

# Making Models Motivating: A Laboratory Intervention to Enhance Perceptions of Similarity to a Computer Scientist

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# Rethinking Role Model Similarity

*Similar* STEM role models are often used to motivate students

Limited access to demographically similar role models

Some types of similarity might not be salient to all students



Lawner et al., 2019;  
Chen & Rosenzweig (under review);  
Morgenroth et al., 2015; Ahn et al., 2019

# Purpose & Research Questions

To explore whether a novel intervention activity may be used to increase college students' perceptions of similarity to a given computer science role model

1

Can an intervention activity increase students' **perceptions of similarity** to a computer science role model?

2

Can an intervention activity increase students' **perceived competence** and **value beliefs** for computer science?

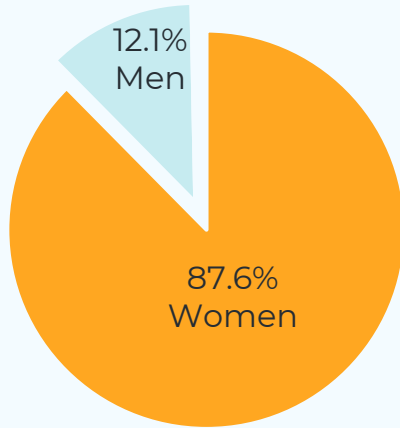
3

Are any effects of the intervention activity **moderated by student characteristics (i.e., STEM major)**?

# Participants

$N = 330$  undergraduate students from education/psychology subject pool

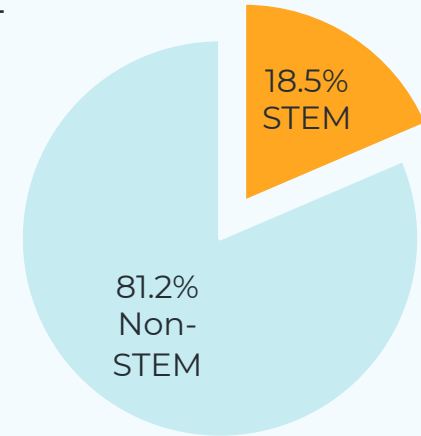
Gender



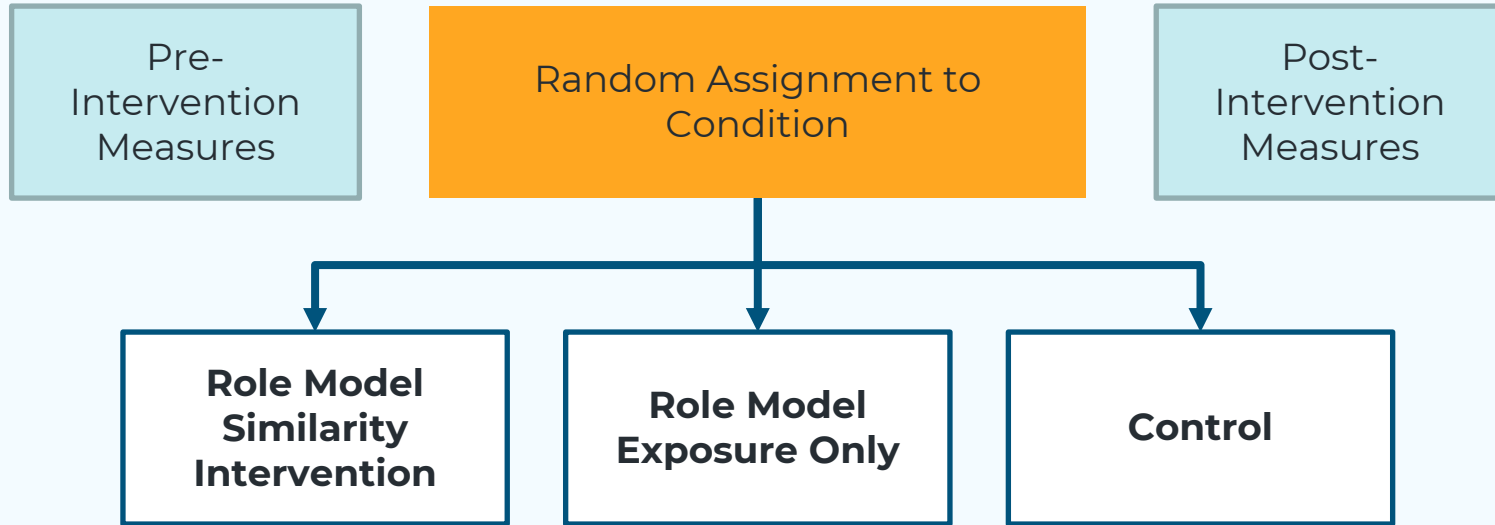
Race/Ethnicity

	<i>n</i>	%
White/European American	284	86.1
Asian or Asian American	30	9.1
Hispanic or Latino/a	18	5.5
Black/African American	15	4.5
Middle Eastern	4	1.2
Other	4	1.2

Major



# Experimental Design



**Pre-registered at:** <https://aspredicted.org/~KPKBdLLcbN>

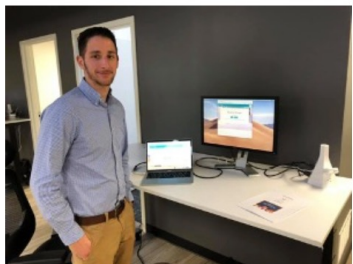
# Experimental Conditions

Condition	Role Model Similarity Intervention	Role Model Exposure Only	Control
STEM Exploration	Read descriptions about various STEM topics and career paths		
Role Model Exposure	Read a biography and narrative about a successful computer science graduate	No role model exposure	
Reflective Writing Activity	Reflect on how you and the computer science graduate are <i>similar</i> .	Summarize or discuss what you have learned	

# Role Model Exposure

Biography and narrative about a successful STEM graduate

## Biography and Photo



**James Calloway** is a mobile app developer at Mobile Roadie. He works with clients from around the world to design mobile apps for marketing platforms. From his perspective, "designing mobile apps is building the future!" James is from Marietta, Georgia and became interested in technology and science after learning about these fields in college. He attended the University of Georgia, where he graduated with a bachelor's of science degree in computer science.

## Excerpt from narrative materials

### **What do you do for a living?**

I work as an app developer for a company called "Mobile Roadie." The company has a software program that lets non-coders and non-techies make their own iPhone and Android apps. Clients vary from music labels, sports teams, events and conferences, universities and much more. I mostly work with people from different companies who use our software to create apps. The people I help range from small business owners to marketing VPs from large companies. I really enjoy it because most of the content in the U.S. today is being consumed from a mobile device, so creating apps for different businesses is important. There are even other countries that rely almost solely on mobile devices because they don't have computers. My team and I are building the future and it's really exciting.

### **What is your background?**

It wasn't like I just made a decision one day and told my parents that I wanted to be an app developer when I enrolled at UGA. I also wasn't the best student at the beginning when I first got to college. I cared a lot more about my social life than I did about my classes. I spent a lot of my time hanging out with friends instead of focusing on school. All my friends were really interested in video games and computers, so after my first semester, I explored the computer science major. During my first computer science class, I became really interested in figuring out solutions for complex problems. Even

# Measures

## Perceived Competence

MSLQ (Pintrich & de Groot, 1990; 8 items;  $\alpha = .915$ ;  $\Omega = .917$ )

*"I'm certain that I could understand the ideas taught in a **STEM/Computer Science** course."*

## Task Value Beliefs:

(Adapted from Eccles & Wigfield, 1995)

Utility value (2 items;  $\alpha = .678$ )

*"I think what I would learn in a **STEM/Computer Science** course is useful."*

Attainment value (2 items;  $\alpha = .817$ )

*"For me, I think it is important to be good at **STEM/Computer Science**."*

Intrinsic value (3 items;  $\alpha = .818$ ;  $\Omega = .825$ )

*"I find **STEM/Computer Science** to be interesting."*

Response Options: (1) Not at all true to (7) Very true



# Measures

## Perceived Competence

MSLQ (Pintrich & de Groot, 1990; 8 items;  $\alpha = .915$ ;  $\Omega = .917$ )

*"I'm certain that I could understand the ideas taught in a **STEM/Computer Science** course."*

## Perceptions of Similarity\*

\*only participants in role model conditions  
(Adapted from Cohen et al., 2017; 3 items;  $\alpha = .979$ ;  $\Omega = .980$ )

*"I feel that this person and I have many things in common."*

## Task Value Beliefs:

(Adapted from Eccles & Wigfield, 1995)

Utility value (2 items;  $\alpha = .678$ )

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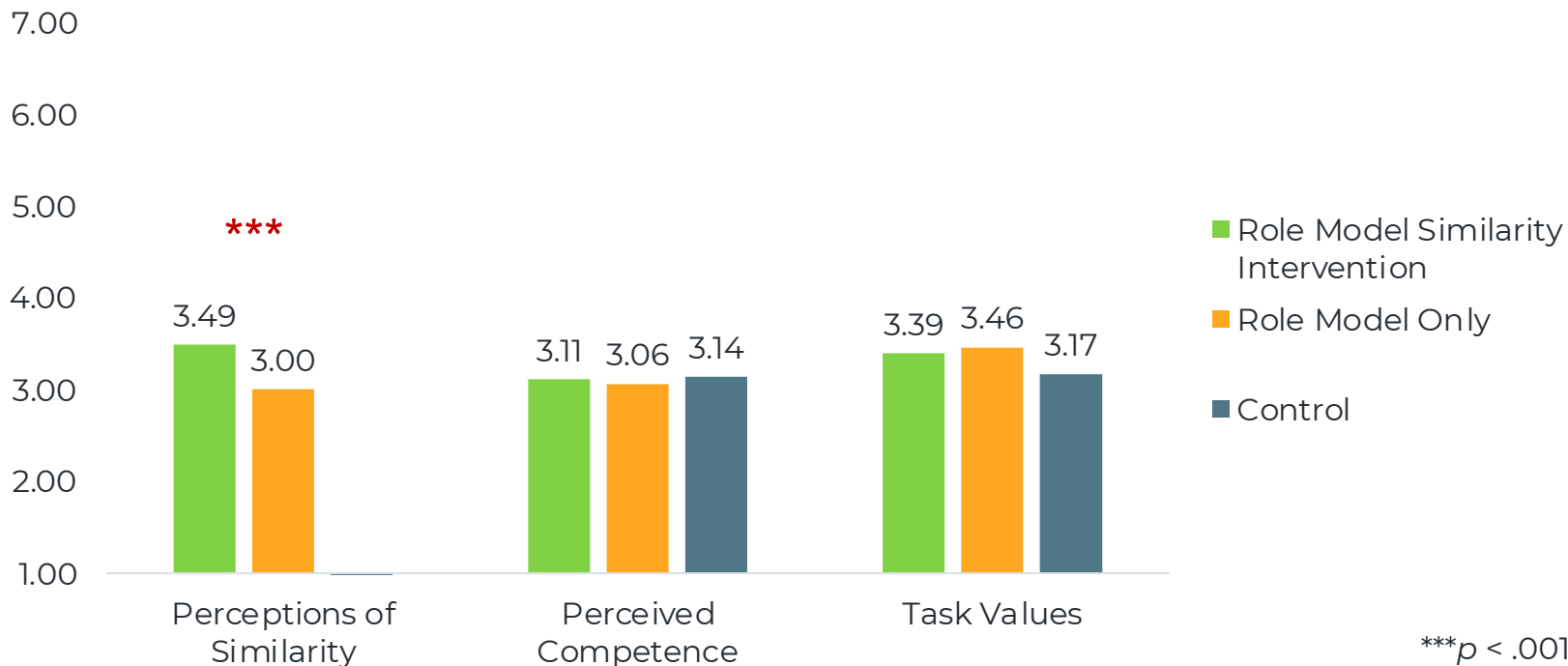
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1-2

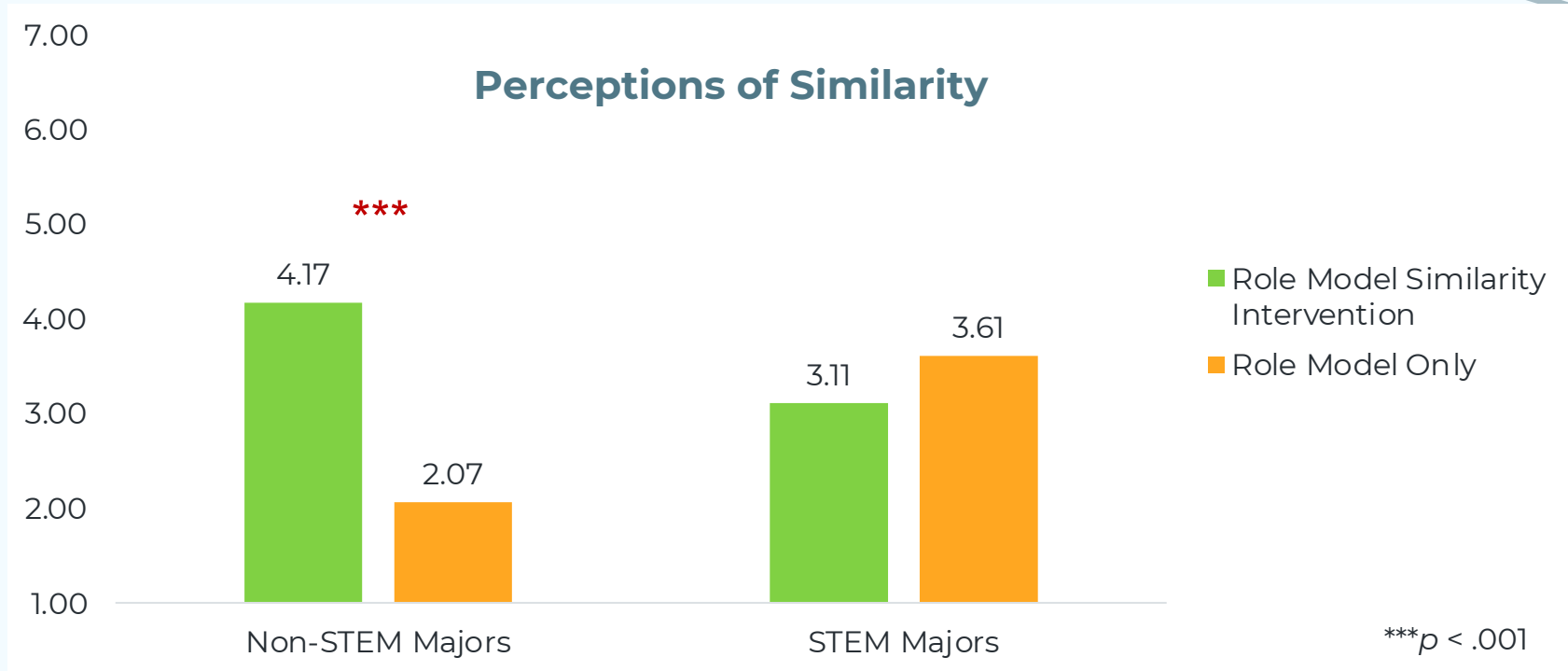
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Response Options: (1) Not at all true to (7) Very true



# Key Findings

- Researchers may be able to induce perceptions of similarity to STEM role models with self-reflective intervention activities
  - No main effects of the intervention on motivational beliefs
  - Evidence about the conditions in which similar role models can most influence STEM motivation
    - Particularly students who may be at greater risk of not identifying with STEM role models
- 

# Thanks!

Any questions?

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