Gender stereotypes and the career choice process: Implications for graduate education in computer science

Overview

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How do gender stereotypes about technical capabilities influence the decisions of men and women to enter into computer science and to persist on this path into graduate study and beyond? Answers to this question are important because they suggest strategies for improving the recruitment and, especially, the retention of graduate students in computer science.

To provide some answers to this question, I will describe a general social psychological model about how gender stereotypes shape emerging career aspirations that I developed and evaluated in some of my previous work (Correll 2001; 2004) While the model is abstract and general, computer science is a discipline to which the model is highly applicable, since gender stereotypes about computing skills and interests abound. These “male-advantaging” stereotypes include beliefs that men are naturally more skilled at or interested in technical domains that are believed to be necessary to be successful in computer science. While we have ample reason to doubt the truth-value of these beliefs, the beliefs themselves can powerfully and differentially shape the decisions of men and women to persist on the path towards a graduate degree in computer science and beyond.

The social psychological model presented today assumes that while there are all kinds of reasons why an individual might prefer one career over another, as a minimum, she must believe that she has the skills necessary for a given career in order to persist on a path leading to that career. I refer to a person’s own understanding of his or her competence as a “self-assessment.” The model explains how gender stereotypes beliefs bias the formation of self-assessments and, consequently, emerging career-relevant aspirations. I present empirical evidence supporting two main paths by which gender stereotypes influence self-assessments of task ability. First, gender stereotypes can actually undermine task performance. If you perform less well on a test that is diagnostic of some ability, you will likely come to see your self as having less of that ability. Second, gender beliefs can influence the standard that we use to evaluate our task performance. If we judge our task performance using a harsher performance standard, we will be less likely to see ourselves as having task ability than if we had instead used a more lenient standard. The implication is that, if left unchecked, gender stereotypes will contribute to the under-representation of women in computer science. I end with a discussion of how organizations might intervene in these processes, thereby creating a more positive climate.
Gender Stereotypes & the Career Choice Process: Implications for Graduate Education in Computer Science

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While there are many reasons why individuals might prefer one career to another...

...as a minimum, individuals must believe they have the skills necessary for a given career in order to develop preferences for that career.

Stereotypic beliefs about men/women → Individual assessments of competence

But how? Stereotypes impact...
- Task performance
- The standard we use to evaluate performance information

Individual assessments of competence → Aspirations & career-relevant decisions

True Ability
Performance

Self Assessment of Ability

A* | P1 | P2

LOW → HIGH
How do stereotypes impact performance?

• "Stereotype threat"
• Interferes with working memory capacity
• Situational—when beliefs that are salient change, so do performance outcomes

Stereotype threat summary

Negative stereotype about one’s own group, when salient, leads to lower performance, controlling for actual ability level.

How do stereotypes impact self-assessments?

• Stereotypes also impact the standard we use to decide whether our performance indicates that we have sufficient ability.
• Central idea is that when you know that others do not expect “people like you” to be good at a given type of task, you judge your own performance by a harsher standard.

Correll, 2004 (American Sociological Review)

• 80 undergraduates—40 males, 40 females
• Dependent variables
  - Ability standard
  - Self-assessment of task competence
  - Future aspirations
• Key independent variable
  - Gender belief associated with task
• Bogus task (test of “contrast sensitivity” ability)
• Performance feedback held experimentally constant

<table>
<thead>
<tr>
<th>Correll, 2004 (American Sociological Review)</th>
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<tbody>
<tr>
<td><strong>Ability Standard</strong></td>
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<tr>
<td>When participants heard...</td>
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<tr>
<td>Men have more task ability</td>
</tr>
<tr>
<td>79.3%</td>
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<tr>
<td>Women</td>
</tr>
<tr>
<td>88.9%</td>
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<tr>
<td>There is no gender difference in task ability</td>
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<tr>
<td>83.1%</td>
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<td>82.4%</td>
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How do stereotypes impact self-assessments?

If you judge your performance with a harsher standard, you will make lower assessments of your own task ability.

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Self-assessments & emerging aspirations (Correll, 2004)

- Male participants reported significantly higher aspirations for paths requiring ability on the experimental task in conditions where they had heard that men have more task ability.
- No gender differences in aspirations were found in conditions where participants heard that gender was unrelated to task ability.
- Situational—when beliefs in setting change, so do ability standards, self-assessments, and aspirations.

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Why a laboratory experiment? Why a bogus task?

Rules out competing "supply-side" explanations that ...  
- Women simply have less task ability  
- Women "naturally" are less interested

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Avoiding “blaming the victim” explanations

- Not just a "pc thing"  
- BTV models are incorrect  
- Suggest no avenues for change

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An application to the “path to math” (Correll 2001, American Journal of Sociology)

- Mathematics stereotyped as masculine domain.  
- Consistent with previous study, male students were found to assess their mathematical ability higher than their equal ability female counterparts did.  
- Situational—female students were found to assess their verbal ability higher than their equal ability male counterparts.
An application to the “path to math” (Correll 2001)

Higher self-assessments of mathematical ability...
- increased the odds that students enrolled in high school Calculus
- chose a college major in science, math or engineering

Implications...

If left unchecked, gender stereotypes will contribute to the under-representation of women in technical fields.

What can be done?
Underlying principles to keep in mind
- Stereotypic biases often occur out of consciousness
- Biases are more extreme in uncertain settings
- The impact of stereotypes change when beliefs in the local setting change

What can be done?
What doesn’t work?
- Must change gender beliefs about gender and task competence that exist in an organization, not just individual women’s beliefs (i.e., avoid “fixing women” approaches).
- Biasing effect of stereotypes has demand-side counterpart.

What can be done?
Organizations need to...
- Control the message: What are the gender beliefs that are operating in the organization?
- Make performance standards clearer and communicate them clearly.
- Hold gatekeepers accountable for gender disparities.