



Research Workshop Team J:  
**Why Do They Come – Why Do They Stay?:  
Career Motivations among Technical  
Undergraduate Students**

OurCS Conference  
Pittsburgh PA  
October 20, 2013

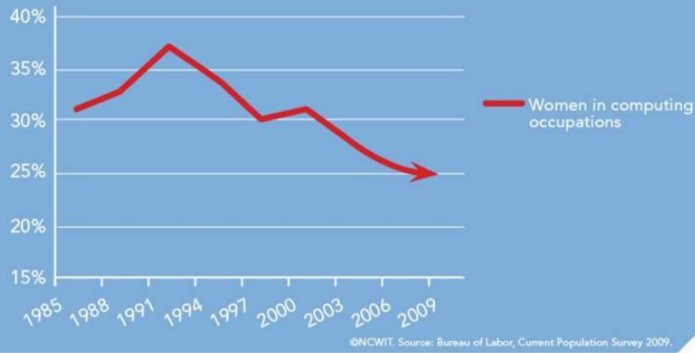
# Research Team Members and Group Leaders

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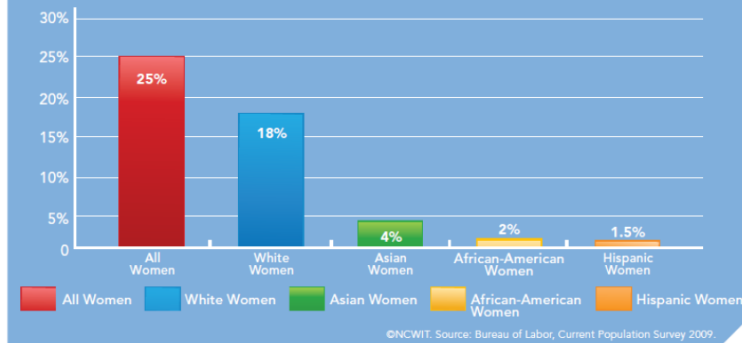


# Motivation

The percentage of computing occupations held by women has been declining since 1991



Percentage of computing occupations held by women, 2009<sup>15</sup>



*“If the current trends continue in 2018 the information technology industry will only be able to fill half of its available jobs.”*

Source: NCWIT, 2009  
[http://www.ncwit.org/pdf/NCWIT\\_](http://www.ncwit.org/pdf/NCWIT_)

Background

Research Process

Findings

Conclusion

## Project Overview

Despite the shortage of information technology (IT) professionals in today's global market, student enrollment in technical undergraduate degrees is on the decline. In an attempt to address the industry gap between supply and demand, it is important to understand the values and motivations of current undergraduates studying in the IT-domain.

***Hence, the purpose of this project was to examine the reasons why undergraduate students select and remain in a technical area of study. Our specific area of focus was centered on women studying CS at CMU.***

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# Research Question

Why do students in the United States pursue undergraduate careers in CS/IT – related fields?

Background

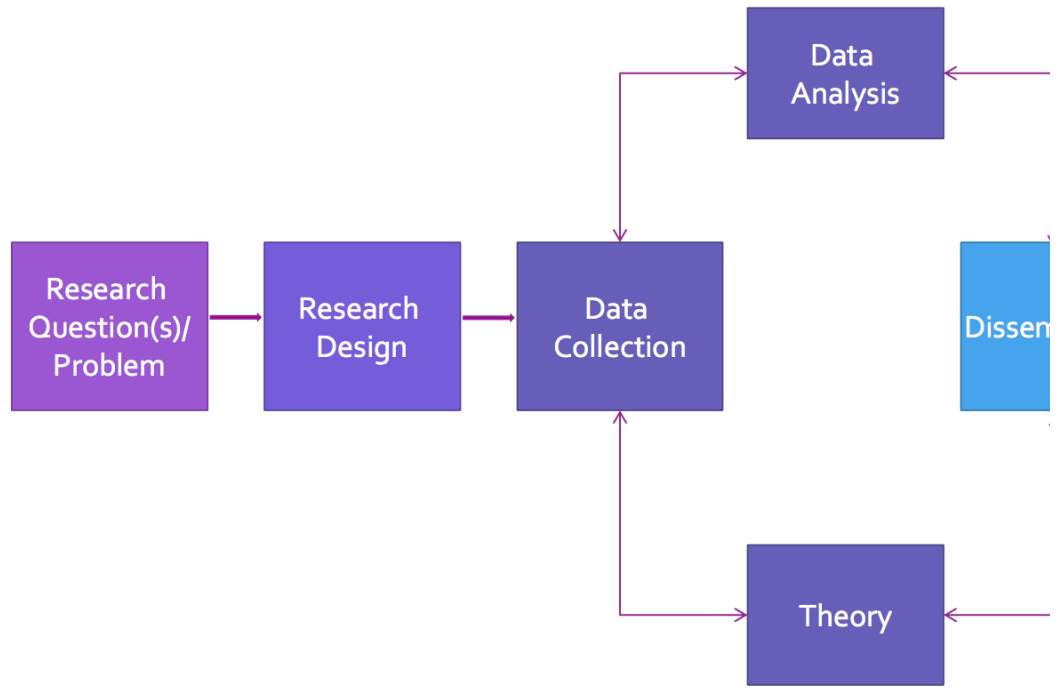
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*Our goal is to understand the story behind the statistics*

# Interpretive Research Process



# Research Design

## Conceptual Framework

### ❖ Individual Characteristics

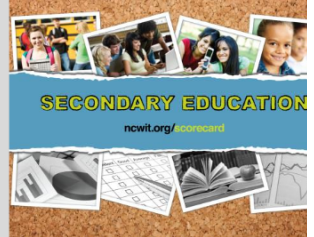
- Ability in math/science
- Tinkering/curiosity

### ❖ Educational Influences

- K – 12 science/math focused curriculum
- AP opportunities

### ❖ Societal/Cultural Influences

- Parental expectations
- Gender roles
- Hometown
- Parental encouragement



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Research Process

Findings

Conclusion

# Data Collection



- Interview data (Fall 2011)
- 40 Sophomore undergraduate CS majors (CMU)
  - 20 males
  - 20 females
- Participants chosen at random
- Interviews conducted by Carc Frieze as an ongoing case study at CMU

Background

Research Process

Findings

Conclusion



# Data Analysis

## *Interview Questions Examined*

- 4.** When and how did you first get interested in computers and computing?
- 6.** Who would you say is the most influential person in your decision to major in computer science?
- 10.** Can you describe for me the characteristics of computer science students here at Carnegie Mellon?
- 13.** Do you think computer science stereotypes still prevail generally?
- 16.** Before coming here, did you have any programming experience?
- 17.** Do you like or dislike programming?
- 18a.** What would you say – what are the skills that you need to be a good programmer?
- 18b.** Do you feel you have these skills?

Background

Research Process

Findings

Conclusion

## Data Analysis

### *Interview Questions Examined*

- 19. How would you define computer science?
- 23. Do you feel you've been successful in the program so far?
- 28a. *(here add grades for each* What have your grades been like?
- 28b. What is your overall GPA?)
- 45. Have you experienced any problems in the program because you're a woman/man?
- 53. Overall, do you feel like you fit in computer science academically?
- 54. Overall, do you feel like you fit in computer science socially?

Background

Research Process

Findings

Conclusion

# Findings

# Coming to Computer Science

Background

Research Process

Findings

Conclusion

- Importance of early exposure



Background

Research Process

Findings

Conclusion

# Work-life balance/mothe rhood



Background

Research Process

Findings

Conclusion

# Stereotypes of the Field



Background

Research Process

Findings

Conclusion

# Performance vs. Perception

- Confidence levels

Background

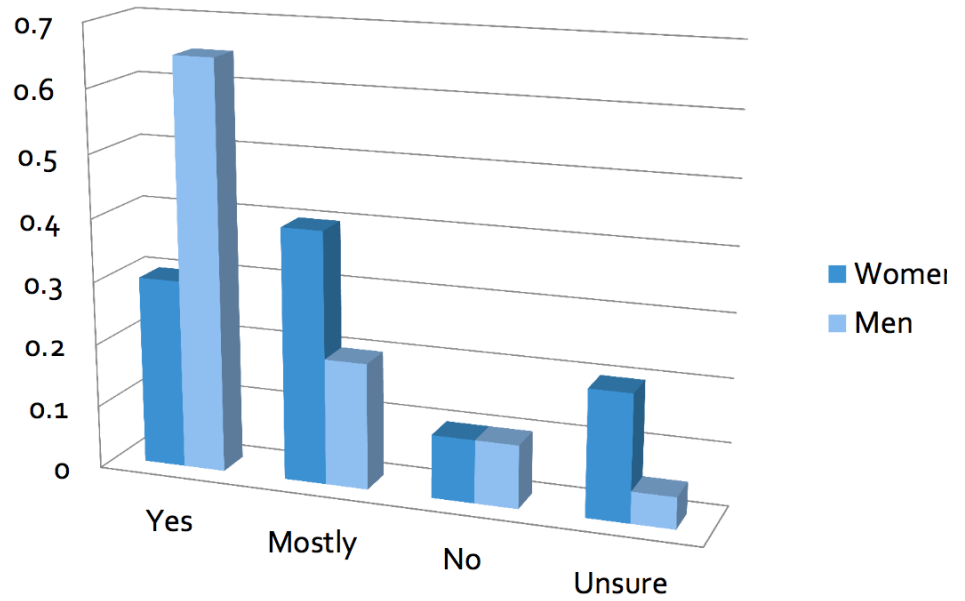
Research Process

Findings

Conclusion

# Perception of Success

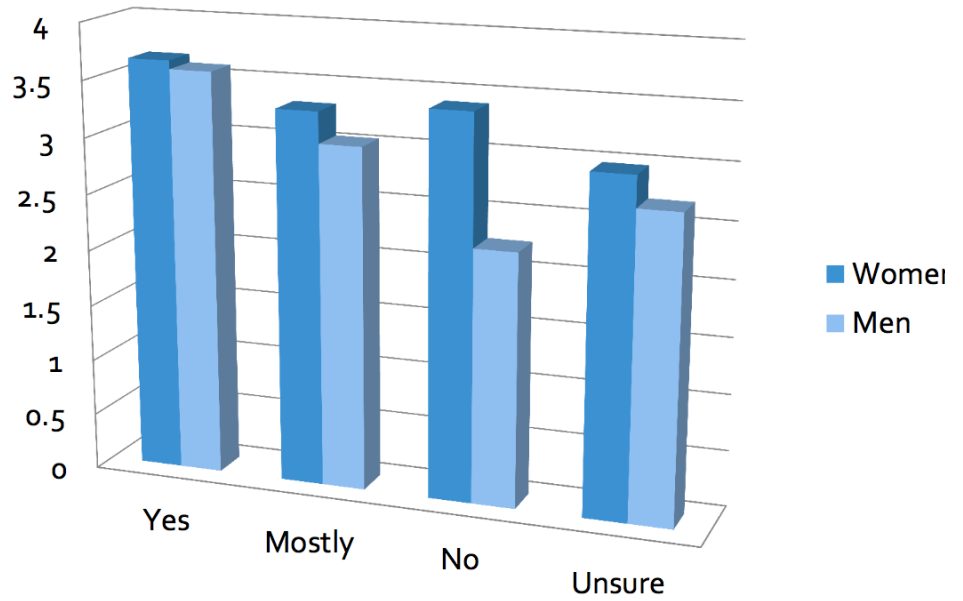
### Perception of Success





# Performance

### Performance (QPA)



## Conclusion

- Take away:
  - Work-life balance and motherhood
  - Exposure to varying opinions different backgrounds
  - Narrow field research sample
- Recommendations
  - Other university perceptions
  - Expanded network of female professionals
    - Mentorship and role models

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Findings

Conclusion