Do Gender Differences in Perceived Prototypical Computer Scientists Contribute to Gender Gap in Computer Science?

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Introduction

Did you know that U.S. women are underrepresented in the field of computer science? According the the study of U.S. Department of Labor in 2016, 24.7% of computer science professionals were found to be women and the rest were men.

Introduction

Men tend to have more exposure to Computer Science than women during their schooling

Women report less confidence in computer science and mathematical skills

Women feels as if they are dissimilar to the prototypical standards of Computer Science students and show less interest in the field

Women show less interest in Computer Science. Hence, underrepresentation of women in Computer Science

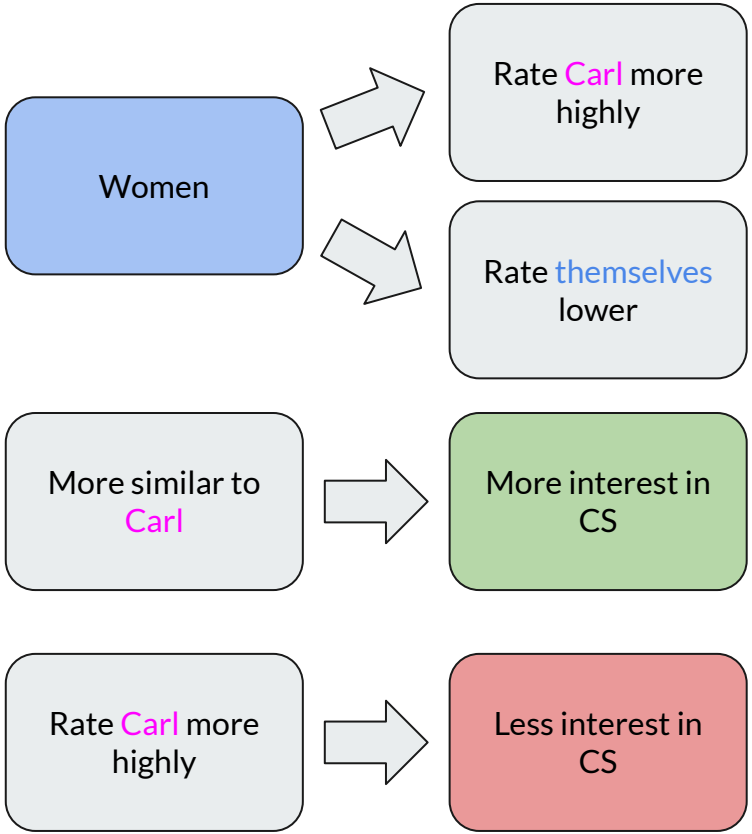
Methods

- 69 female and 27 male undergraduates from a northern US university
  - Extra credit in psychology course for survey participation
- Describe the prototypical computer scientist
  - For today's purposes: "Computer Science Carl"
- Rate your similarity to Carl
- Rate Carl on 13 traits
- Rate yourself on 13 traits
- Rate your interest in CS in the future

CARL

Methods 2: The Big Twist

- Only 3 /13 traits were considered
  - Intelligent, logical, mathematical
  - The other 10 (e.g. cynical, artistic, insecure) diffused attention away from focus
- Descriptions of Carl were too short for content analysis :(
- Predictions:
  - Women will rate themselves lower on intellect and have less interest in CS than men
  - Positive correlation between *similarity* to Carl and interest in CS
  - Negative correlation between rating Carl *higher* and interest in CS

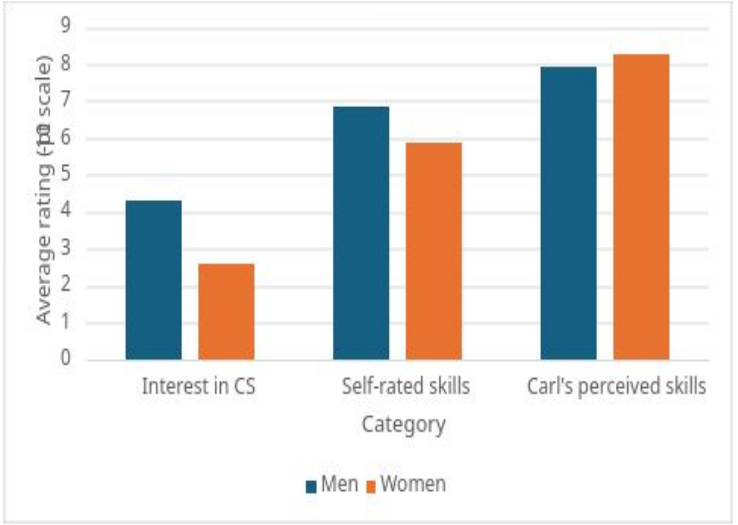


Results

Table 1 Factors for ratings of the computer science prototype and self, Study 1

	Factors rating the computer science prototype					Factors from self ratings				
Items	1	2	3	4	5	1	2	3	4	5
Athletic	.48				-.44		.65			
Artistic	.78									-.91
Creative	.82									-.91
Energetic	.77					.62	.48			
Studious	-.45						.72			
Intelligent		.52							-.42	
Logical		.83					.42	-.52		
Mathematical		.83				-.47	.47			
Introverted			.82			-.83				
Social			-.76			.81				
Cynical				.80				-.61		
Insecure				.71					.92	
Clumsy					.90			.76		
% of variance explained	25.48	12.14	10.37	8.88	7.71	21.25	16.24	11.40	8.91	8.60

Results from direct oblimin rotations performed separately on prototype and self-ratings. All loadings greater than .40 are shown



Results

Exposure to Computer Science

- Despite similar levels of exposure to CS for both male and female, self reported exposure did not mediate the relationship between gender and perceptions of the CS prototype

Limitations & next steps

- Reliance on self-reporting
  - e.g. Gender difference in survey response patterns
  - NOTE: not *necessarily* a bad thing

Participant selection: university students, taking psychology
  - e.g. how would self-perception (and Carl-perception) differ among women enrolled in CS courses/programs?

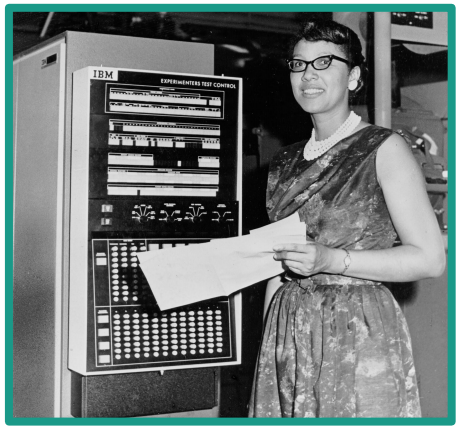
- Why do men and women perceive Carl differently?
- Why does perceiving Carl differently lead to reduced interest in CS?
  - One hypothesis: “pluralistic ignorance”
- Does feeling different from Carl also impact feelings of belonging within CS programs and workforces?

Pluralistic ignorance

- Students believe they are alone in their struggles, leading them to feel that their difficulty in Computer Science is linked to intellectual capability
- Impact on Women: view male as more suited to the Computer Science prototype creating feelings of inadequacy, a sense of alienation and low confidence

Suggestions:

- Increase exposure to positive role models to increase interest in STEM
- Direct experience with counterstereotypic exemplars in the fields



Thank you for Listening!