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An Examination of How Women and Underrepresented Racial/ Ethnic Minorities Experience Barriers in Biomedical Research and Medical Programs

Devasmita Chakraverty
University of Nebraska-Lincoln, dchakraverty2@unl.edu

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Abstract for DBER Group Discussion on 2013-10-10

Presenter(s), Department(s):
Devasmita Chakraverty
Postdoctoral Research Associate
Department of Chemistry
University of Nebraska-Lincoln

Title:
An Examination of How Women and Underrepresented Racial/Ethnic Minorities Experience Barriers in Biomedical Research and Medical Programs

Abstract

Women in medicine and biomedical research often face challenges to their retention, promotion, and advancement to leadership positions (McPhillips et al., 2007); they take longer to advance their careers, tend to serve at less research-intensive institutions and have shorter tenures compared to their male colleagues (White, McDade, Yamagata, & Morahan, 2012). Additionally, Blacks and Hispanics are the two largest minority groups that are vastly underrepresented in medicine and biomedical research in the United States (AAMC, 2012; NSF, 2011). The purpose of this study is to examine specific barriers reported by students and post-degree professionals in the field through the following questions:

1. How do women who are either currently enrolled or graduated from biomedical research or medical programs define and make meaning of gender-roles as academic barriers?
2. How do underrepresented groups in medical schools and biomedical research institutions define and make meaning of the academic barriers they face and the challenges these barriers pose to their success in the program?

These questions were qualitatively analyzed using 146 interviews from Project TrEMUR applying grounded theory. Reported gender-role barriers were explained using the "Condition-Process-Outcome" theoretical framework. About one-third of the females (across all three programs; majority White or Black between 25-35 years of age) reported gender-role barriers, mostly due to poor mentoring, time constraints, set expectations and institutional barriers. Certain barriers act as conditions, causing gender-role issues, and gender-role issues influence certain barriers that act as outcomes. Strategies to overcome barriers included interventions mostly at the institutional level (mentor support, proper specialty selection, selecting academia over medicine).

Barrier analysis for the two largest URM groups indicated that, while Blacks most frequently reported racism, gender barriers, mentoring, and personal barriers, Hispanics most frequently reported economic barriers, language barriers, institutional and workplace environment barriers, and gender-role barriers. Examining barriers using the "Individual-Institutional" theoretical framework indicated that barriers do not occur in isolation, but due to an interaction between the individual and its institution. Additionally, the barriers of the two groups are qualitatively different and the "one size fits all" approach may not be suitable for interventions.

Barriers in Bio-medicine: Experiences of Women and Underrepresented Racial/Ethnic Minorities

Supported by a grant from the National Institutes of Health (NIH-NIGMS 1 R01 GM094535-01)

Devasmita Chakraverty, Ph.D.
October 10, 2013

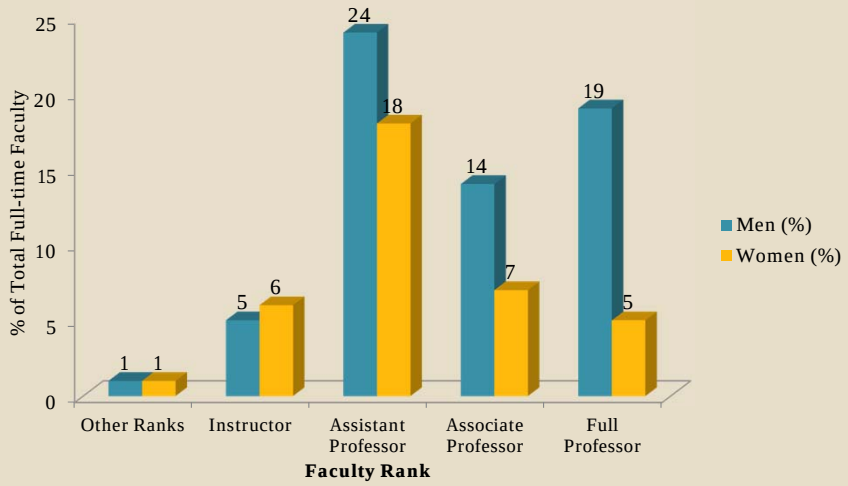
Professional Biography

2

- Post Doctoral Research Associate (Chemistry Department) with Professor Marilyne Stains.
- Education:
  - Ph.D. (Science Education)- University of Virginia.
  - M.P.H. (Toxicology)- University of Washington.
  - M.Sc. (Environmental Sciences)- University of Calcutta.
  - B.Sc. (Zoology)- University of Calcutta.

U.S. Medical School Full-time Faculty Distribution by Rank and Gender, 2012 (Reproduced from AAMC, 2012).

3



(AAMC, 2012; NSF, 2011)

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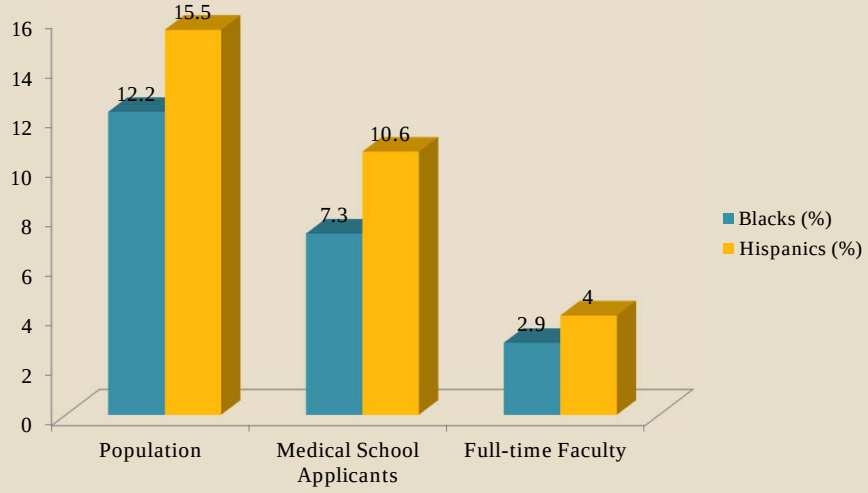

Definition of Terms

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- Minority
  - A racial/ethnic group that is a small percentage of the U.S. population
- Underrepresented Minority
  - 1 of 3 racial or ethnic groups (Blacks, Hispanics, American Indians) whose representation in the scientific workforce is smaller compared to their representation in the U.S. population
- Doctor of Medicine (MD)
- Doctor of Philosophy (PhD)
- MD/PhD

What is Currently Known?

6

- Gender and race are the key to diversity.
- Women: Recruitment is not an issue. Advancement, promotion, and retention is an issue.
- Blacks and Hispanics are enveloped as a single group; comparative analyses are sparse.
- Some URM barriers may not be racial (debt), but they impact URMs more severely.

What is Less Known?

7

- Sparse barriers research for PhD or MD/PhD students (The focus is on MD programs).
- No comparative analyses for race/ethnicity.
- Seldom incorporate experiences of both students and faculty.
- Strategies to overcome barriers?

Research Questions

8

1. How do women students and graduates in bio-medicine describe gender roles as professional barriers?
2. How do Blacks and Hispanics in bio-medicine describe the academic barriers they face and the challenges these barriers pose to their success in the program?

Barriers

9

- Gender barriers
  - Study sample: 118 Women
  - Gender-roles (childbearing and childrearing)
- Racial/Ethnic barriers
  - Study sample: Blacks (18 male, 38 female) and Hispanics (10 male, 16 female)
  - Comparison of reported barriers

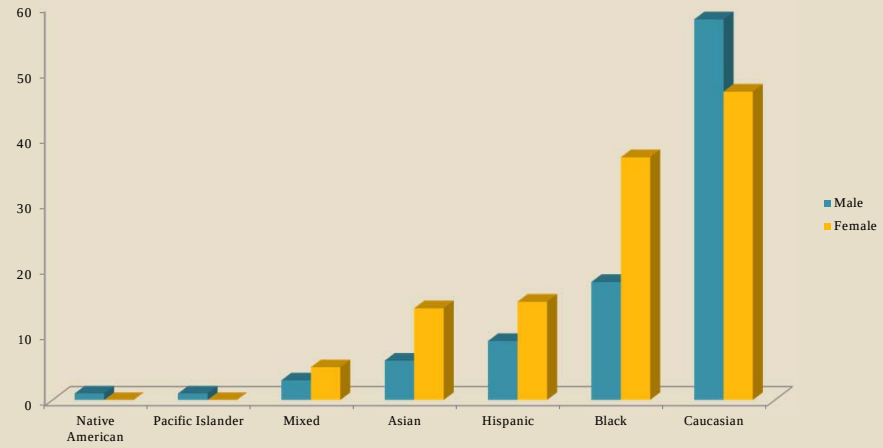
Transitions in the Education of Minorities Underrepresented in Research (TrEMUR)

10

- Qualitative-Grounded Theory (Charmaz, 1983): 214 interviews.
  - Students, former students, graduates, scientists, non-scientists, and faculty.
  - Medical program and biomedical research (MD, PhD, or MD/PhD).
- Purposeful and snowball sampling

Racial and Ethnic Distribution of the Overall Sample (N=214)

11



Sample for Research Question 1 (n=118)

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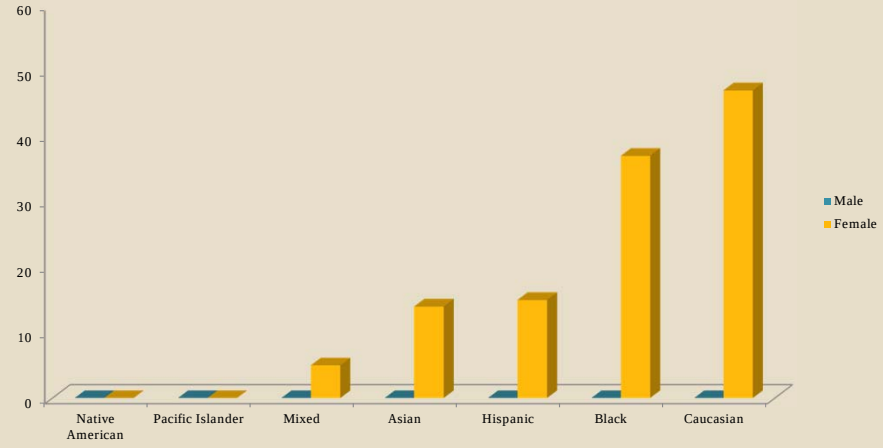

Racial and Ethnic Distribution of the Overall Sample (N=214)

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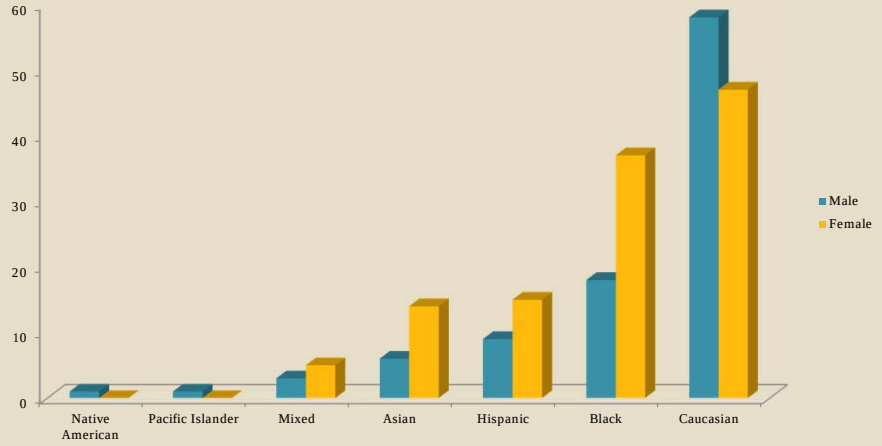

Sample for Research Question 2 (n=82)

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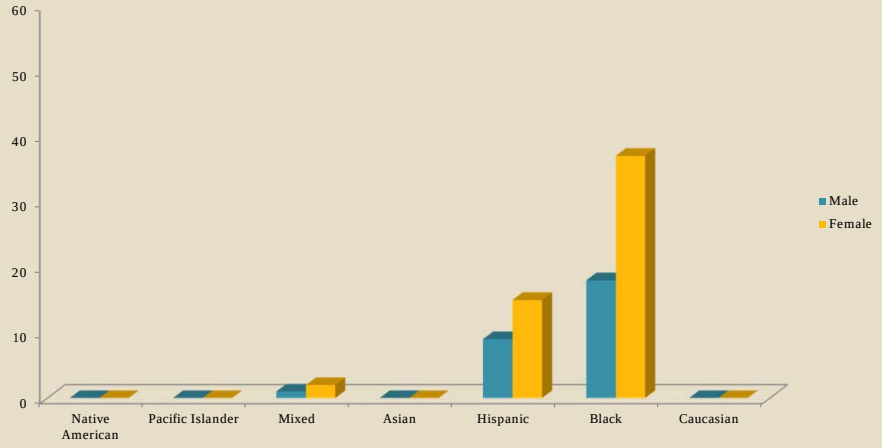
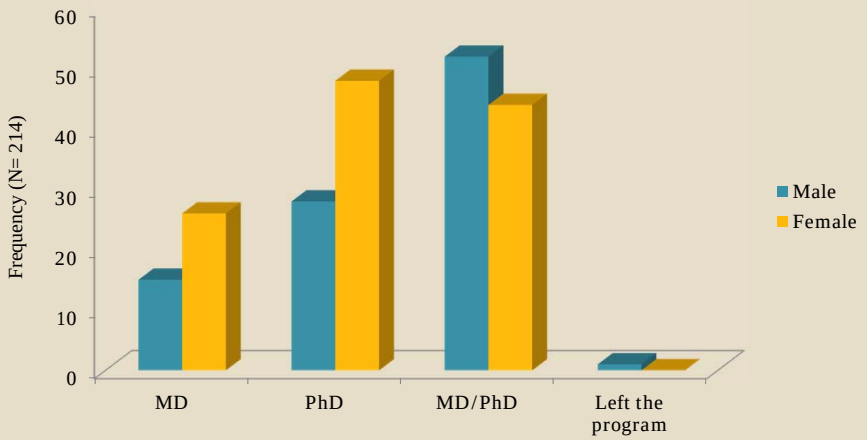


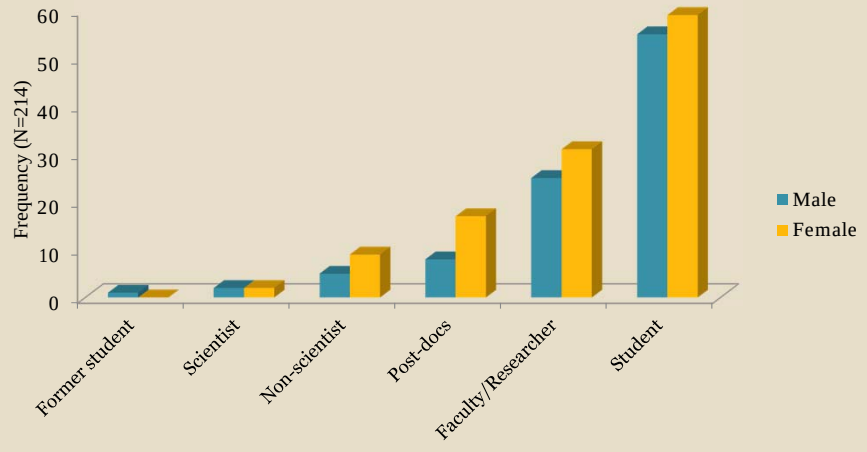
Degree Program Affiliation of the Overall Sample (N=214)

15



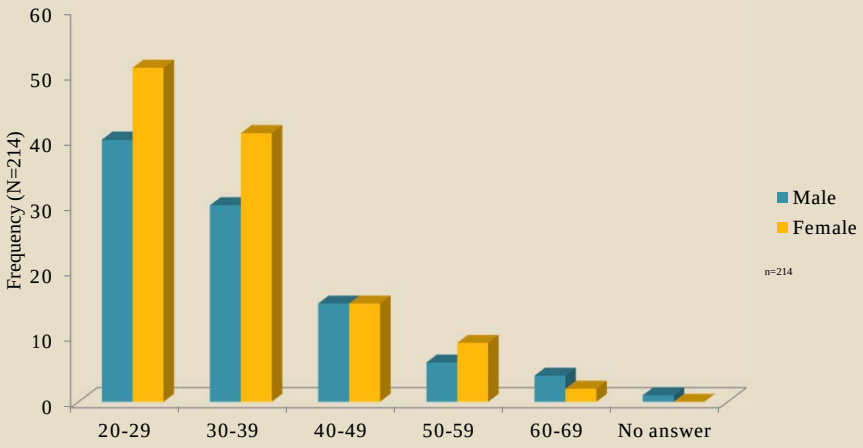
Distribution of the Overall Sample Based on Current Position (N=214)

16



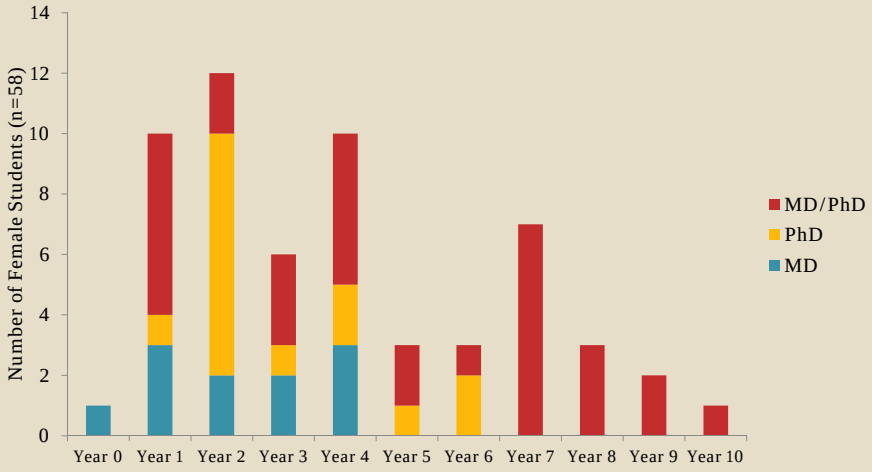
Age Distribution of the Overall Sample (N=214)

17



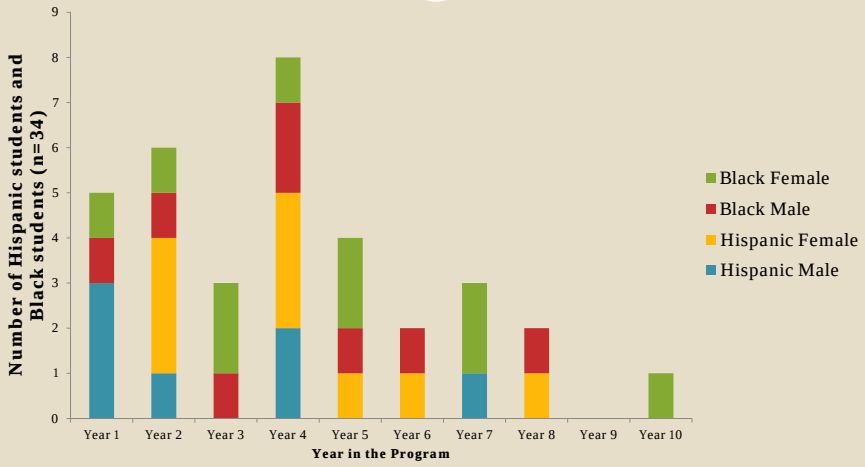
Distribution of Female Students in the Program (n=58)

18



Comparison of Students, Female versus Male, Hispanic versus Black. (n=34)

19



Data Sources and Analysis

20

- Audio recorded files that were transcribed
  - Telephone and in-person interviews
- Grounded Theory
  - Theory development, as compared to the logical deduction based on existing theoretical frameworks (Charmaz, 1983).
  - Grounded in data developed through the course of research (Strauss & Corbin, 1994).
  - Interpretive. Uses interviews, memos, and journals.

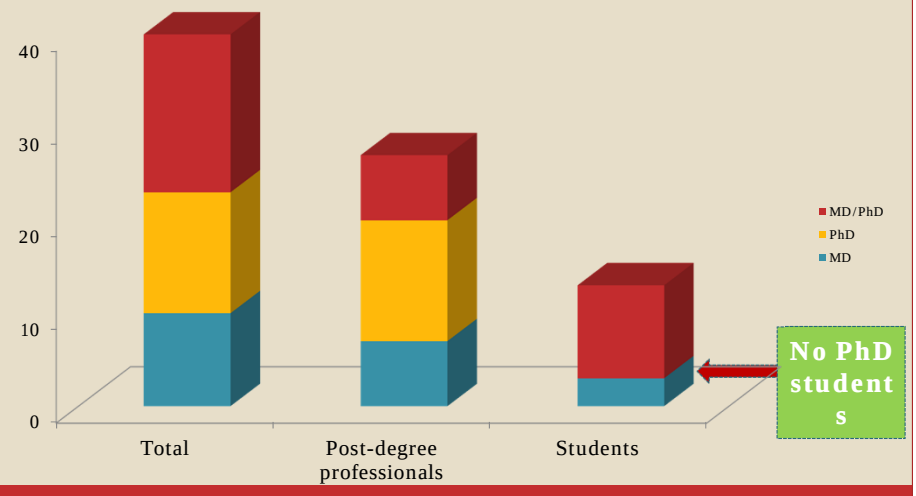
Steps of Grounded Theory

21

- Generate research question
- Determine research sites and participants
- Collect initial data
- Coding (open and in vivo)
- Collect additional data based on coding, memos, and journals
- Axial coding
- Constant comparative method
- Theoretical sampling
- Selective coding among core categories
- Sorting and integrating memos
- Developing a theory

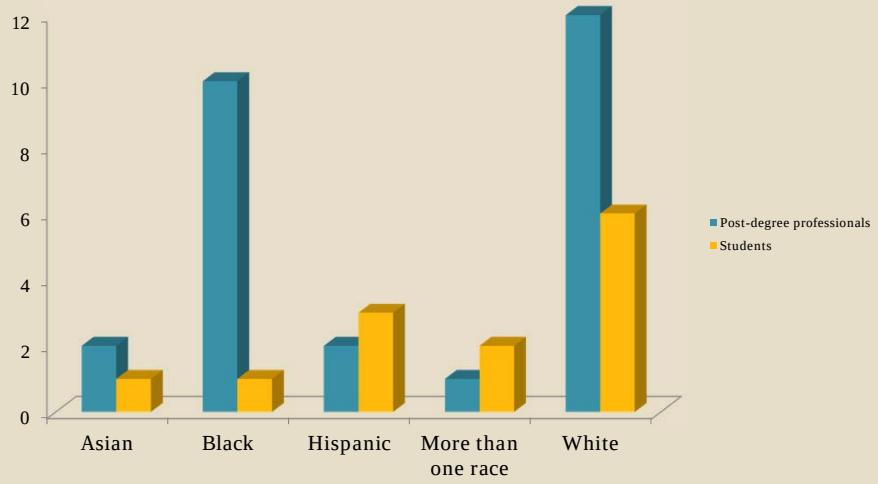
Degree Program Affiliation of Females Reporting Gender-role Barriers (n=40)

22



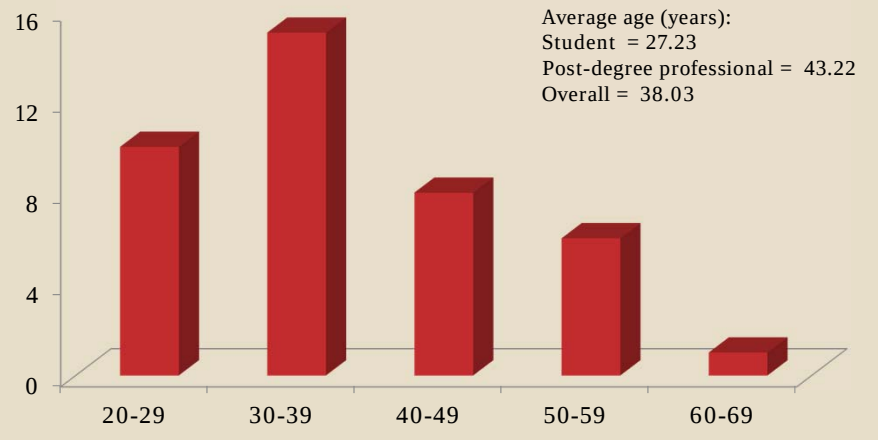
Racial and Ethnic Distribution for Gender-role Barriers (n=40)

23



Age Distribution of Females Reporting Gender-role Barriers (n=40)

24



Age Distribution of Females Reporting Gender-role Barriers (n=40)

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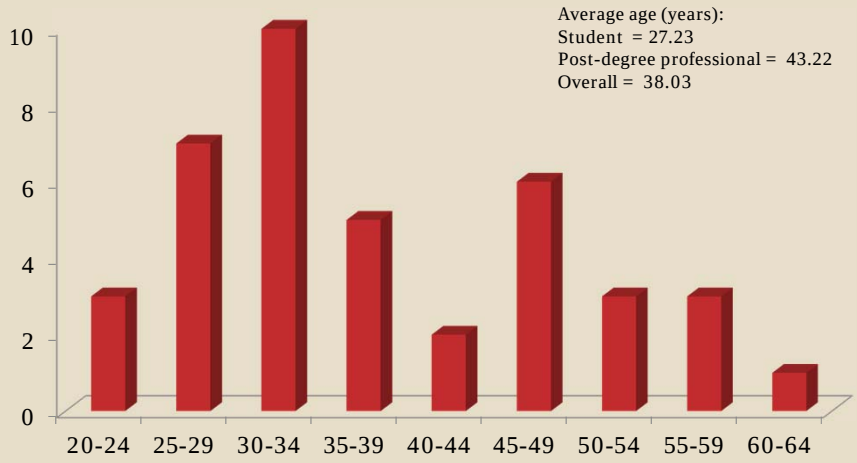
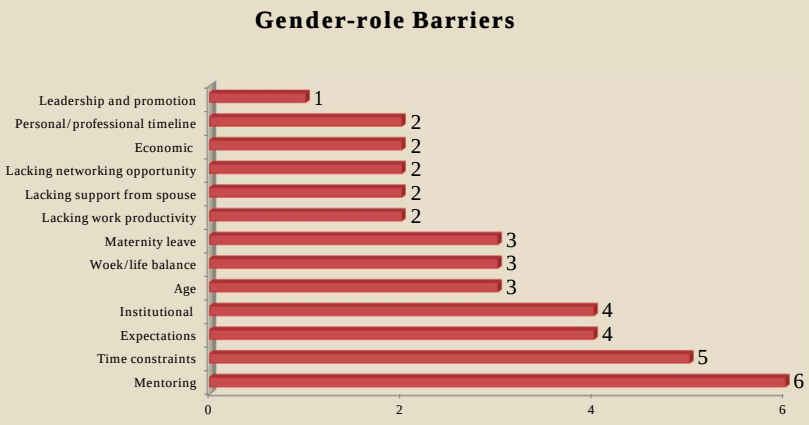


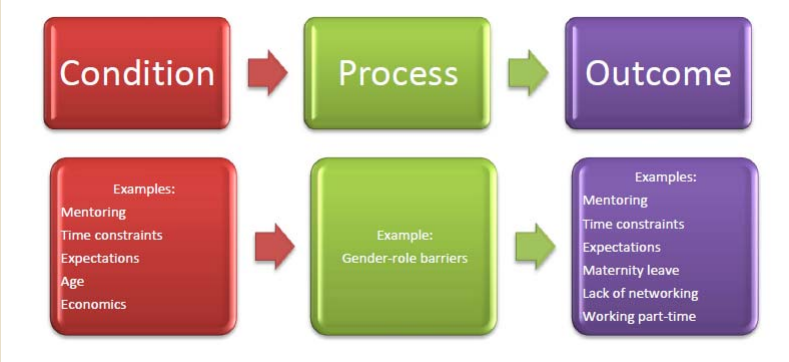
Frequency of Reported Gender-role Barriers in Females

26



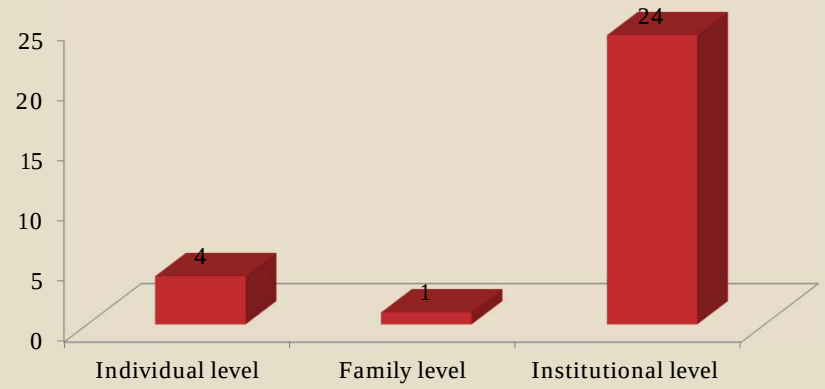
C-P-O Theoretical Framework

27



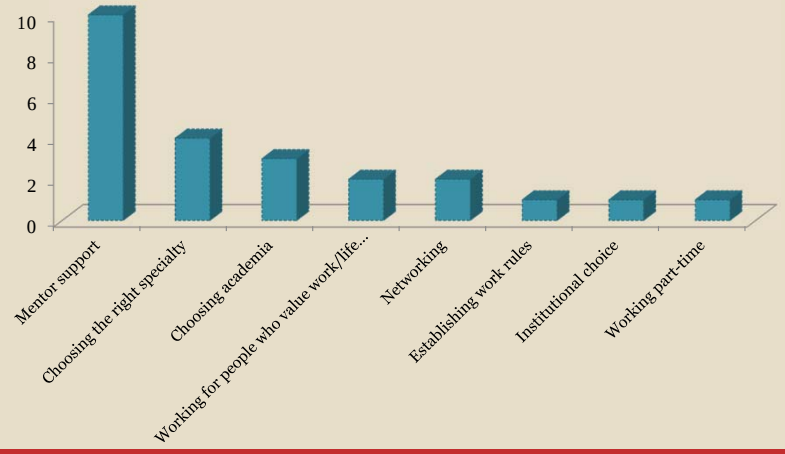
Strategies to Manage Gender-role Barriers

28



Institutional Strategies to Manage Gender-role Barriers

29



Black Males

30

Black Females

31

Hispanic Males

32

Hispanic Females

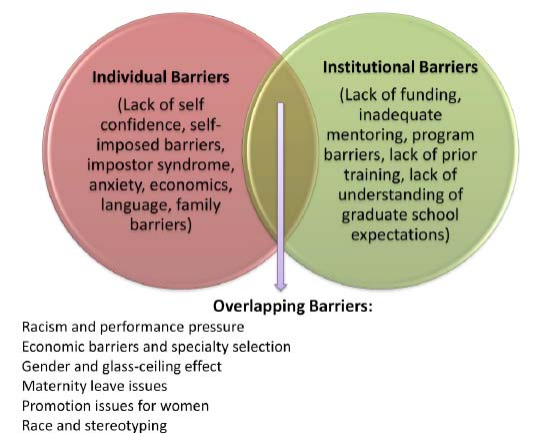
33

Hispanics and Blacks

34

Individual-Institutional Theoretical Framework

35



Implications

36

- Women
  - Women faculty (1/2) and students (1/5).
  - Most frequently reported: Mentoring.
  - Interventions: Good mentorship strategies.
- URMs
  - Qualitatively different for each group.
  - Blacks: Racism, gender barriers (for women) and mentoring.
  - Hispanics: Economic and language barriers.
  - The “one size fits all” strategy might not be effective to strategize interventions.

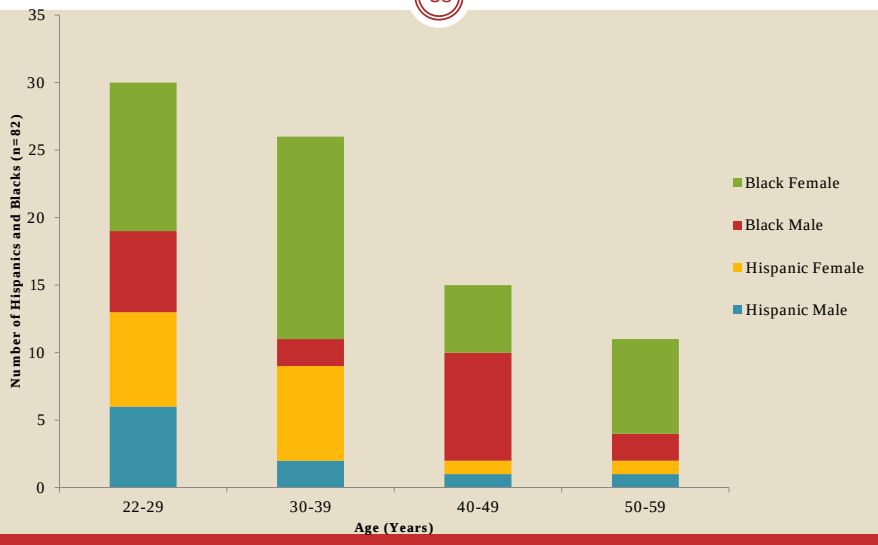
Recommendations

37

- Women
  - Strengthen mentoring relationships.
  - Establish institutional support networks and resource.
  - Working part-time.
- URMs
  - Develop communication skills through mentored participation in presentation/publication.
  - Cultural and racial sensitivity to avoid isolation and exclusion.

Recommendations (Age-specific interventions)

38



Limitations

39

- Mono-method error (interviews).
- Gender-role barriers: How do the experiences of females compare to males?
- How do Hispanics and Blacks compare to Whites?
- Qualitative findings need to be interpreted with caution.

Strengths of this Study

40

- **Robust sample size**
  - n=118 for gender and n=82 for race
  - 87 schools; 4 private companies/non-profit organizations
- **Demographic diversity**
  - Age, gender, race and ethnicity, geographic location, degree program, current occupation, and year in the program.
- **Comparison of Blacks and Hispanics in the same study.**

Future Steps

41

- Designing quantitative studies that examine barriers to success in the field.
- Analysis of barriers reported by Whites, and comparison with racial/ethnic minorities

THANK YOU

Questions?

Blacks (n=56)

43

- Males (n=18)
  - Racism (7)
  - Personal (7)
  - Institutional (4)
- Females (n=38)
  - Gender (11)
  - Racism (9)
  - Mentoring (6)
  - Personality (5)

Hispanics (n=26)

44

- Males (n=10)
  - Economic (4)
  - Language (4)
  - Cultural (3)
  - Institutional (3)
- Females (n=16)
  - Economic (6)
  - Gender-role (5)
  - Personal/Internal attributes (4)

Blacks and Hispanics (82)

45

- Blacks
  - Racism (16)
  - Gender (11)
  - Mentoring (8)
  - Personal (7)
- Hispanics
  - Economic (10)
  - Language (6)
  - Institutional environment (6)
  - Gender-role (5)