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GTE**

Center for Innovation and Research in Graduate Education

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Defining and Measuring Successful Career Outcomes



Or

The PhD: Journey to Multiple Destination

University of Chicago, April 7, 2006

Professor Maresi Nerad

*Center for Innovation and Research in Graduate Education
(CIRGE)*

University of Washington, Graduate School

Overview



- 1. Introduction: 3 national career path studies**
- 2. Career Paths of former PhD students up to 10-14 years later, including postdocs**
- 3. Combining family and career**
- 4. Perspectives of PhD recipients and their recommendations to current students**

CIRGE Surveys



- **PhD's – Ten Years Later**
- **Art History PhDs – Over a Decade Later**
- **Social Science PhDs – Five+ Years Out**

Empirical Findings from Three US *PhDs –10+ and 5 Years Later Studies*



1. **PhDs—Ten Years Later** (*surveyed 1997*) MELLON FOUNDATION AND NSF FUNDED

61 US universities, 6 disciplines

Survey population: 5,864 response rate: **66%**

- Biochemistry
- Computer Science
- Electrical Engin.
- English
- Mathematics
- Political Science

2. **PhDs in Art History – Over a Decade Later** (*surveyed in 2002*) GETTY GRANT FOUNDATION FUNDED

54 US universities, all art history PhD programs

survey population: 725 response rate: **70%**

Academic Discipline Abbreviation Key



| | |
|-----------|-------------------------------|
| BC | Biochemistry |
| CS | Computer Science |
| EE | Electrical Engineering |
| EG | English |
| MM | Mathematics |
| PS | Political Science |

3. Social Science PhDs – 6+ Years Out

(surveyed 2005/2006) FORD FOUNDATION FUNDED



64 universities, 6 disciplines, **50% response rate** (2,702)

- Anthropology
- Geography
- Political Science
- Communications
- History
- Sociology

Survey instrument:

- Career goals at start and end of PhD education
- Career paths and salary
- Job search and job satisfaction
- Evaluation of doctoral education
- Usefulness of doctoral education
- Family and Career

Academic Discipline Abbreviation Key



AN Anthropology

CO Communication

GE Geography

HI History

PS Political Science

SO Sociology

QUIZ



% tenured 10+ years later?

43%

% tenured at RU1 university?

13%

% who wanted to become a professor?

53%

% who aspired to the professoriate ended up as professor?

54%

% in business, government, non-profit (BGN)?

37%

% who are the group most satisfied in their current job?

Managers/CEO in BGN

Career Paths of former PhD students up to 10-14 years later, including postdocs

Employment Status



10+ Years Later

95% employed

1.5% unemployed

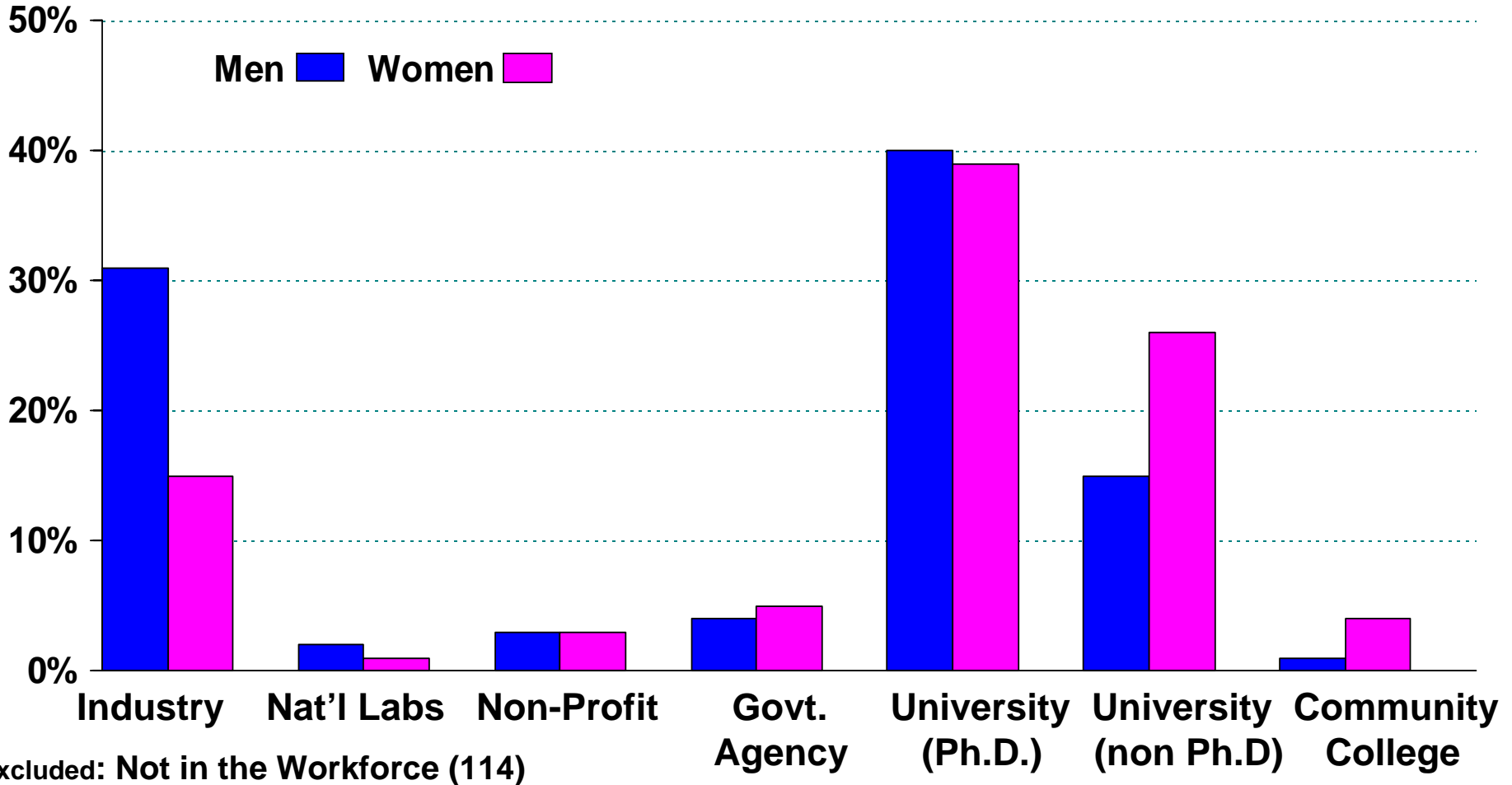
3.5% not in work force

5+ Year Later (social sciences)

98% employed

2% not employed

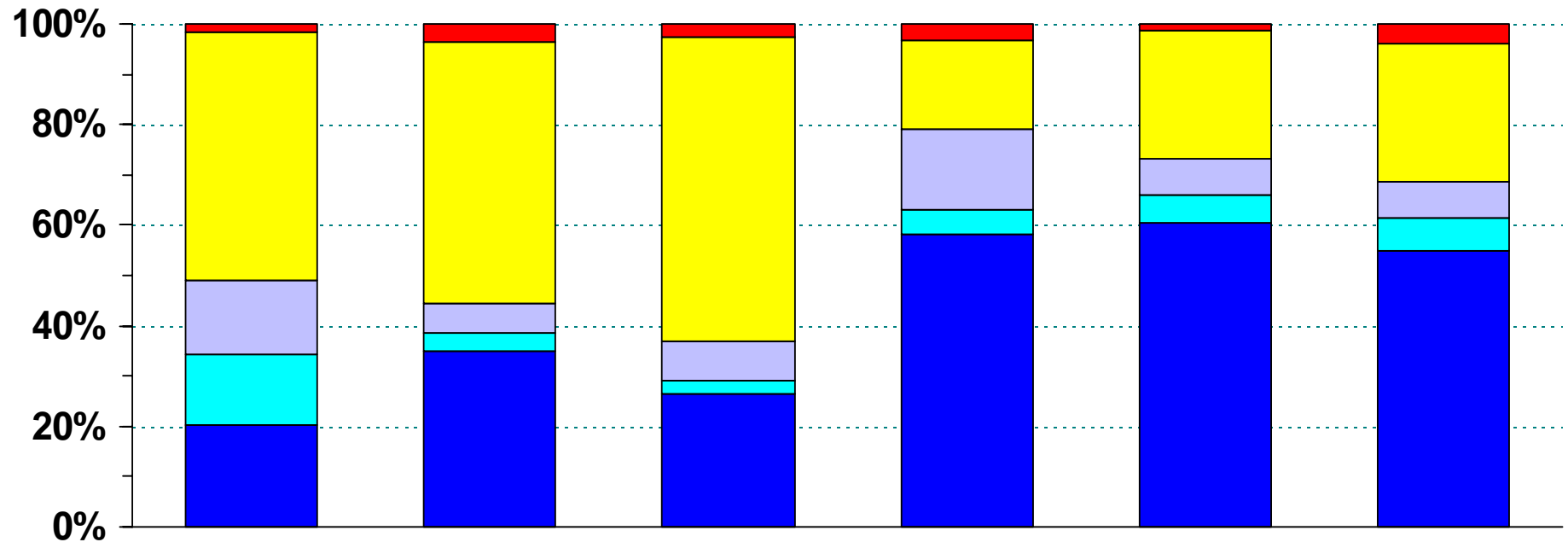
Selected Employer as of Dec 1995 By Gender



Employment at Survey, 1996/97 10+ Years after PhD



■ Tenured
 ■ Tenure Track
 ■ NTT/Acad.Other
 ■ BGN *
 ■ Both Sectors



Biochem.

Comp.
Sci.

Elec.
Eng.

English

Math.

Poli.
Sci.

* B = Business
 G = Government
 N = Non-profits

Employment at Time of Survey (2005/2006) 5+ Years after PhD (SS5)

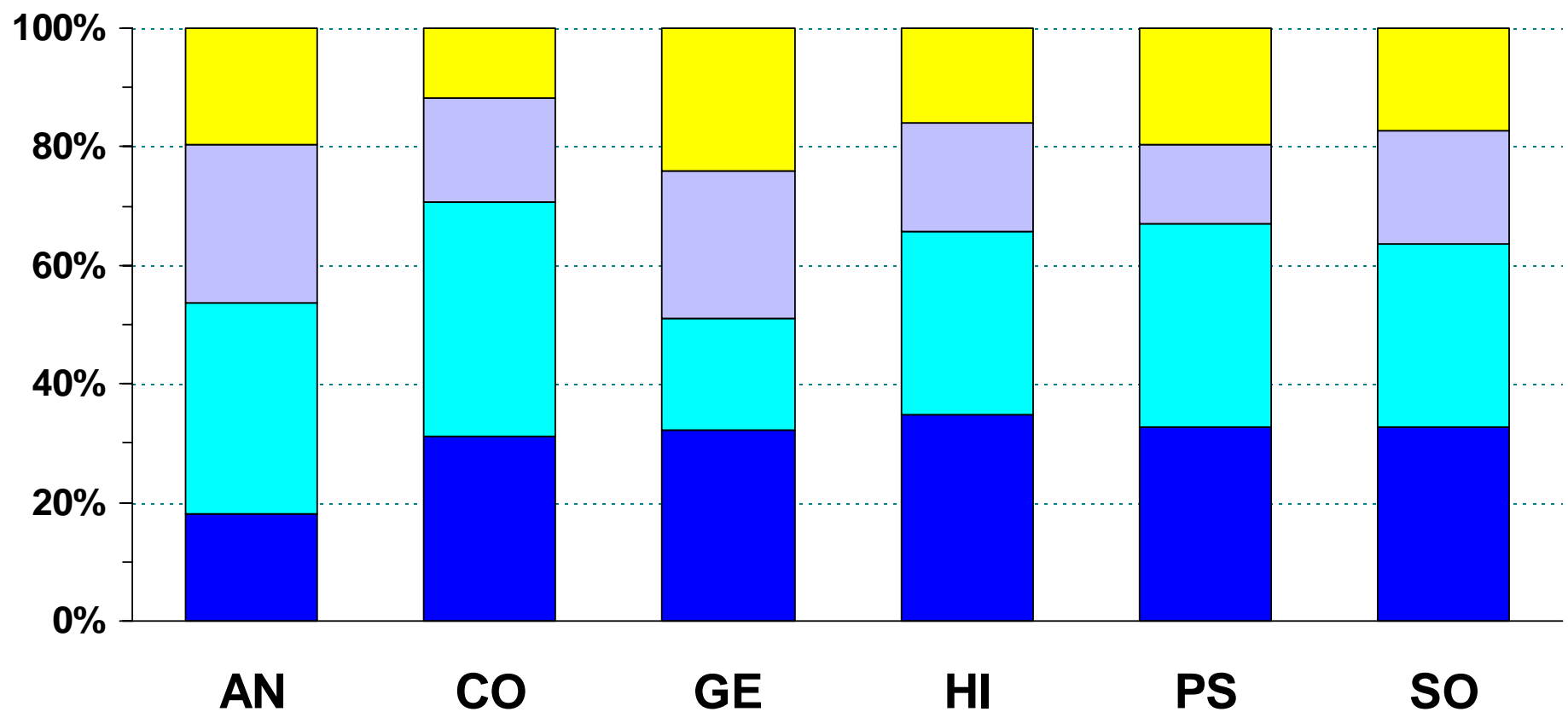


■ Tenured

■ Tenure Track

■ Acad. Other

■ BGN



PRELIMINARY RESULTS

Source: CIRGE PhD-5+ Yrs Later – Social Science 5+ Survey

CIRGE, University of Washington, University of Chicago, PhD Careers 4/07/06

Common Assumption



**All students who you pursue a PhD
want to become professors.**

Career Goal at PhD Completion and Tenured 10-14 Years Later



| | %Want to be Professor | | Total N |
|----------------------|----------------------------------|--|--------------------|
| Biochemistry | 32% | | (345) |
| Computer Sc. | 45% | | (363) |
| Elec. Engin. | 25% | | (504) |
| English | 81% | | (741) |
| Mathematics | 54% | | (703) |
| Political Sc. | 72% | | (472) |

Career Goal at PhD Completion and Tenured 10-14 Years Later



| | (1) % Wanted to Be Professor | (2) % Tenured of (1) | (3) % Tenured of All PhDs |
|-------------------|------------------------------------|----------------------------|---------------------------------|
| Bio-Chemistry | 32 | 34 | 19 (605) |
| Computer Sc. | 46 | 61 | 34 (282) |
| Electrical Engin. | 19 | 67 | 22 (328) |
| English | 81 | 64 | 55 (767) |
| Mathematics | 54 | 73 | 54 (522) |
| Political Sc. | 72 | 66 | 53 (455) |

Career Goal at PhD Completion and % Tenured or Tenure-Track 6+ Years Later

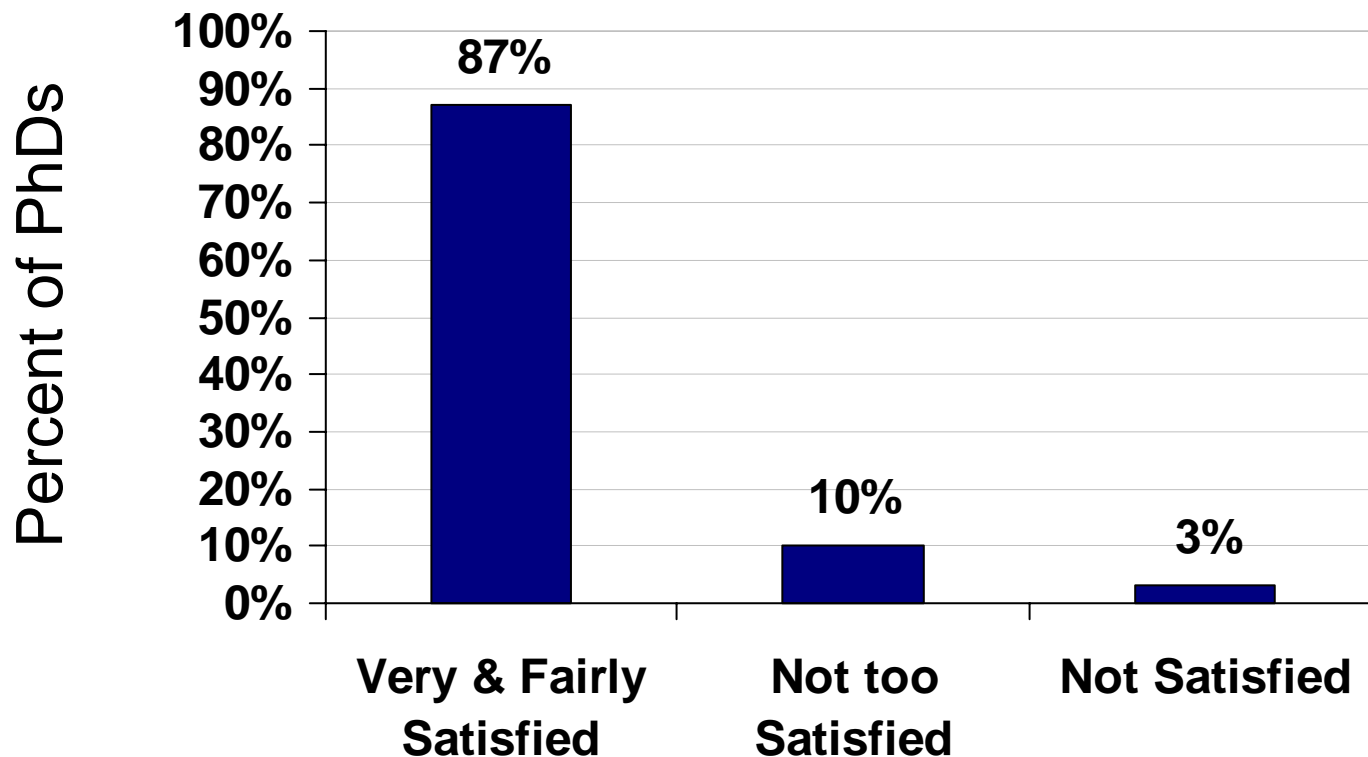


| Major Field | (1) % Want to be Professor | (2) % Tenure + TT of (1) | (3) % Tenure+ TT of <u>All</u> PhDs |
|---------------|-------------------------------------|--------------------------------|---|
| Anthropology | 72 | 60 | 48 |
| Communication | 75 | 77 | 63 |
| Geography | 64 | 70 | 48 |
| History | 84 | 71 | 60 |
| Political Sc. | 77 | 77 | 63 |
| Sociology | 75 | 77 | 60 |

Source: CIRGE PhD 5+ Yrs Later - Social Science 5+ Survey

PRELIMINARY RESULTS

Overall Satisfaction with Current* Job

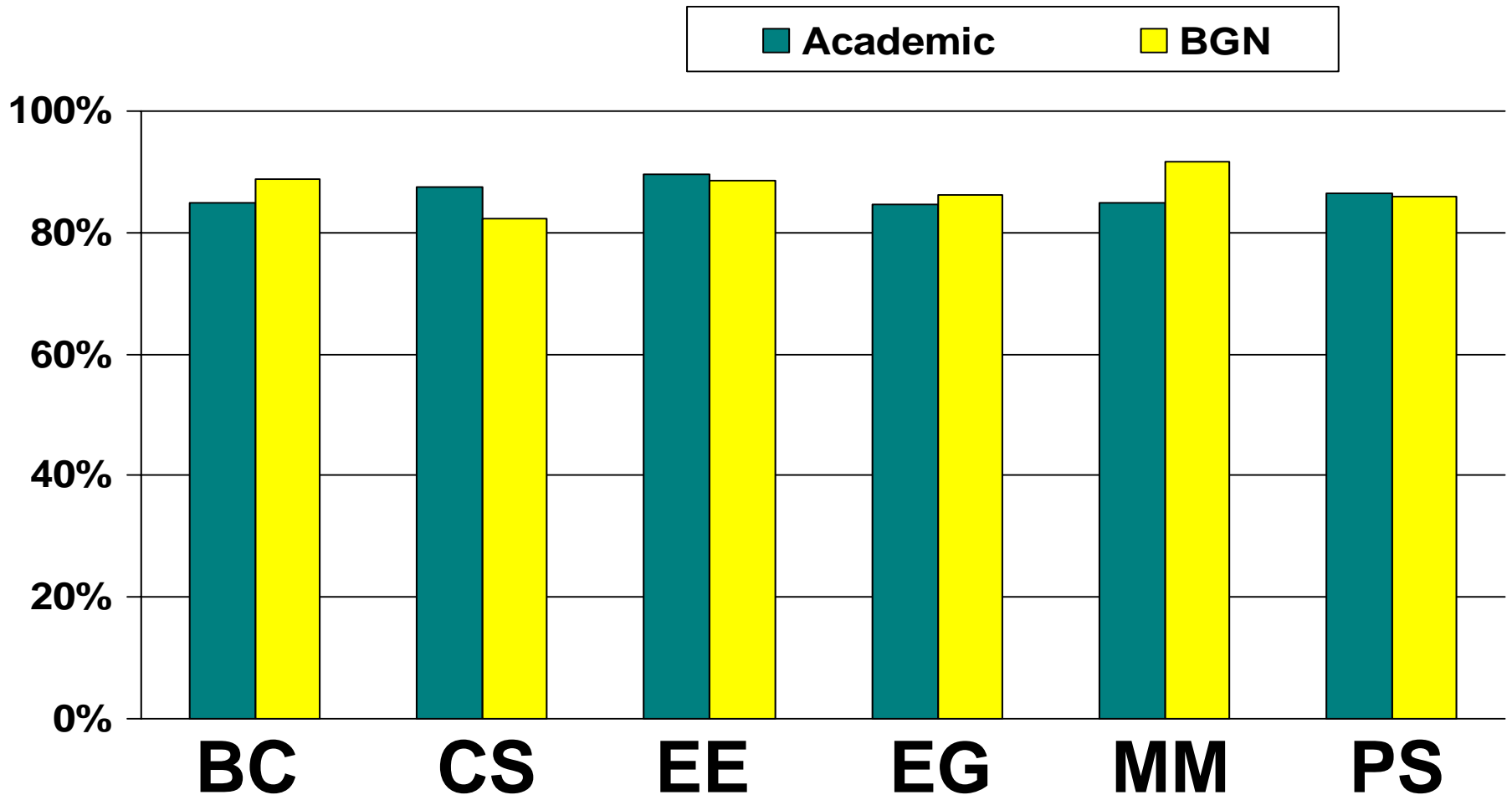


* Job at time of survey, 10+ years post degree completion.

Data Source: CIRGE PHD-10 YRS. LATER (US. Citizens and Perm. Residents Only)
CIRGE, University of Washington, University of Chicago, PhD Careers 4/07/06

Overall Current Job Satisfaction* (very + fairly satisfied) by Sector

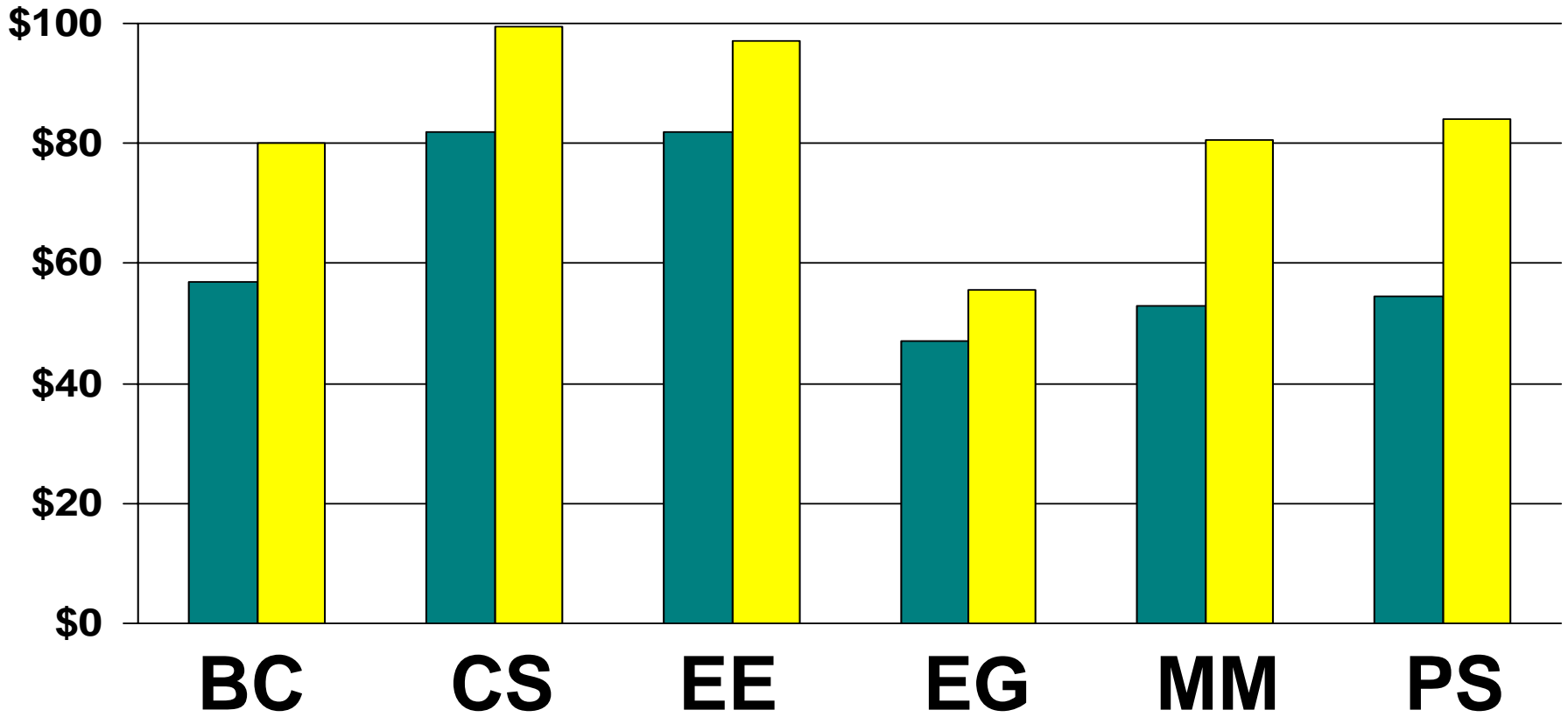
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Total Median 1995 Salary

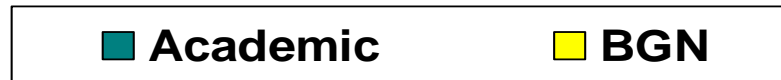


Thousands

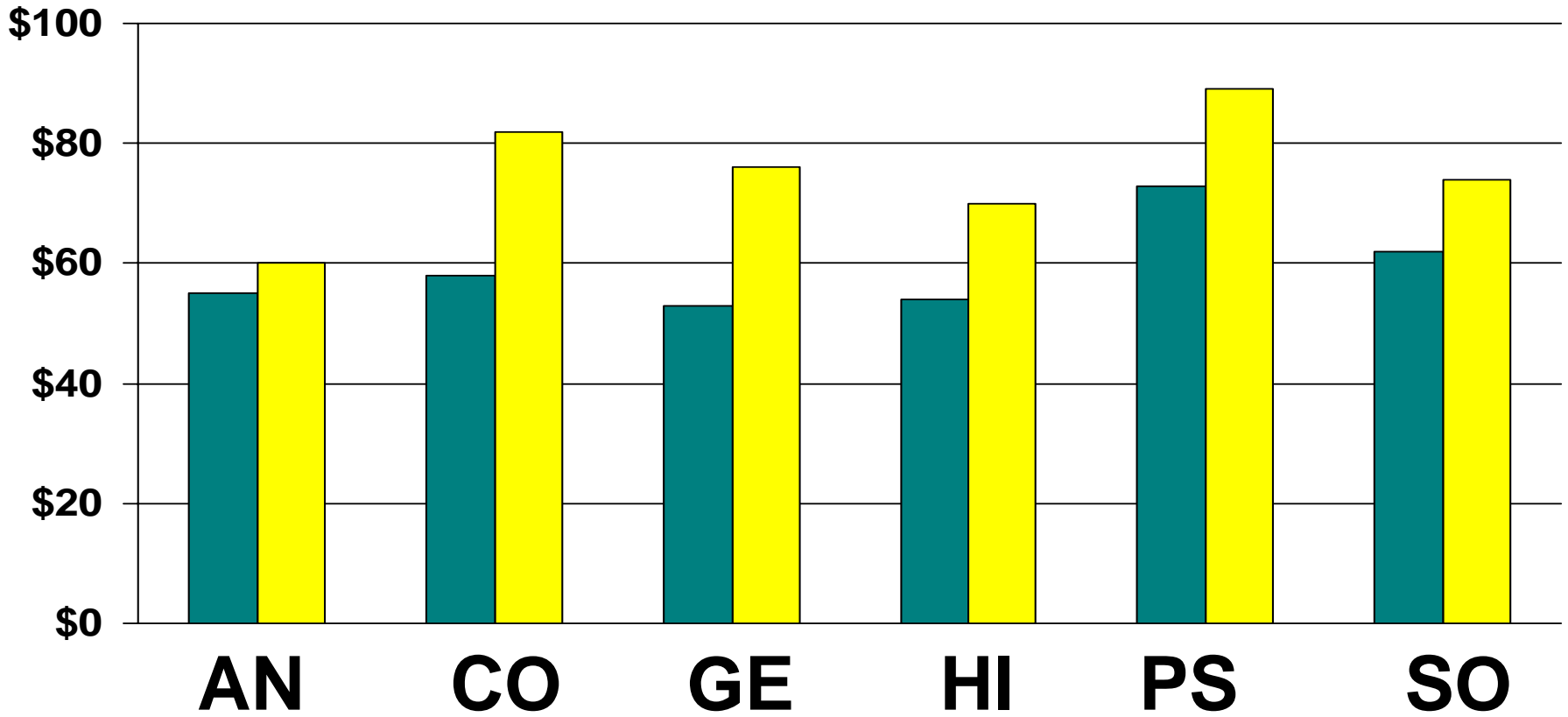


Excluded: Not in the workforce, part time, working outside US.

Median Salary at Time of Survey (2005/2006) among Full-time and Self-employed PhDs: **Social Sciences**



Thousands



Excluded: Not in the workforce, part time, working outside US.

PRELIMINARY RESULTS

Source: CIRGE PhD-5+ Yrs Later – Social Science 5+ Survey

CIRGE, University of Washington, University of Chicago, PhD Careers 4/07/06

Career Paths



Three Major Trajectories: Political Science



**Percent
of Total**

| | | |
|-----------------------------|----------------------------|--------------|
| 1. Faculty | TT to Ten. (219) | → 42% |
| 2. BGN Employees | Business (29) | 6% |
| | Government (21) | 4% |
| | Non-Profit (15) | 3% |
| 3. Crossovers | Acad. to BGN (22) | 4% |
| | BGN to Acad. (10) | 2% |
| | Back and Forth (30) | 6% |

Trajectory 1: Under 2yrs. BGN.

Trajectory 2: Under 1yr. Acad.

Trajectory 3: Over 2yrs. BGN and over 1yr. Acad.

Three Major Trajectories: Computer Science



**Percent
of Total**

| | | | |
|--|----------------------------|----------|------------|
| 1. Faculty | TT to Ten (108) | → | 28% |
| 2. Determined BGN Employees | R & D (76) | | 20% |
| | Mng./Exec. (45) | | 12% |
| | BGN Other (10) | | 3% |
| | Acad to BGN (32) | | 8% |
| 3. Crossovers | BGN to Acad (14) | | 4% |
| | Back and Forth (18) | | 5% |
| | | | 35% |

Trajectory 1: Under 2yrs. BGN.

Trajectory 2: Under 1yr. Acad.

Trajectory 3: Over 2yrs. BGN and over 1yr. Acad.

Postdoctoral Appointments



| Major Field | %Doing Postdoc | Mean Years |
|----------------------|-----------------------|-------------------|
| Biochemistry | 86 | 3.8 |
| Computer Sc. | 7 | 1.6 |
| Elec. Eng. | 9 | 1.6 |
| English | 8 | 2.0 |
| Mathematics | 31 | 2.5 |
| Political Sc. | 9 | 1.5 |

Postdoctoral Appointments



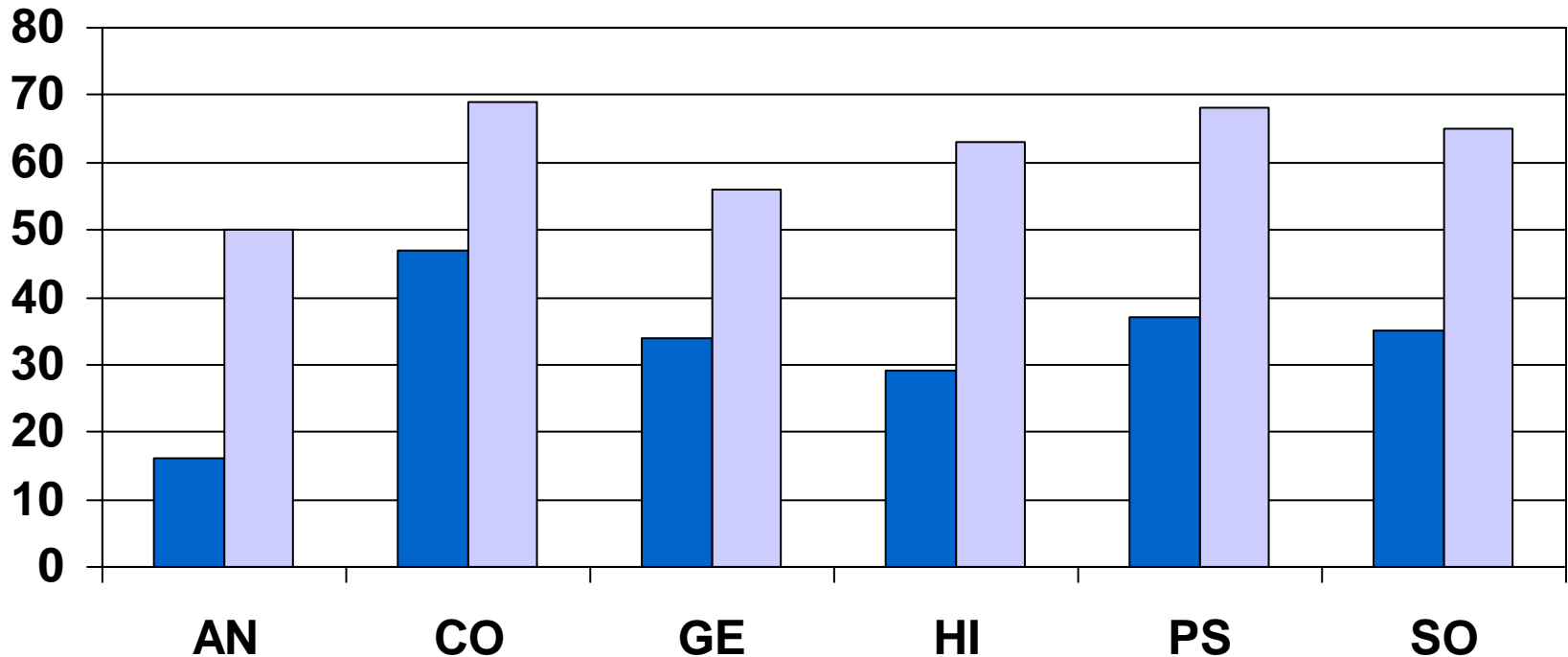
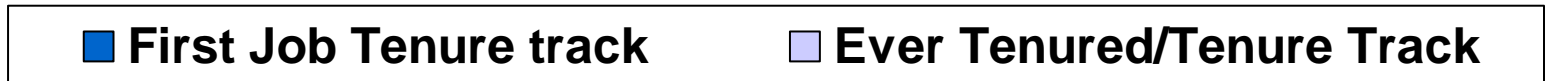
| Major Field | Postdocs | Mean Years |
|--------------------------|-----------------|-------------------|
| Anthropology | 15% | 2.3 |
| Communication | 1% | 1.8 |
| Geography | 10% | 2.1 |
| History | 7% | 1.4 |
| Political Science | 17% | 1.4 |
| Sociology | 17% | 1.9 |

PRELIMINARY RESULTS

Source: CIRGE PhD-5+ Yrs Later – Social Science 5+ Survey

CIRGE, University of Washington, University of Chicago, PhD Careers 4/07/06

% Whose First Job was Tenure Track, and % Ever Tenured/Tenure Track, by Field

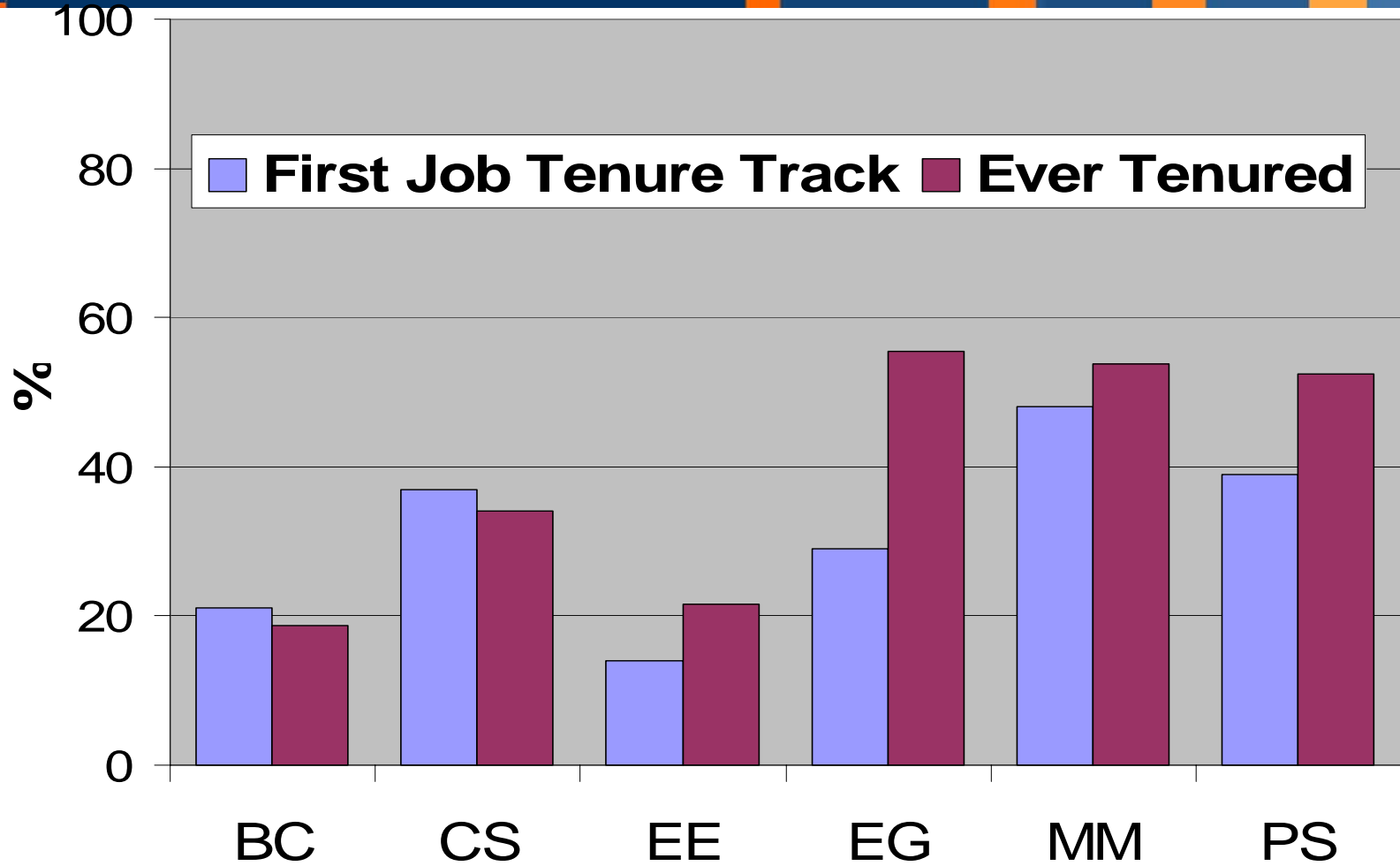


PRELIMINARY RESULTS

Source: CIRGE PhD-5+ Yrs Later – Social Science 5+ Survey

CIRGE, University of Washington, University of Chicago, PhD Careers 4/07/06

% PhDs First Job Assistant Professor and Ever Tenured



Male
TTD: 12
RU1 Pub

Individual Career: Biochemistry

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1982



1996

| Yrs in Job | Job History |
|---------------------------|--|
| 3 | Research IA, Post Doc |
| 5 | Industry A, Director R&D, Biotechnology |
| 6 | Started Own Biotechnology Firm |

Source: "Ph.D.'s--Ten Years Later" Study, Graduate Division, UC Berkeley 1996

Male
TTD: 5
RU1 Pub

Individual Career: Electrical Engineering

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1983



1996

| Yrs in Job | Job History |
|---------------------------|--|
| 3 | Industrial Lab A, Technical Staff Member, Systems Engineering |
| 4 | Industrial Lab A, Materials Development |
| 5 | Industrial Lab B, Contract Development |
| 1 | Started Own High-Tech Co. |

Source: "Ph.D.'s--Ten Years Later" Study, Graduate Division, UC Berkeley 1996

Female
TTD: 12
RU1 Pub

Individual Career: English



Career Goal during doctoral education -
at start: Professor
at end: Acad. Admin.

1983



1996

| Yrs in Job | Job History |
|------------|--|
| 1 | 1 year on academic job market |
| 2 | 1/2 Admin, 1/2 Teaching, RU 1 (temp.) |
| 5 | Assistant Dean for Special Projects, RU1 |
| 6 | Associate Dean Student Life, RU1 |

Male
TTD: 11
RU1 Pub

Individual Career: English



Career Goal during doctoral education -
at start: Professor
at end: Writer / Journalist

1983



1996

| Yrs in Job | Job History |
|------------|---|
| | Never on academic job market |
| 1 | Reporter, local newspaper |
| 6 | Public affairs officer, a State Dept. of Education |
| 1 | Writing consultant (self employed) |
| 1 | Public affairs officer, a State Dept. of Environmental Protection |
| 3 | Public affairs officer, a State Dept. of Health |
| 2 | Director public affairs, State Attorney General's office |

Male
TTD: 4
RU1 Pub

Individual Career: Mathematics

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1983



1996

| Yrs in Job | Job History |
|------------|---|
| 2 | Research IA, Visiting Assistant Professor, Post Doc |
| 5 | Research IB, Assistant Professor, Tenure Track |
| 3 | Computer Industry A-Research Fellow |
| 2 | Financial Industry A, Vice President |
| 2 | Financial Industry B, Partner |

Source: "Ph.D.'s--Ten Years Later" Study, Graduate Division, UC Berkeley 1996

Male
TTD: 11
RU1 Priv

Individual Career: Political Science



1985



1996

| Yrs in Job | Job History |
|------------|---|
| 1 | MA IA, Assistant Professor, Tenure Track |
| 2 | Federal Agency A, while student in Research Public Health Program |
| 1 | BA IIA and BA IIB, Assistant Professor (Non Tenure) |
| 1 | Federal Agency A, Examiner |
| 1 | Same: Statistician |
| 5 | Federal Agency B, Statistician |
| 1 | Same: Project Manager |

Source: "Ph.D.'s--Ten Years Later" Study, Graduate Division, UC Berkeley 1996

Educational Level of Partner of PhDs by Gender (all fields)



Women in the Survey

Partnered with PhD/Lawyer
or Medical Doctor: **61%**

Men in the Survey

Partnered with PhD/Lawyer
or Medical Doctor: **27%**

Educational Level of Spouse by Gender and Field



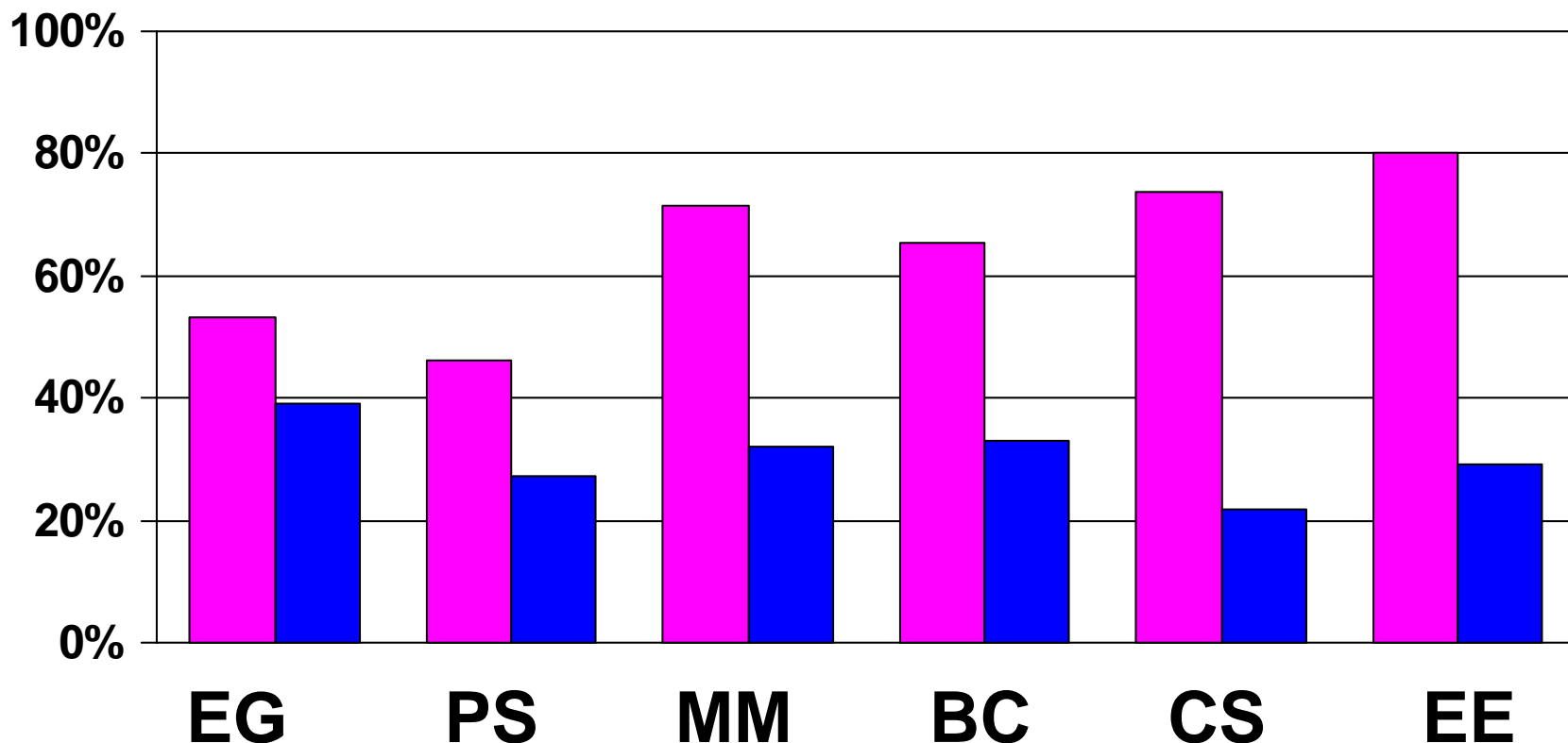
AT PhD completion married **women/**
men BIOCHEMISTS had spouses with
PhD/JD/MD (1997): **75% / 24%**

AT PhD completion married **women/**
men MATHEMATICIANS had spouses
with PhD/JD/MD (1997): **84% / 25%**

“Good Opportunities for My Partner” Very Important in First Job Choice

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Married Women Married Men



Ever Tenured by Family Trajectories and Gender: *Art History*



| | Women | Men |
|---|------------|------------|
| Single w/o Children | 53% | 54% |
| Stable Relationship w/o Children | 52% | 76% |
| Stable Relationship w/ Children | 38% | 81% |

Family & Graduate School (quotes from art history survey)



- **“ ... being single [in graduate school] simplified things but also made it difficult due to the lack of a companion for moral support”**
- **“ ... [due to my marriage] I was unable to accept internships, temporary teaching appointments, and a prestigious seminar. Studied hard to escape bad marriage ...”**
- **“I was always married. I felt little financial pressure, but I had less freedom to pursue all career options.”**

Family & Career

(quotes from art history survey)



- **“I have been reluctant to change jobs in part because I do not want to disrupt my children’s lives.”**
- **“My spouse followed me when I got a tenure-track position. He worked as a visiting professor for 5 years ... until he was hired in a tenure-track position ...”**
- **“My husband’s job has always been in New York City, so I have been limited to employment in this area.”**

Perspectives of PhD recipients and their recommendations to current students

Worth Completing the Ph.D?



**Definitely
Worth It**

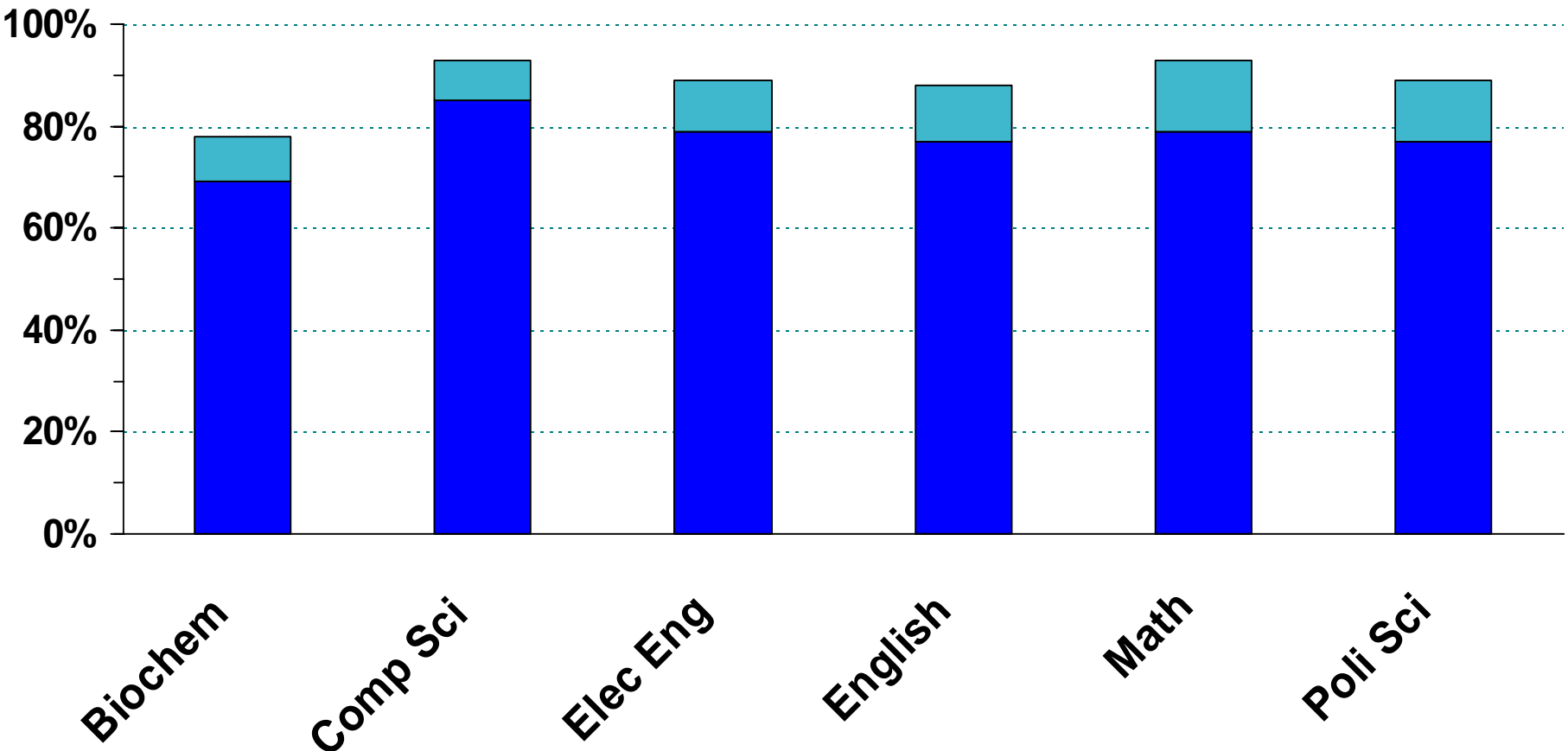
| | |
|-----------------------------------|------------|
| Biochemistry | 72% |
| Computer Science | 76% |
| Electrical Engineering | 80% |
| English | 74% |
| Mathematics | 81% |
| Political Science | 80% |

Would you do the Ph.D. again? By Field



■ Yes, Same Field

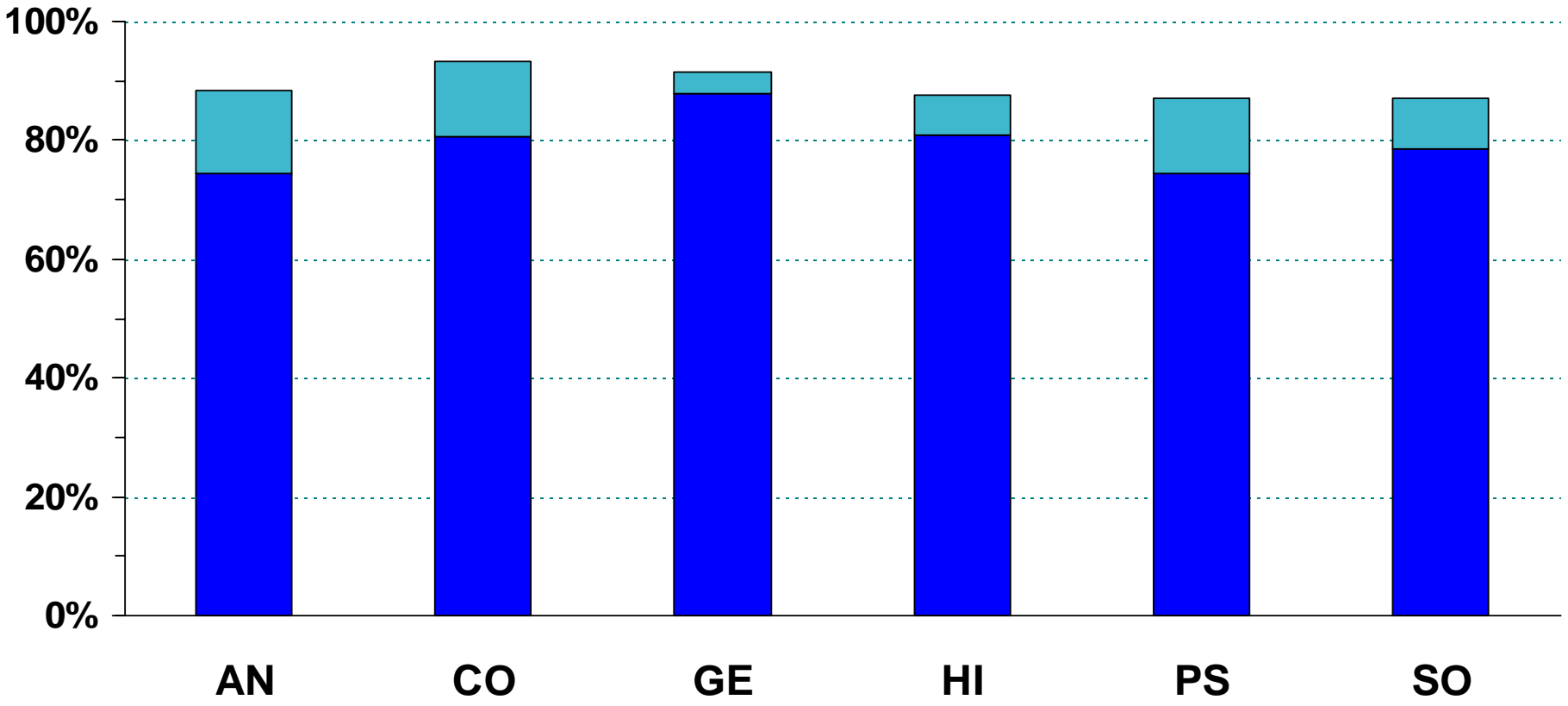
■ Yes, Different Field



Would You Do the PhD Again in Same Field or Different Field?



■ Yes, Same Field
 ■ Yes, Different Field



PRELIMINARY RESULTS

Source: CIRGE PhD-5+ Yrs Later – Social Science 5+ Survey
 CIRGE, University of Washington, University of Chicago, PhD Careers 4/07/06

Recommendations for Doctoral Students

Open-Ended Question: 3 Most Cited



| | BC | CS | EE | EG | MM | PS |
|---------------------------------|----|----|----|----|----|----|
| Be Interdisc./Breadth | 2 | 1 | 1 | - | 1 | 3 |
| Focus, Define Goals | 1 | 2 | - | - | 2 | 2 |
| Choose Field You Love | 3 | - | - | 1 | 3 | - |
| Choose Advisor Carefully | - | 3 | - | - | - | - |
| Develop Teaching Skills | - | - | - | 3 | - | - |
| Publish/Present Papers | - | - | - | 2 | - | 1 |
| Get Hands-On Experience | - | - | 2 | - | - | - |
| Work Hard | - | - | 3 | - | - | - |

Assessment by PhDs of Importance of Learning Teamwork During PhD Education by Sector



Academic BGN

Important*
100%

80%
60%
40%
20%
0%

BC

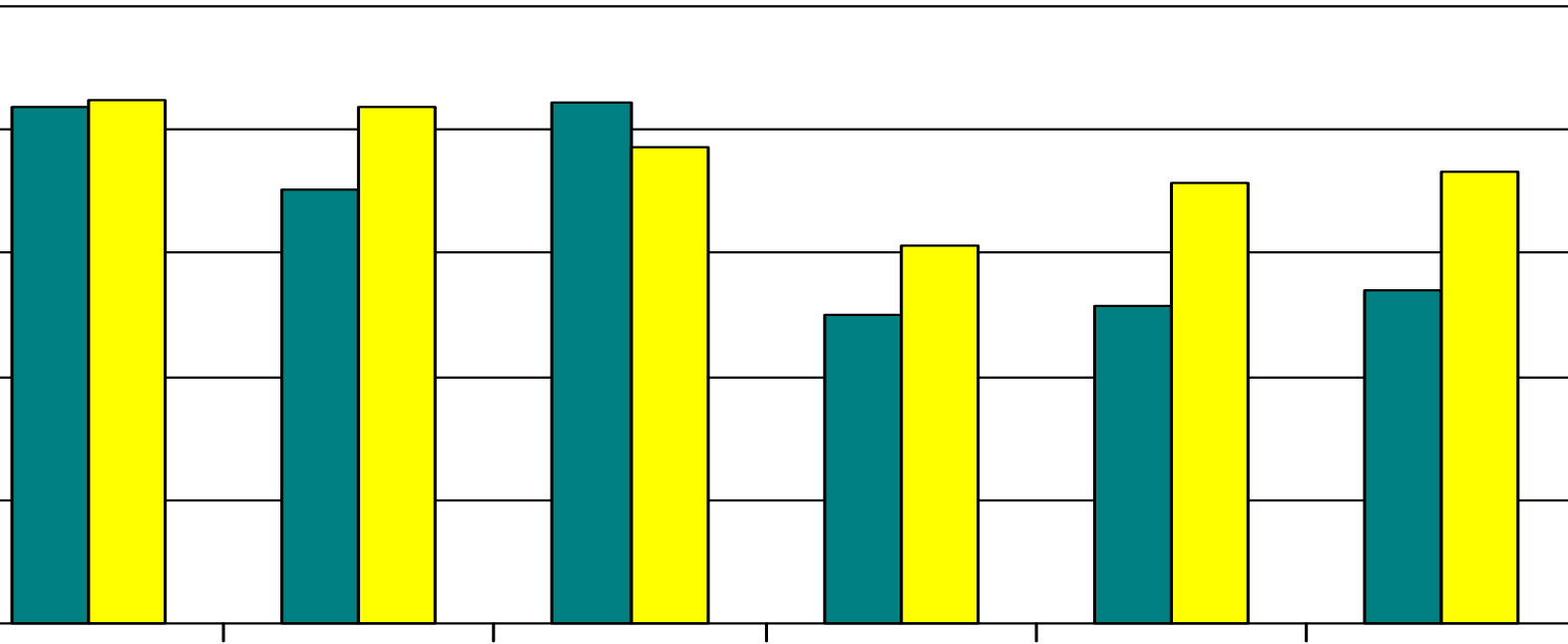
CS

EE

EG

MM

PS



Recommendations for Graduate Students



- **Be proactive in seeking help with your professional development and job search**
- **Negotiate with your life partner about changing or leaving jobs; interrupting or delaying careers; moving; or living or working in a different area**

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Research

National Data Bank for Career Path Analysis of PhDs

- ✓ PhDs—Ten Years Later
- ✓ PhDs in Art History—Over a Decade Later
- ▶ Social Science PhDs—Five Years Out

Development of 3-year series of international workshops *Forces & Forms of Doctoral Reform Internationally*

Toward an evaluation of international collaborative doctoral programs
✓ Germany (GK)

Toward an evaluation of the IGERTs' impacts on departments and this university as a whole

Innovation

IGERT

Professional development workshops for faculty, students, and staff

Policy Recommendations

Thank you!



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