CodeQueens: Increasing Identification with Computer Science among High School Girls

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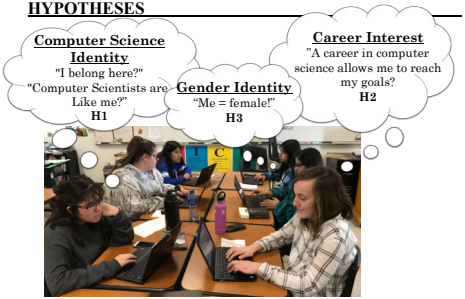
INTRODUCTION

- In the US, a computer science degree has become a gateway to many high-paying careers (Sax, 2008).
- Despite comprising 9% of the total US population, Hispanic women make up just 2% of the computer science workforce (National Science Foundation, 2017).
- Negative stereotypes about women's ability in computer science have a negative impact on underrepresented minority (URM) women's involvement in science, technology, engineering, and mathematics (STEM) (Woodcock et al., 2012).
- Individuals hold multiple identities that correspond to the different social roles they fill (eg., computer scientist, Latina) (Hogg & Ridgeway, 2003; Serpe & Stryker, 1987; Stryker & Serpe, 1982).
- Building a strong STEM-domain identity is critical, above and beyond skill development and interest, in sustaining students on a pathway to STEM (Chemers et al., 2011; Estrada et al., 2011).
- A female students' gender identity may be influenced by a shift in their computer science identity (Greenwald et al., 2002; Nosek et al., 2002).
- We designed a three-year longitudinal study using a hackathon model to assess the effectiveness of an afterschool high school coding club, called CodeQueens, on girls' interest in pursuing a computer science career.

HYPOTHESES



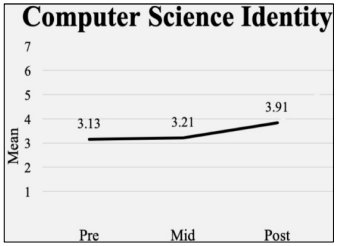
- We hypothesized that the students in the CodeQueens afterschool club would report an increase in computer science identity and interest in a computer science career

METHOD

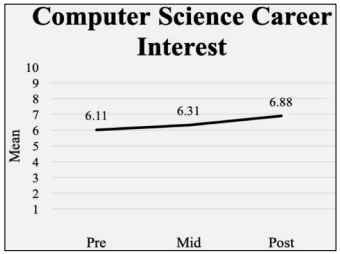
Participants & Procedure

- 248 high school girls from 8 north county high schools
- 70% Identified as Hispanic or Latina
- During the three-year longitudinal study, there were four sessions during which the girls created a game.
- Results shown are from the fall 2018 session.
- Completed an online survey 3 times each session
  - 3 questions to measure CS career interest (α = .91)
  - 1 Inclusion of other in the self (IOS) question to measure CS identity
  - 3 implicit association tests on cognitive constructs including me = computer science, me = male/female, and computer science = male/female.

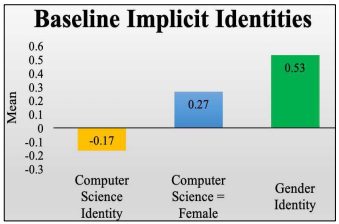
RESULTS

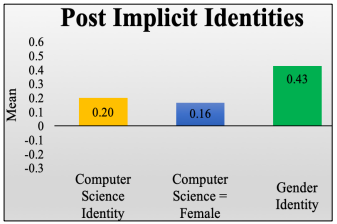


$F(2,73) = 11.25, p = .013$



$F(2,73) = 3.18, p = .05$





DISCUSSION

- We observed a robust increase in computer science identity across each of the program sessions.
- Results varied across each session, with some sessions showing an increase in computer science career interest.
- Computer science identity increased significantly moving from negative to positive, from baseline to post program, without a significant decrease in gender identity.

Part of a game a group of CodeQueens created

Schools