



Increasing STEM Belonging by Broadening Children’s Perspective of Science

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INTRODUCTION

- School-aged children are susceptible to pre-existing social and racial inequalities in the perception of STEM identities, which can lower feelings of belonging in science spaces
- Subtle language cues and storytelling can shape children’s beliefs and motivations around science (Rhodes et. al., 2020; Haber et. al. 2022)
- In a museum setting, seeing a collaborative and inclusive demonstration of science increases science capital (Archer et. al., 2016)

AIMS OF THE STUDY

Here, we investigate if broadening children’s perspectives of science increases STEM identity, interest and self-efficacy. We measure if children’s self-reported STEM interest and efficacy is associated with their persistence and engagement in free-choice science-related activities.

METHODS

Validation Study: As a pilot test, we conducted informal interviews with 24 children to determine their stereotypes about which museum exhibits looked most like places where “science happens” to use in the actual study.

Study Participants: $N = 73$, 33 female, $Mage = 6.38$ years, Range = 3.77-9.68, $SD = 1.62$ were randomly assigned to a *Non-Stereotypical* condition or a *Stereotypical* condition to hear three museum stories and facts.



The Ant Farm



The Butterfly Garden

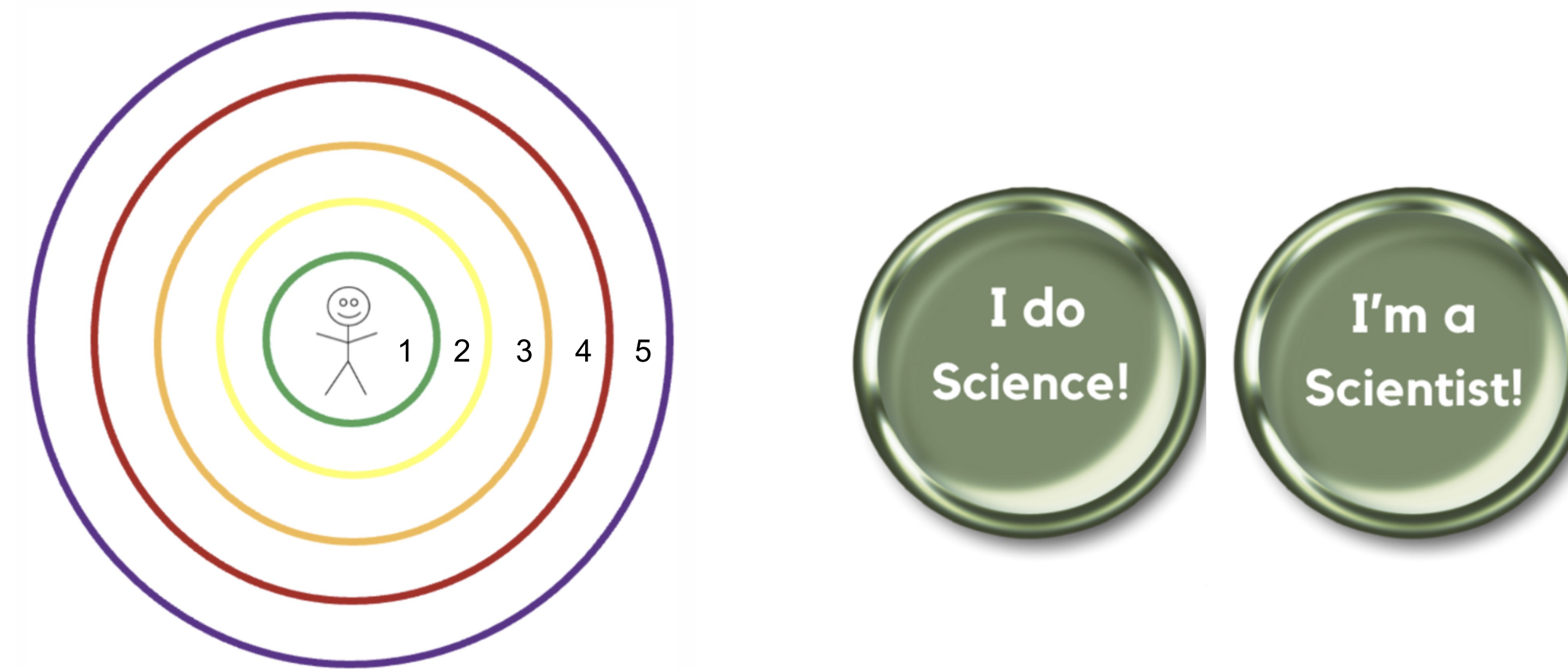
In each story:

3 science facts: e.g. “Butterflies don’t have smooth wings. They’re actually covered in tiny scales.”

3 inquiry-based questions: e.g. “What sorts of jobs do you think the ants have?”

MEASURES

Identity Measures



Psychological Distance Task

“Pretend that this person in the middle of the page is you, so circles close to you are things a lot like you and circles far from you are things not like or different than you. Where would you put a scientist?”

Button Choice

“Now, you get a button to take with you! One button says, “I do science” and one says, “I’m a scientist”. Which would you like?”

Children’s responses in the identity measures and science interest/efficacy are significantly correlated ($r(49) = .67, p < .001$).

Science Interest and Efficacy Questions

Answered using a modified Likert scale:

2 = a lot, 1 = a little bit, 0 = not that much



- How much do you want to “be a scientist”?
- How much do you want to “do science”?
- How good are you at “being a scientist”?
- How good are you at “doing science”?

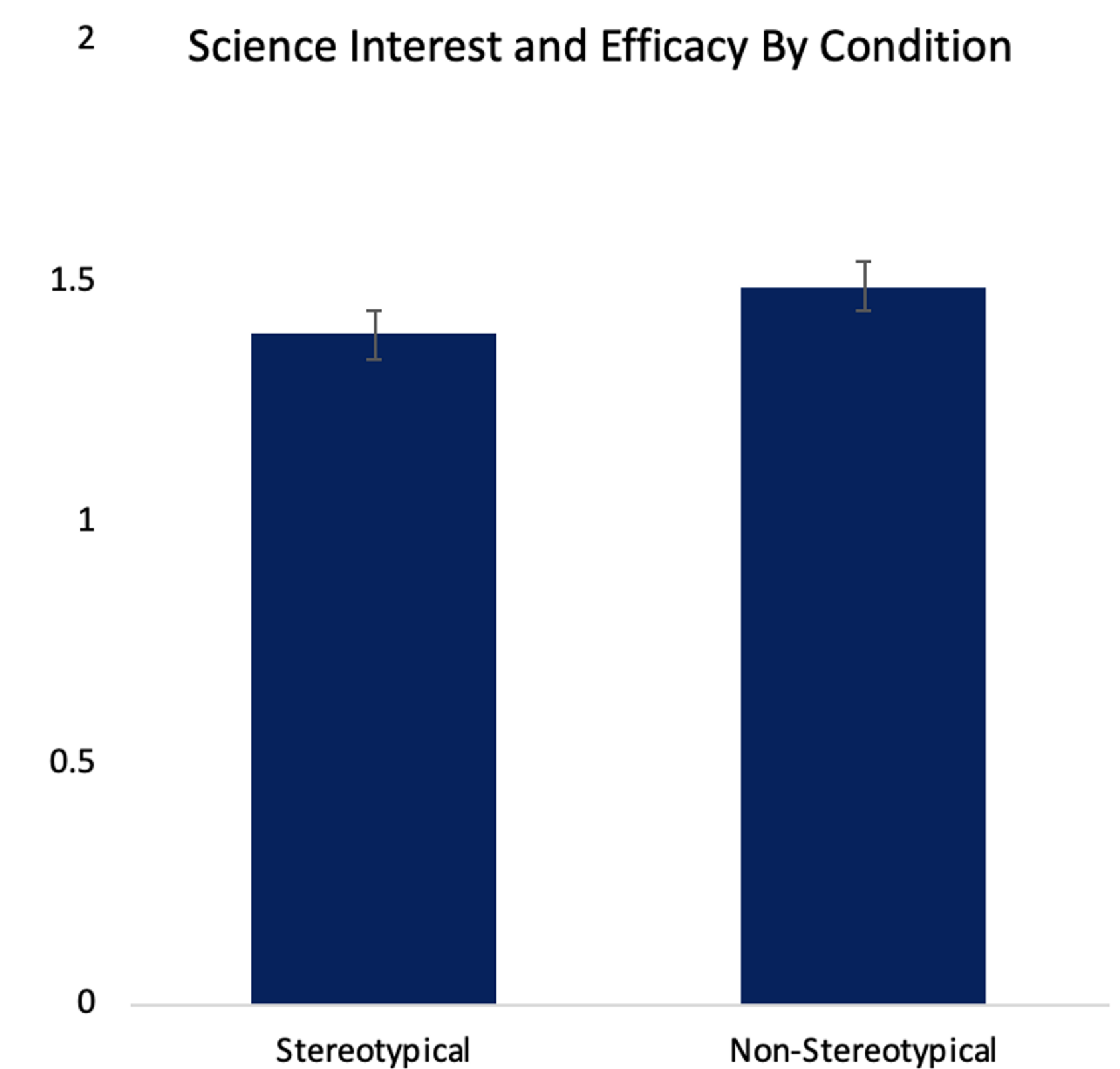
Museum Activities



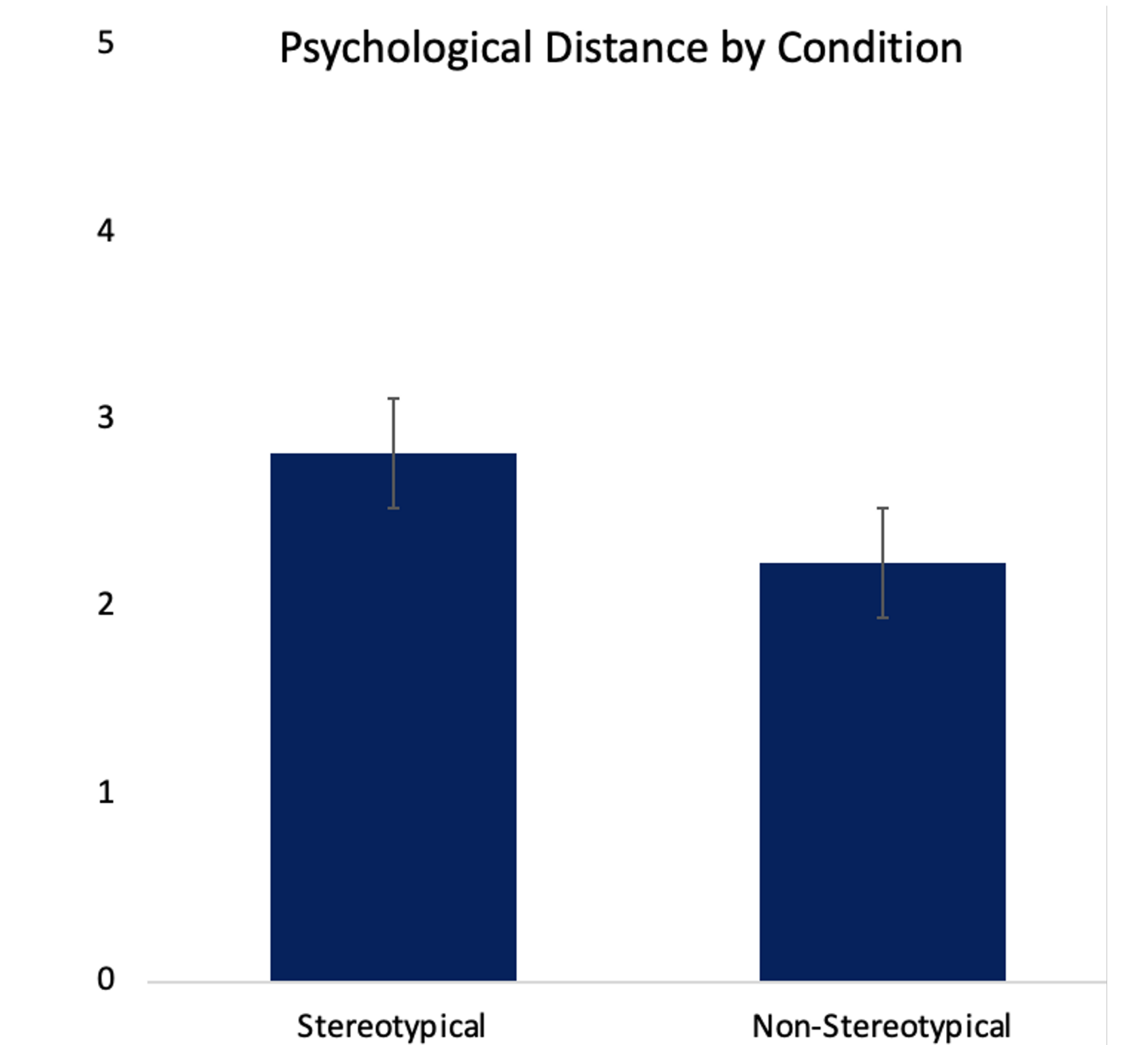
Qualitative data is still being collected and analyzed at this time.

RESULTS

Children reported feeling greater interest in science and greater science efficacy when learning about non-stereotypical examples of science than stereotypical examples (non-stereotype mean = 1.49, stereotype mean = 1.39).



Children in our study reported feeling more psychologically close to a scientist (i.e., score lower) when learning about non- stereotypical examples of science than stereotypical examples (non-stereotype mean = 2.23, stereotype mean = 2.82).



DISCUSSION AND FUTURE DIRECTIONS

- Broadening children’s perspective of what science is and where it happens increases STEM identity, interest and efficacy.
- Examine media portrayals of science and scientists that might discourage children’s STEM belonging.
- Investigate long term effects of our intervention in other settings.

ACKNOWLEDGEMENTS

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