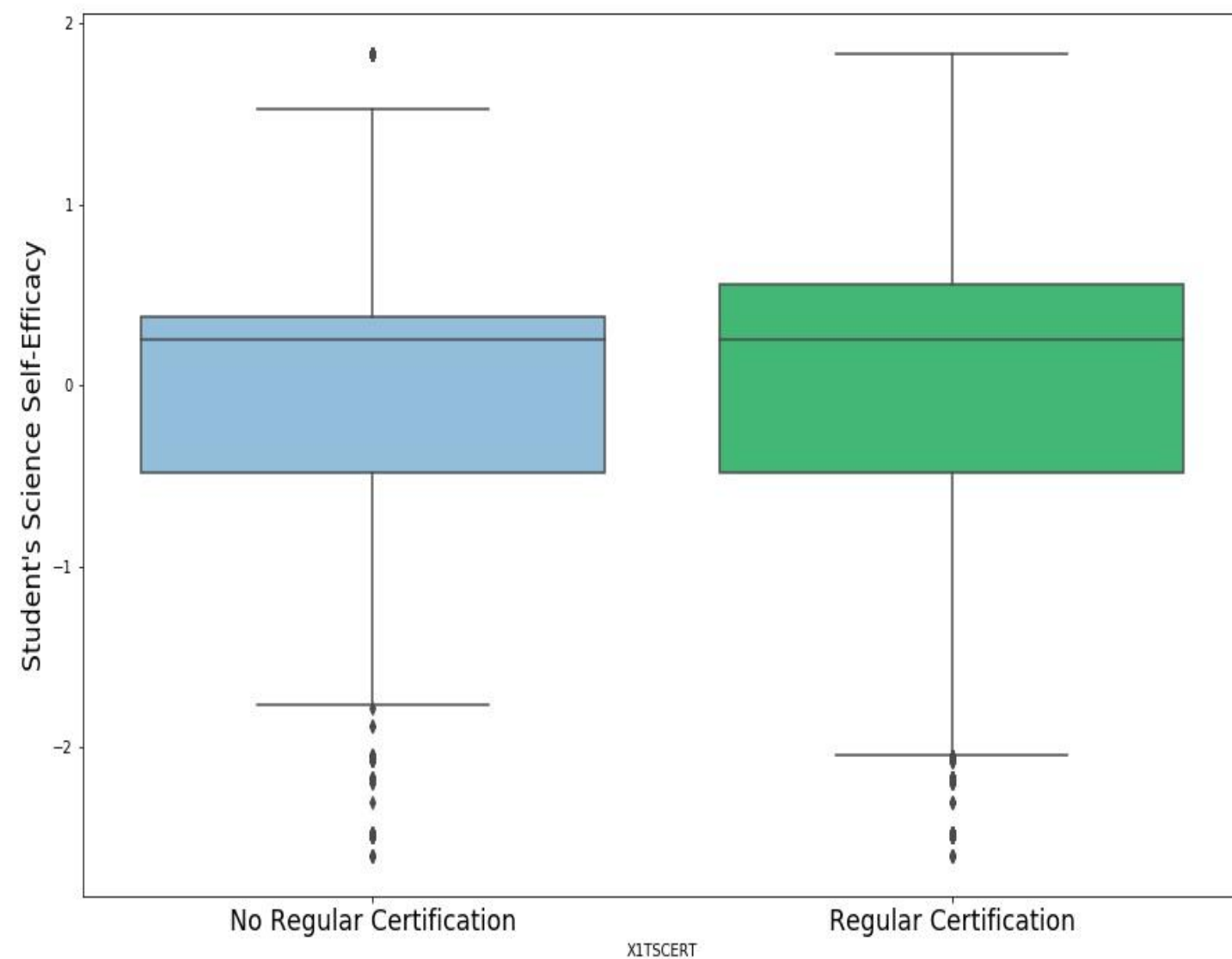
# Gender



- Mean Self-Efficacy: Female teacher > Male teacher
- t-test: p-value $\approx$ 0.006
- Variability: Female > Male

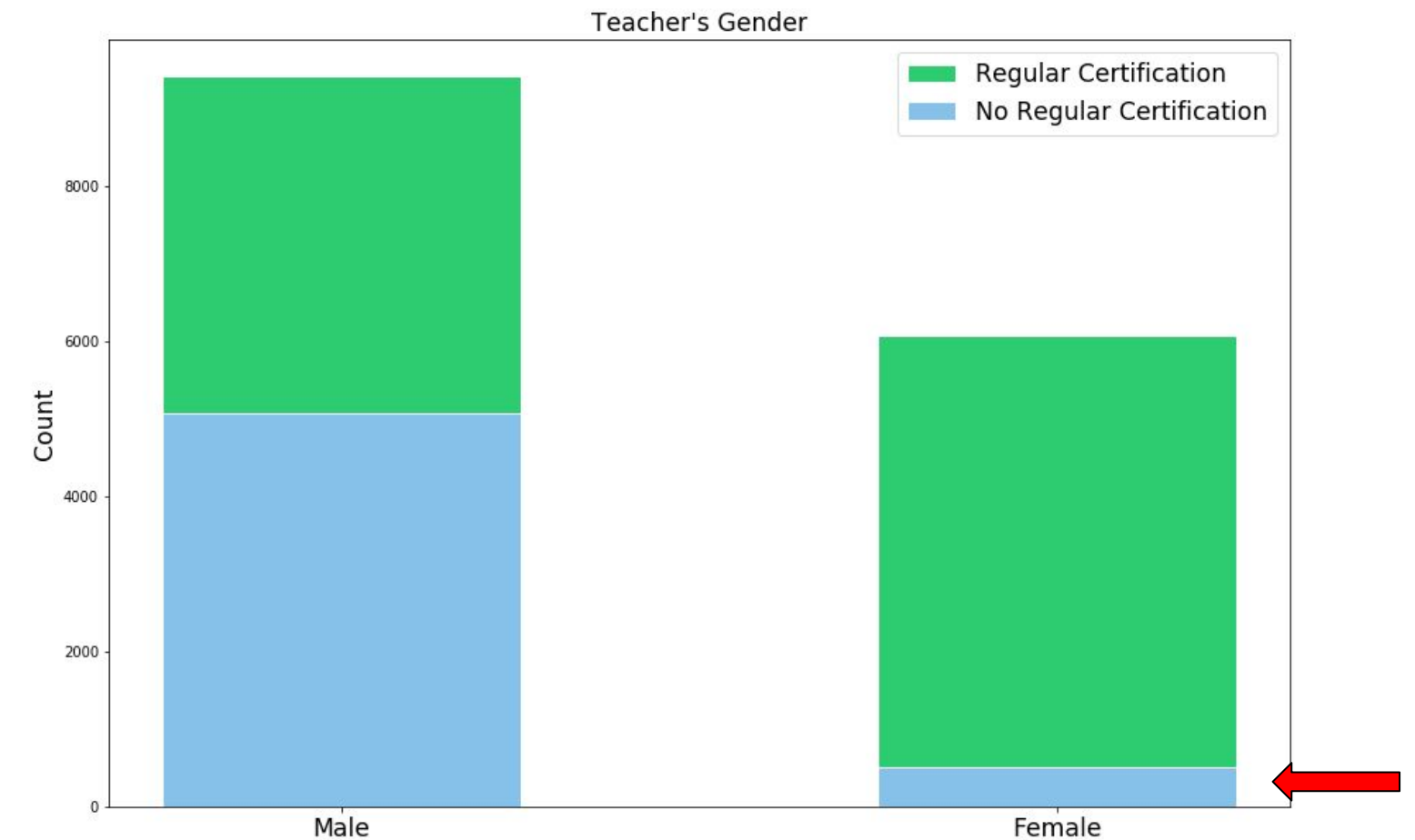
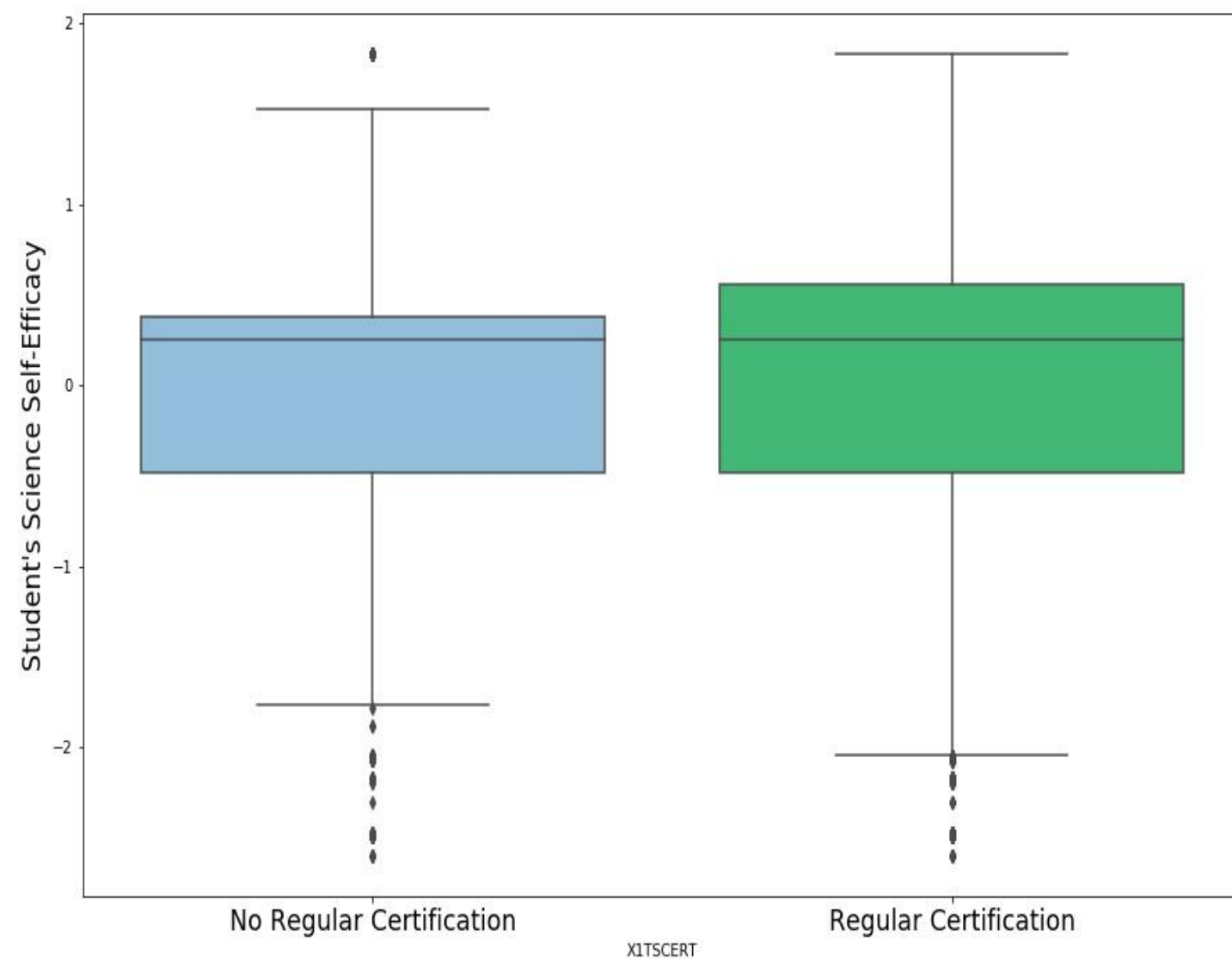


# Teacher Certification



- Teachers with regular certification are slightly better than teacher with no certification.
- Female teachers have significantly larger percentage of certified teachers than their male peers.

# Teacher Certification

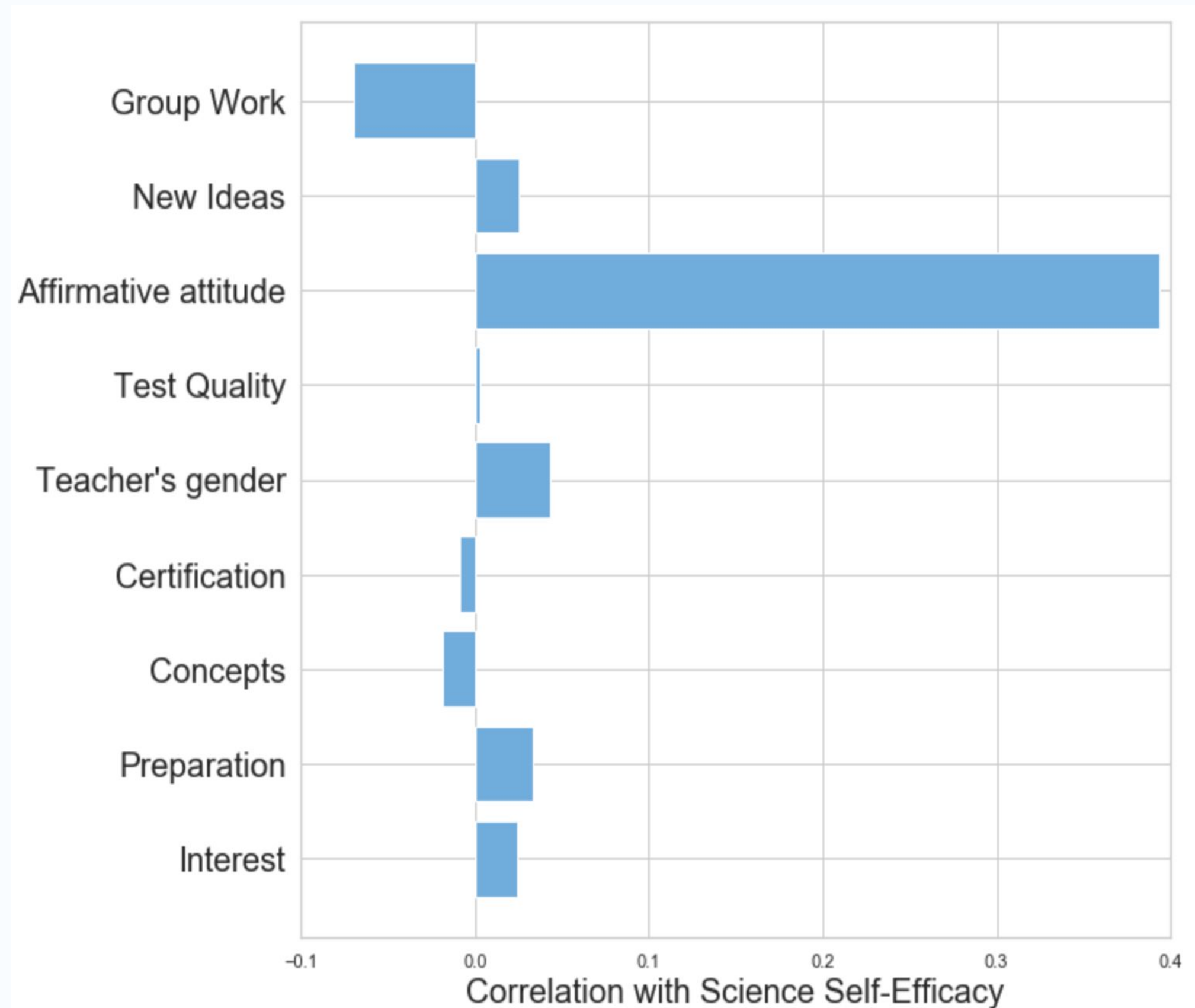


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# Teacher Attributes

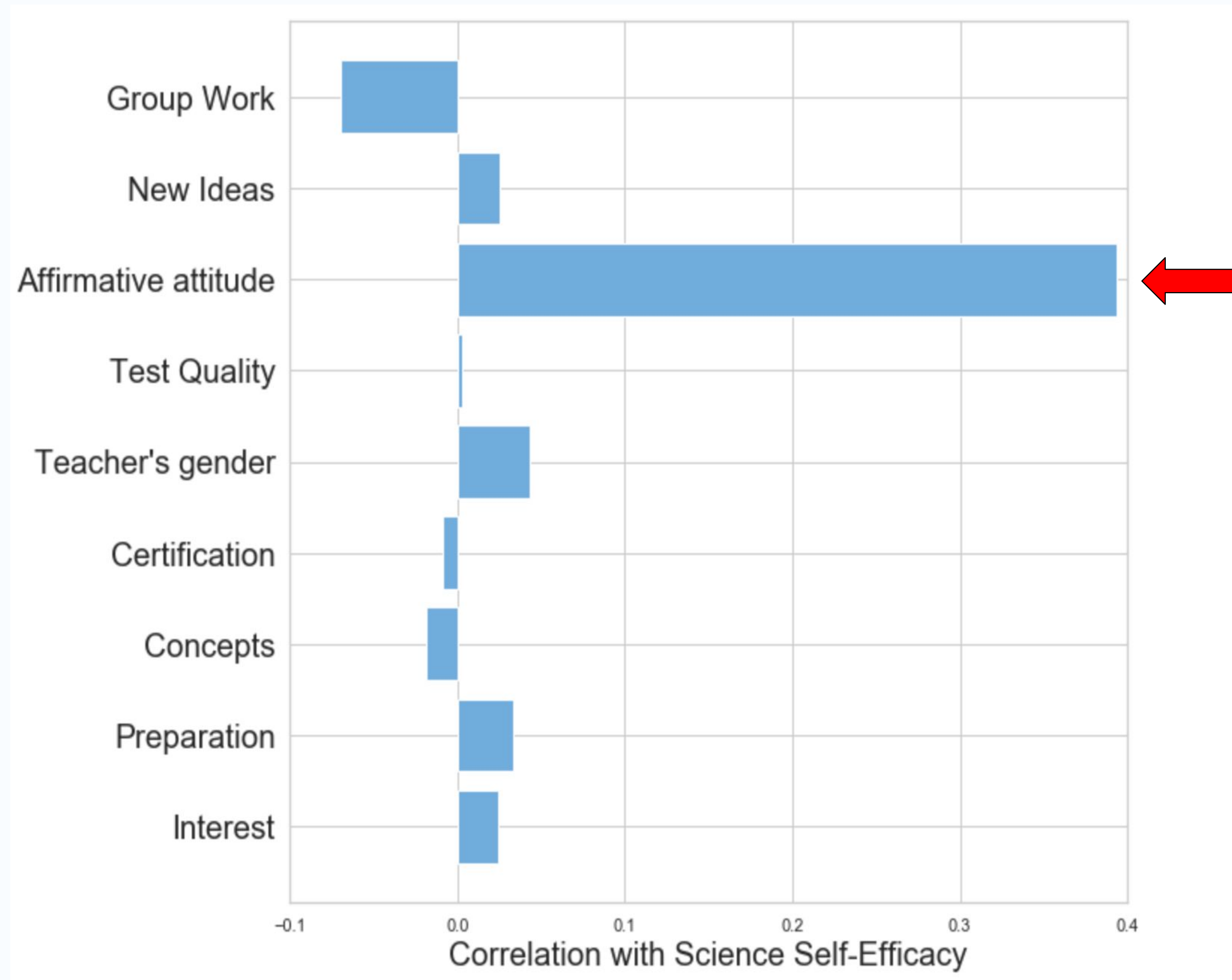
- Influence of various teacher attributes on student's science self-efficacy.
- Affirmative attitude is the clear winner.





# Teacher Attributes

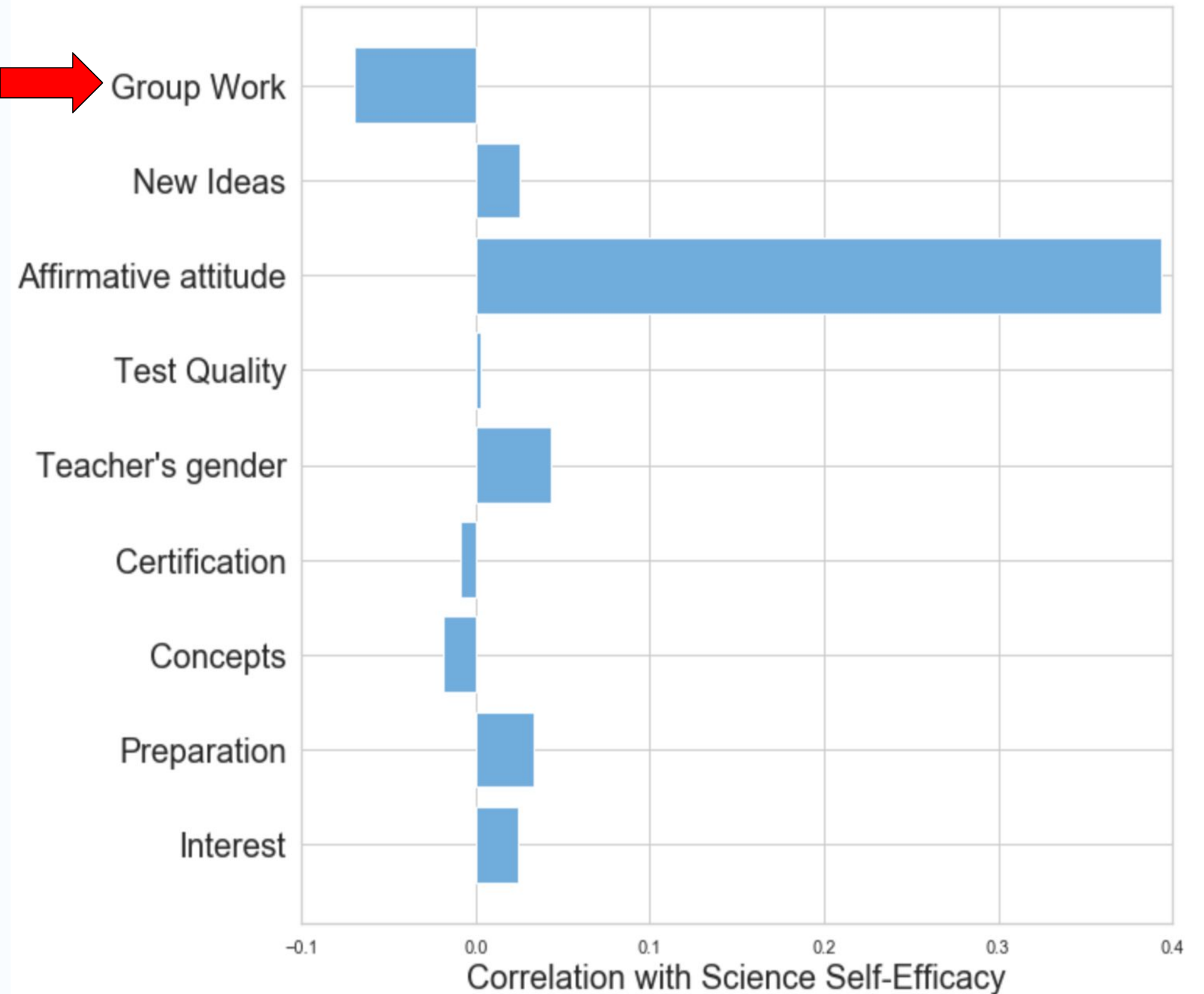
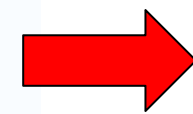
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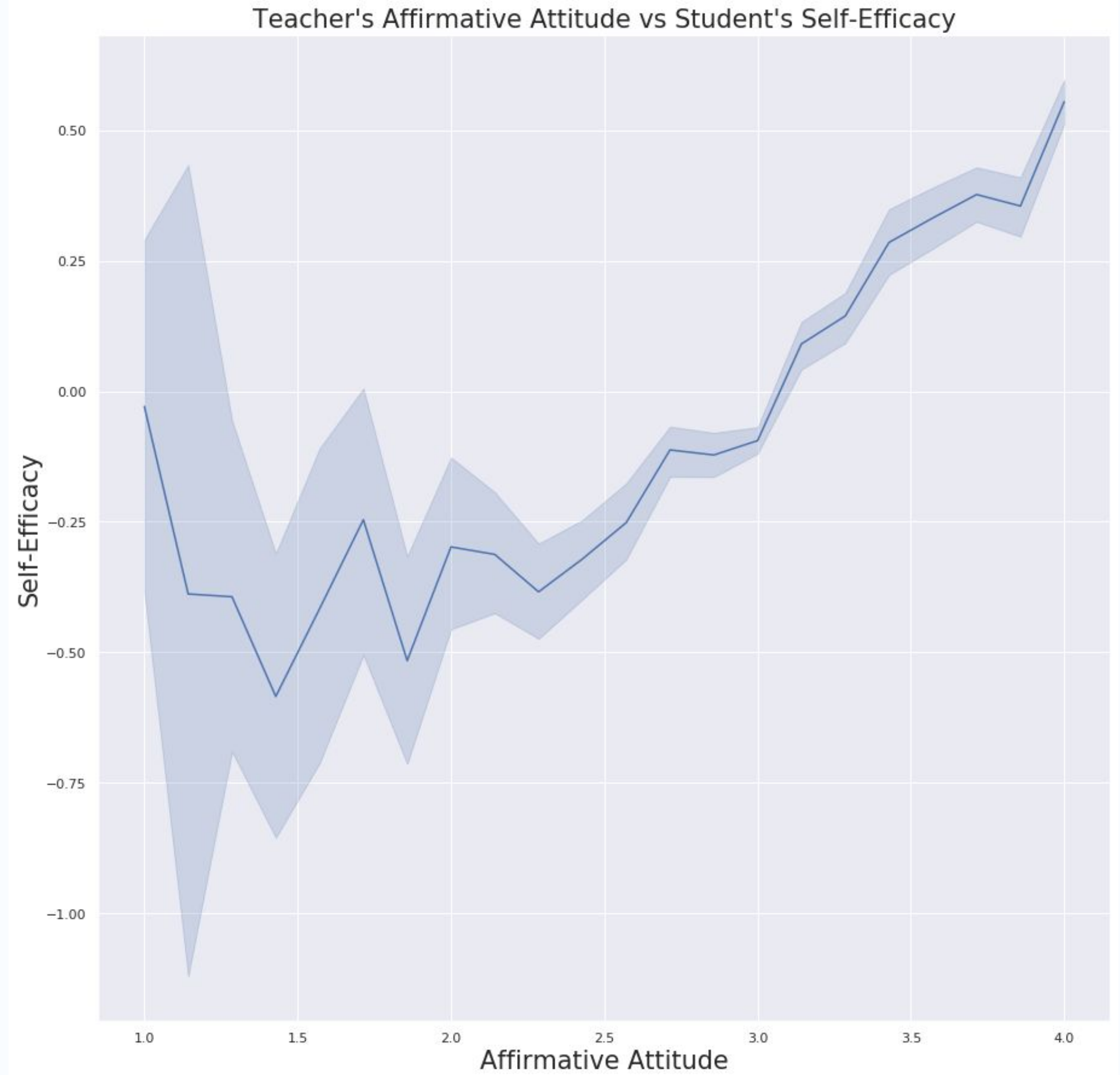
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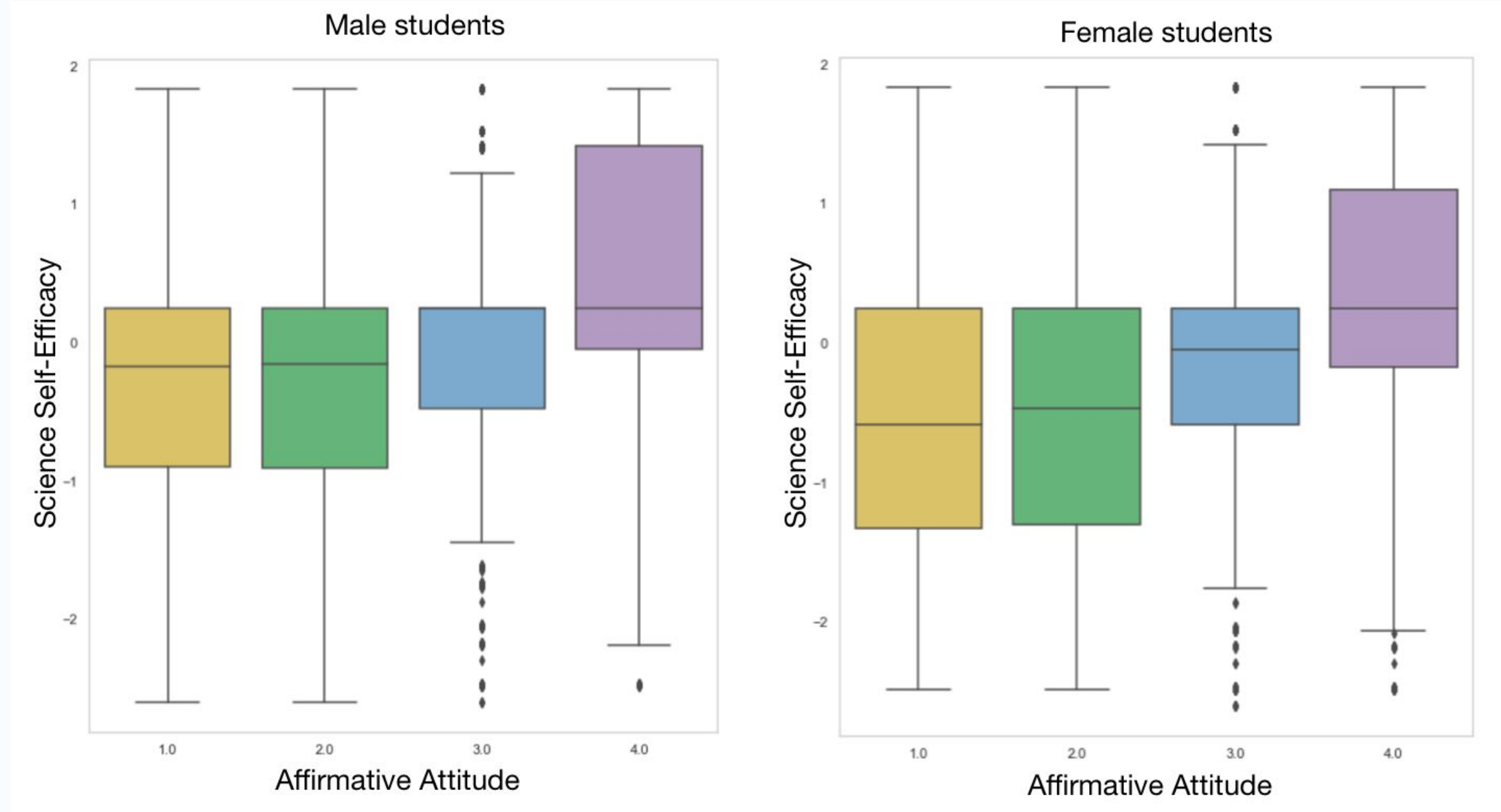
# Teachers' Attitude

- Linear positive growth of science self-efficacy with affirmative attitude.
- Greater variation in science self-efficacy for lower affirmative attitude.



# Students' influence by affirmation

- As shown earlier, science efficacy increases with affirmative attitude
- Female students show greater increase than male students, despite lower overall average science efficacy





# CONCLUSION

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## Student and School

- Gender and course choice are strong predictors
- Private schools show higher science self-efficacy than public schools
- Urban school have higher science self-efficacy than other regions

## Teacher

- Teacher certification varies for males and females, but has weak influence on the science self-efficacy.
- Students' science self-efficacy is majorly influenced by the teachers' affirmative attitude.
- Female students are more influenced by an affirmative attitude.

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# Thank You