Gender Diversity in Computing Doctoral Programs
CRA Workshop on Graduate Women's Recruitment and Retention
November 4, 2007

The Context: Doctoral Education Research-Advising and Retention

Center for Innovation and Research in Graduate Education

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Overview

1. Overview of research on doctoral education
2. Perspectives on gender inequality in doctoral education
3. Discussion questions

Source: CIRGE, University of Washington, Seattle, CRA workshop,11-4-07, Seattle

4 Generations of Research in Doctoral Education

Generation One: 1950- 60

Types of research: research reports commissioned by the Ford Foundation, the National Academy of Science (NRC), NSF, Council of Graduate Schools (CGS)

Purpose: manpower planning in the US for national entities, establishment of CGS as a national professional association of graduate deans

Who: Economists

Methods: (a) testing of economic hypotheses with statistical analyses of NSF (SED) data and follow up data; (b) economic modeling, (c) four-way surveys – faculty, students, graduate deans, professional association

Source: CIRGE, University of Washington, Seattle, CRA workshop,11-4-07, Seattle

4 Generations of Research in Doctoral Education

Generation Two: 1970- 80-90

Types of research: research studies on the American research universities,

Purpose: Understanding the growth of US higher education and its international eminence

Who: senior scholars- sociologists, economists and early higher education researchers

Methods: (a) organizational theory applied to doctoral education (b) case studies of departments and disciplines applying economical approaches of cost benefits and rational behavior

Source: CIRGE, University of Washington, Seattle, CRA workshop,11-4-07, Seattle

4 Generations of Research in Doctoral Education

Generation Three: 1980- 1990- 2000

Types of research: focus on doctoral students, dissertations, individual university studies, Mellon Foundation own research

Purpose: improving institutional effectiveness, examination of best way to allocate money, understanding attrition and long time-to-degree, reducing institutional and human costs

Who: Institutional researchers, higher education scholars, private national scholarship foundation

Methods: (a) survey of students; (b) in-depth interviews, (c) institutional statistical analyses

Source: CIRGE, University of Washington, Seattle, CRA workshop,11-4-07, Seattle

4 Generations of Research in Doctoral Education

Generation Four: 2000 – to current

Types of research: national graduate student surveys by student organizations, dissertations, commissioned studies by private foundations, (Pew, Carnegie)

Purpose: student as consumers have rights, to draw national attention to the situation of graduate students and their employment chances, improve advising

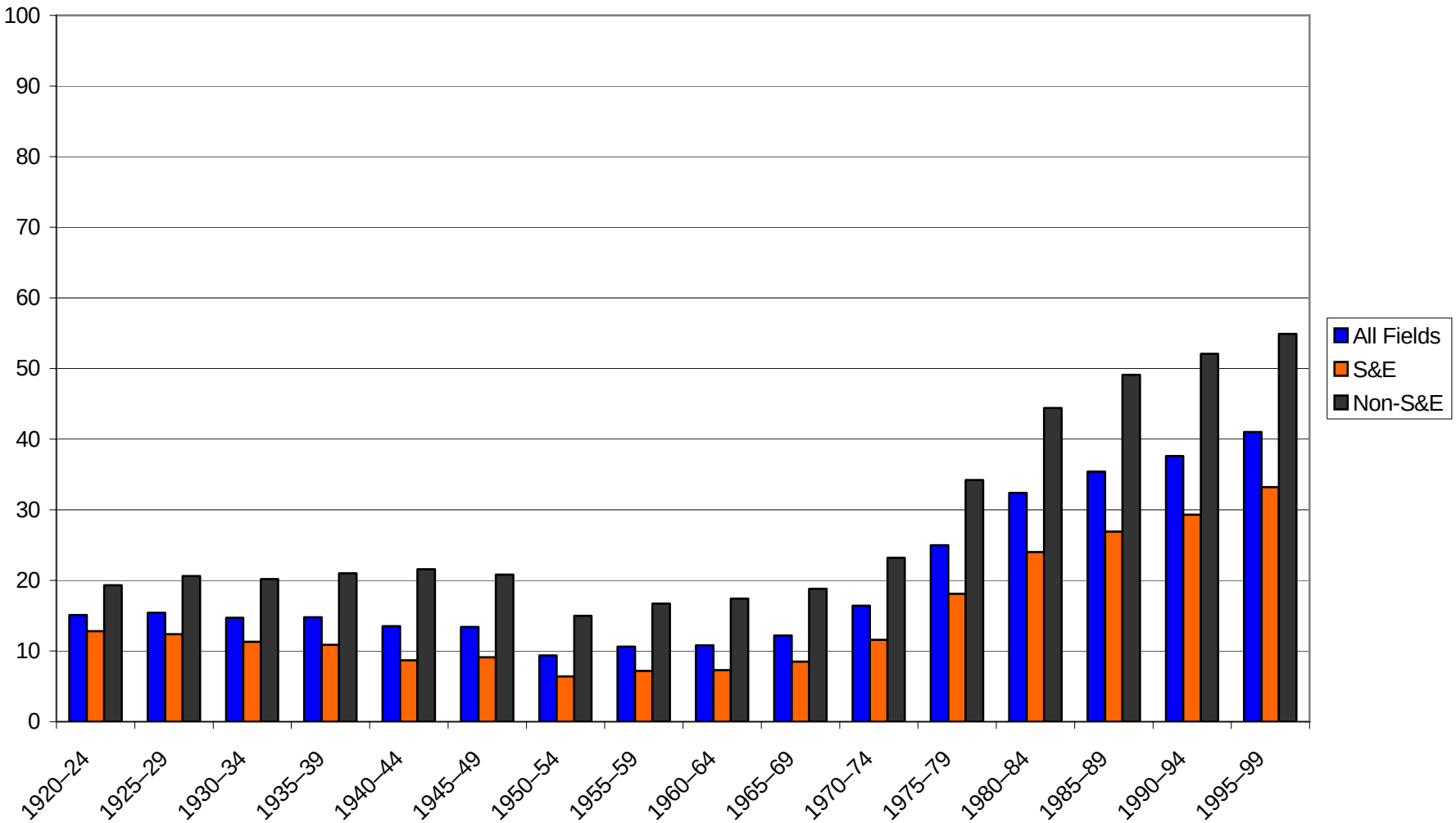
Who: National Association of Graduate Students (AGS), established researchers (sociologists, psychologists, higher education scholars, professional association

Methods: (a) national surveys by current students and PhD recipients, (b) small scale discipline specific studies, (c) focus group discussions, (d) mix methods

Source: CIRGE, University of Washington, Seattle, CRA workshop,11-4-07, Seattle

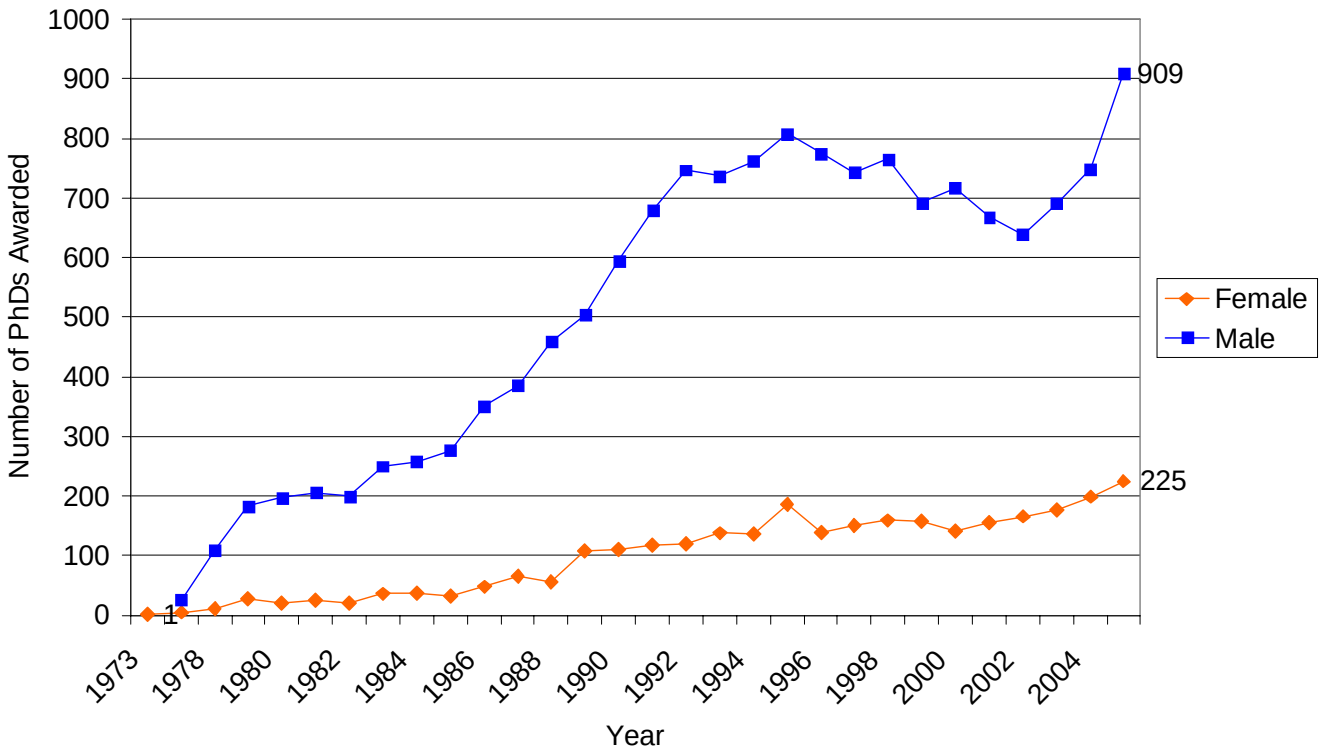
Proportion Women PhDs 1920-1999
in Science & Engineering vs. Other Fields

Source: Thurgood, Golladay, and Hill, 2006, US Doctorates in the 20th Century



Computer Science PhDs 1973 – 2005 by Gender

"Computer Science" PhD first appears in Survey of Earned Doctorates in 1973
Source: WEBCASPAR (NSF)



Source: CIRGE, University of Washington, Seattle, CRA workshop,11-4-07, Seattle

Factors Influencing Attrition & Time-to-Degree

- **Research Mode**
- **Program Structure**
- **Dissertation Definition**
- **Advising**
- **Research Money**
- **Financial Support Types**
- **Campus Facilities**
- **Job Market**

From Maresi Nerad & Joseph Cerny, "From Facts to Action" *CGS Communicator* May 1991

Source: CIRGE, University of Washington, Seattle, CRA workshop,11-4-07, Seattle

Barbara E. Lovitts (2004)

- **"…a key factor in attrition is the inequitable distribution of resources for action and interaction, which creates groups of haves and have-nots in a department."**
- *Source: "Research on the Structure and Process of Graduate Education," in Paths to the professoriate: Strategies for enriching the preparation of future faculty*, ed. Donald H. Wulff, Ann E. Austin, & Associates, 115-136. San Francisco: Jossey-Bass.

Science as Gender Hierarchy

"… men and women … differ widely in their practices. What is especially critical is what does (and does not) constitute a more valued standard …"

Mary Frank Fox (2001) "Women, science, and academia: Graduate education and careers," *Gender & Society* 15(5), 654-66.

Discussion Questions

1. **Is there a difference for women in computer science as compared to other fields?**
2. **Where is computer science in the model of factors affecting attrition and time-to-degree?**
3. **How would a departmental approach to advising women in computer science look?**

Source: CIRGE, University of Washington, Seattle, CRA workshop,11-4-07, Seattle

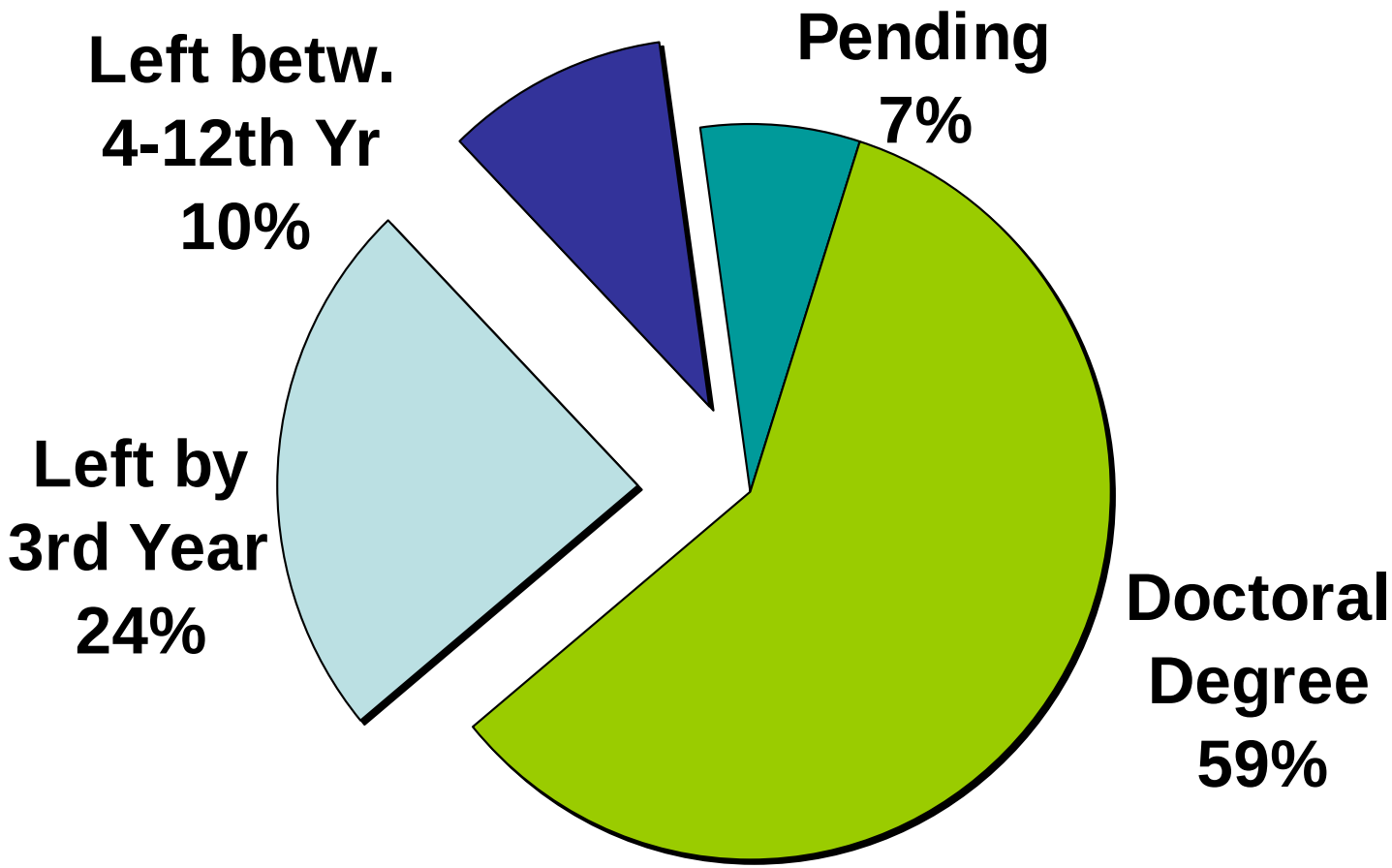
Thank you!

Center for Innovation and Research in Graduate Education

CIRGE website

http://www.cirge.washington.edu

University of California At Berkeley Progression Status 1978-79 Cohorts: after 11 years



as of Nov.,1990

Source: UC Berkeley Graduate Division, CIRGE, UW, Dec., 2002

Source: CIRGE, University of Washington, Seattle, CRA workshop,11-4-07, Seattle

Factors Determining Time to Degree and Attrition: institutional factors I

		Short time / low attrition	Long time / high attrition
1	**Research Mode**	Apprenticeship Mode Team Work Laboratory	Individualistic Learning, Solitariness Library
2	**Structure Of Program**	No MA/MS required QE includes Dissertation Prospectus Annual Evaluation	MA/MS required QE does not include Dissertation Prospectus Sporadic Evaluation
3	**Dissertation Definition**	Test of Future Ability to do Research	Contribution to Knowledge (Book)

Source: CIRGE, University of Washington, Seattle, CRA workshop,11-4-07, Seattle

Factors Determining Time to Degree and Attrition: institutional factors II

	Short time / low attrition	Long time / high attrition
Advising	**Faculty Mentoring** **Departmental Advising**	**Absence of Faculty** **Mentoring and Dept. Advising**
Depart-mental Climate	**Sense of Community** **Students treated as Junior Colleagues**	**Factions among Faculty** **Students treated as Adolescents**
Type of Financial Support	**Research Assistantship** **Fellowships**	**Teaching Assistantship** **Loans, Own Earnings**

Source: CIRGE, University of Washington, Seattle, CRA workshop,11-4-07, Seattle

Factors Determining Time to Degree and Attrition: institutional factors III

	Short time / low attrition	Long time / high attrition
Research **Money**	**Many Sources**	**Few Sources**
Campus Facility **Housing** **Child-care** **Space** **Transportation** **Library**	**Affordable** **Available** **Available** (Office, Meeting) **Efficient, Affordable, Long Hours, Year round**	**Expensive** **Overcrowded** **Overcrowded** **Slow, Expensive** **Short Summer Hours**
Job Market **Postdoc** **Academic** **Industry**	**Many Openings** **Well-paid**	**Few Options** **Medium or Low Salaries**

Source: CIRGE, University of Washington, Seattle, CRA workshop,11-4-07, Seattle