

[www.cirge.washington.edu](http://www.cirge.washington.edu)

**CIR  
GTE**

Center for Innovation and Research in Graduate Education

**RESEARCH**

**INNOVATION**

**POLICY**

**PUBLICATIONS**

Supporters

Contact CIRGE

Conferences

# Defining and Measuring Successful PhD Career Outcomes



**Professor Maresi Nerad**

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

**University of Washington, Seattle, Graduate School**

**European Summer Conference**

**New Dimensions for Doctoral Programs in Europe: Training,  
Employability +the European Knowledge Agenda**

**Florence, July 8th, 2006**

# Overview



1. Overview of existing (EU+US) **national** PhD recipients career and educational outcome surveys
2. Purpose, uses, and usefulness of survey information
3. Questioning traditional assumptions about doctoral program quality using career outcome measures

# Existing National Doctorate (PhD) Career Outcome Surveys



**(Europe)**

- **UK Grad Programme: What do PhDs do?**
- **UNESCO/OECD/Eurostat:**
  - **Careers of Doctorate Holders**

# Existing National Doctorate (PhD) Career Outcome Surveys



**(US)**

- **National Science Foundation**
  - **Survey of Earned Doctorates (SED)**
  - **Survey of PhD Recipients (SRD)**
- **CIRGE, University of Washington**
  - **PhDs– Five and Ten Years out Surveys**

# UK Grad Programme: What do PhDs do? (WDPD)



## Project (2004)

- **Commissioned by UK Grad Programme with Graduate Prospect**
- **Statistics from the Higher Education Statistical Agency (Destination of Leavers from Higher Education, 1973)**

## Purpose

- **For PhD candidates: make informed career decisions**
- **For supervisors: understand potential careers, transferable nature of PhDs**
- **For employers: what PhDs can offer them**
- **To illustrate the diversity of PhD population**

## Content:

- **Employment by sector and titles, unemployment, postdoc (0-18 months after PhD) by field of study**
- **Demographics**
- **“viewpoints and messages from key organization and individuals”**

# Strength + Limitations

## UK What Do PhDs do? (WDPD)



### Strength:

- Annual census information of UK doctoral recipients first jobs 0-18 months at degree award

### Limitations:

- No career progression /path information
- No reasons for job choice
- Short application of knowledge and skills acquired
- No assessment/ information for individual institutions/quality of education/program

# UNESCO/OECD/Eurostat

(in development)



## Project by

- the UNESCO institute for Statistics, OEC, Statistical Office of the European Commission

## Purpose

- To collect internationally (European?) comparable statistics of PhD, **annually?**
- To establish and analyze trends on career paths - workforce development
- To ensure career development of highly qualified people all over the world

## Content (**longitudinal survey?**)

- statistics on educational history including financial support
- work experience (postdoc appointments), unemployment
- Career productivity (publication & patents, )
- Job satisfaction and salary
- International and intro-sector mobility



# Strength + Limitations

UNESCO/OECD/Eurostat

(in development)



## Strength:

- Well designed, comprehensive survey on employment  
Captures reasons for international mobility
- International comparison possible

## Limitations:

- No assessment of doctoral education experience
- No possibilities for individual institutional adjustments
- Unclear access to data level, no tool for doctoral education program improvement

# US Survey of Earned Doctorates (SED)



## **Project (since 1958)**

- **Coordinated by the National Science Foundation (NSF) on behalf of 6 federal agencies,**
- **administered by the Nat. Opinion Research Center (NORC)**

## **Purpose**

- **To annually collect statistics of new doctoral recipients**
- **To establish trend analyses over time**
- **To Provide information for labor market planning**

## **Content:**

- **Educational history**
- **Sources of financial support**
- **Immediate plans after doctorate completion**
- **Demographics**

# Strength + Limitations

## US Survey of Earned Doctorates (SED)



### Strength:

- Annual census information of US doctoral recipients
- Information of indebtedness
- Parental education

### Limitations:

- No assessment of doctoral education experience
- No actual employment information, only plans

# US Survey of Doctorate Recipients (SRD)



## Project (since 1973)

- NSF + NIH, administered by the Nat. Opinion Research Center (NORC)

## Purpose

- To biannually collect longitudinal panel survey information, surveys people until age 76
- To provide estimates of characteristics of Science & Engineering workforce, for workforce development planning

## Content:

- Selected fields & only for those remaining in the US
- Employment information
- Job satisfaction
- Publication, patents
- Further employment training

# Strength + Limitations

## US Survey of Doctorate Recipients (SDR)



### Strength:

Detailed employment information

### Limitations

- Cannot be used for analyzing PhD career outcomes by doctoral programs, departments or individual universities
- No possibilities for individual institutional adjustments
- No tool for doctoral education program improvement

# Center for Innovation and Research in Graduate Education Surveys

## CIRGE Surveys (5-10 Years Out)



### Project by

- The national Center for Innovation and Research in Graduate Education at the University of Washington, Seattle, funded by Ford Foundation

### Purpose

- To collect national comparable statistics of PhD career and educational outcomes by program, departments, and universities
- To provide data & analyses of career path information, assessment of doctoral program quality, and usefulness of the doctoral degree to graduate deans, department chairs, disciplinary professional associations, and students
- To improve doctoral education

### Content

1. Career goals at start and end of PhD education
2. Career paths and salary
3. Job search, reasons for job selection
4. job satisfaction
5. Family and career
6. Evaluation of PhD education
7. Usefulness of PhD education

# Strength + Limitations

## CIRGE surveys



### Strength:

- Detailed user-friendly information on career path and job choices
- Allows for user adjustments
- Allows for comparison of quality assessment of doctoral programs, department, or universities
- Includes professional development of doctoral students (generic skills)
- Allows for capturing career development in the context of partner/family information

### Limitations:

surveys major fields of studies every 3 years

# Relevant Questions about PhD Careers and Educational Outcomes



- 1. Are PhDs employed? in what sectors, in which organization, in what positions?**
- 2. What are influential factors, such as career goals, relationships, and family influences, future-oriented scholarly employment preparedness?**
- 3. How useful is the doctoral education for the subsequent career path?**
- 4. How satisfied are PhDs with their careers?**
- 5. Does career outcomes information relate to doctoral program quality?**
- 6. What kind of information is needed to provide feedback to doctoral programs to improve their quality?**



# **Questioning traditional assumptions about doctoral program quality using career outcome measures**

# 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%**

# 3. Social Science PhDs – 6+ Years Out

(surveyed 2005/2006) FORD FOUNDATION FUNDED



64 universities, 6 disciplines, **50% response rate** (3,332)

- 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

# Common (*incorrect*) US Assumptions about US PhDs



- 1. All PhD students want to become professors.**
- 2. The “best” PhD students do become professors.**
- 3. PhD recipients’ career paths are linear and smooth.**
- 4. Everybody can take the best job offered.**
- 5. Academic staff enjoy the highest job satisfaction**

# Common Assumption 1



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

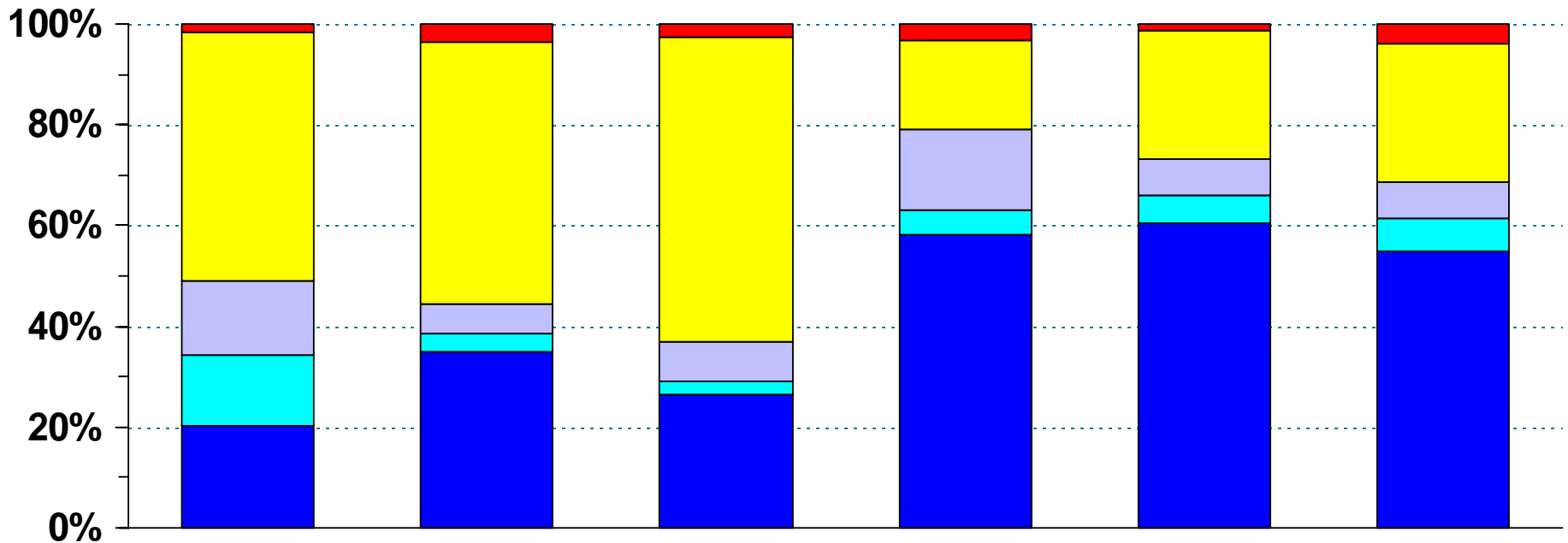
# Career Goal at PhD Completion and Tenured 10-14 Years Later

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

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



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



Biochem.

Comp.  
Sci.

Elec.  
Eng.

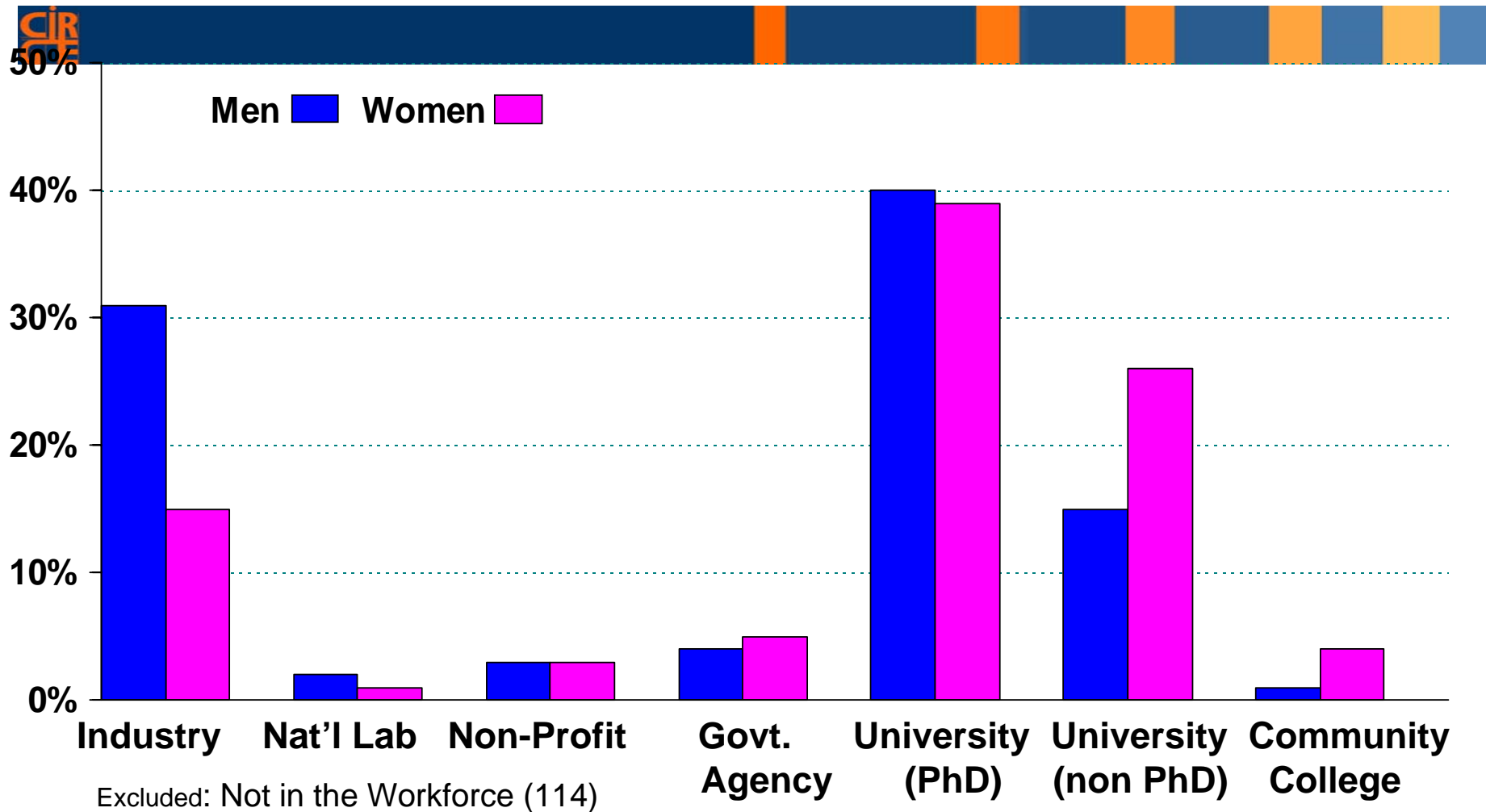
English

Math.

Poli.  
Sci.

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

# Selected Employers 10+ Years Later by Gender





# 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

PRELIMINARY RESULTS

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

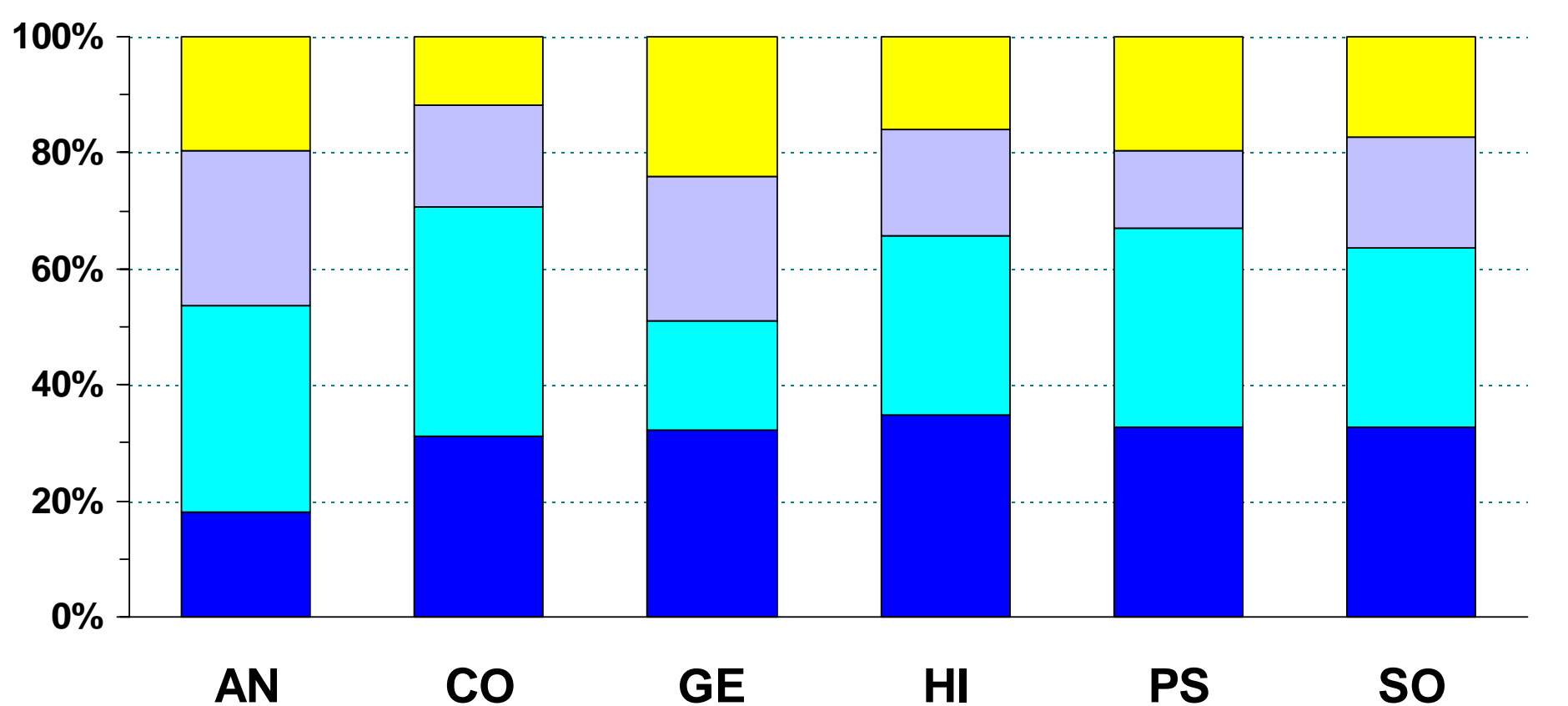


**Tenured**

**Tenure Track**

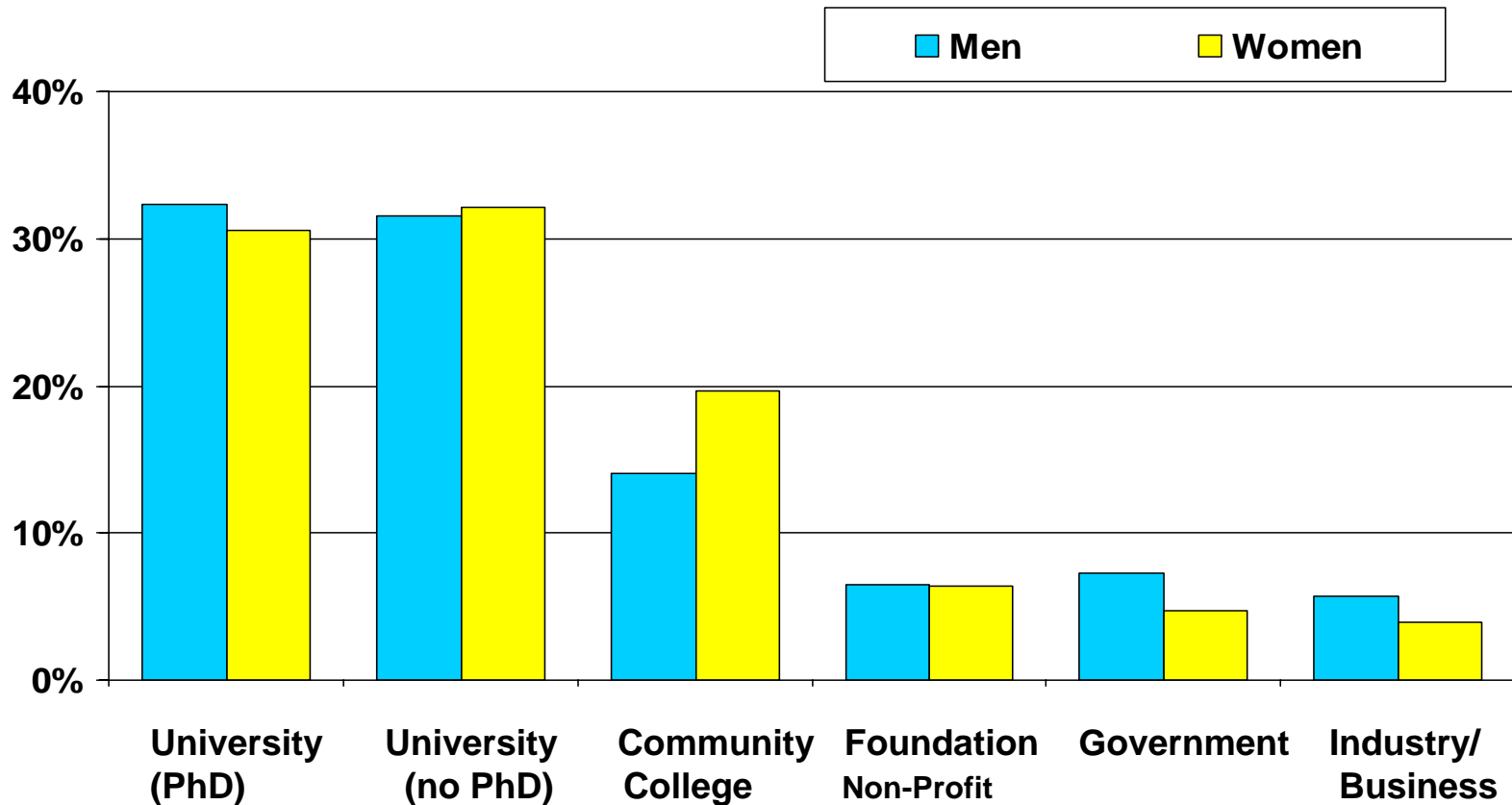
**Acad. Other**

**BGN**



**PRELIMINARY RESULTS**

# Selected Employer at Time of Survey (2005/2006) **Social Science**



**Excluded: Not in the Workforce (55)**

**PRELIMINARY RESULTS**

# Common Assumption 2



**The “best” PhD students do  
become professors**

**measures: short time-to-degree  
many publications**

# Common Assumption 2

## The “best” become professors



Short time-to-doctoral degree and number of publications only mattered significantly for **English** and **political science PhDs**.

These factors did NOT matter for **biochemists, electrical engineerings,** and **mathematicians**. Time-to-degree mattered for computer scientists (logistic regression analysis).

# Common Assumptions the “best” and mentoring



What mattered most is the **RANK** of PhD-granting program.  
However in fields with an **attractive job market outside academia, computer science and electrical engineering, RANK did NOT matter significantly.**

# Common Assumption 3



**PhD recipients' career paths  
are linear and smooth**

# Three Major Trajectories: Political Science



**Percent  
of Total**

**42%**

## 1. Faculty

TT to Ten. (219)



## 2. BGN Employees

Business (29)

6%

Government (21)

4%

**13%**

Non-Profit (15)

3%

## 3. Crossovers

Acad. to BGN (22)

4%

BGN to Acad. (10)

2%

**12%**

Back and Forth (30)

6%

Trajectory 1: Under 2yrs. BGN.

Trajectory 2: Under 1yr. Acad.

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



# Common Assumption 4



**Everybody can take the best  
job offered**

# 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



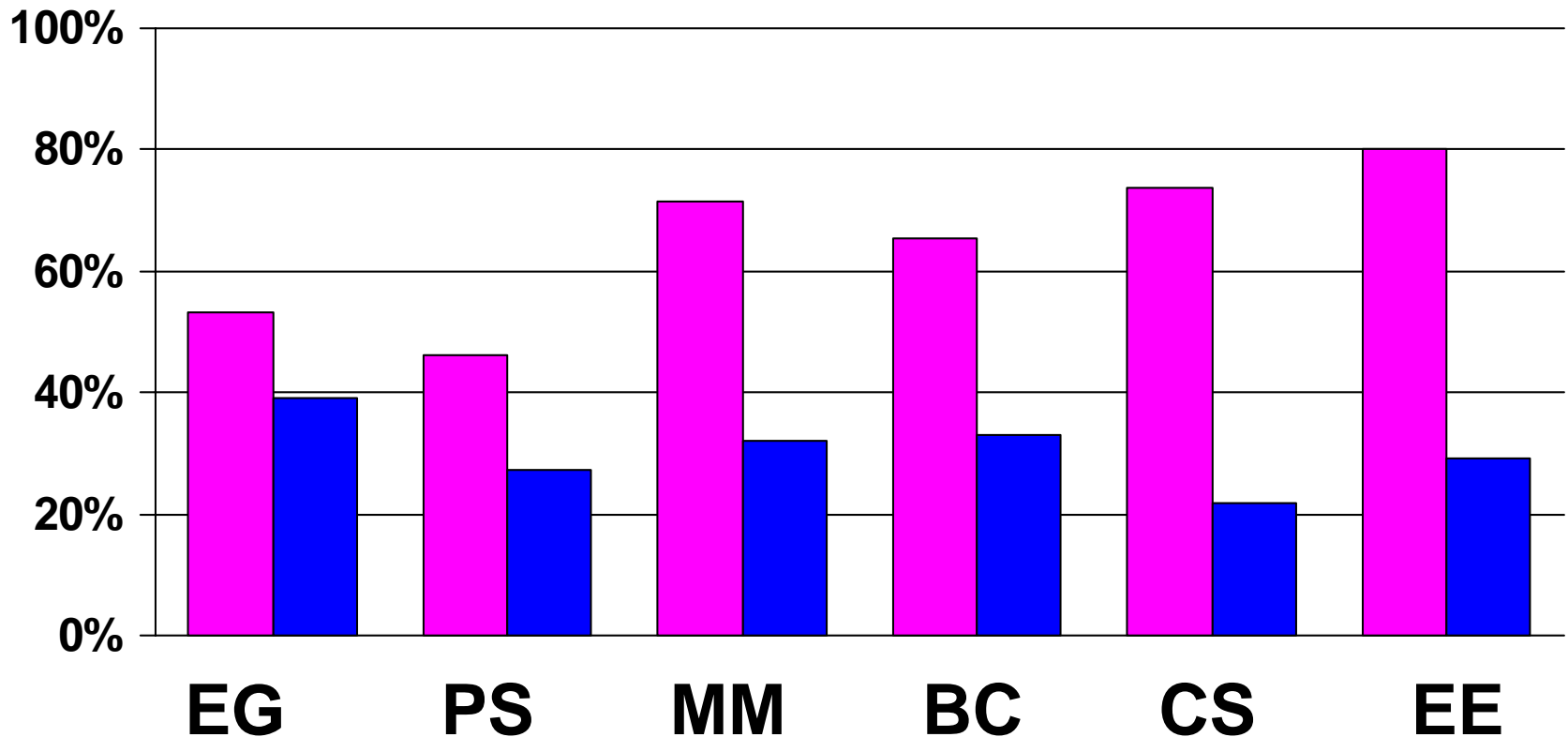
AT PhD completion married **women/ men**  
BIOCHEMISTS had spouses with PhD/JD/MD  
(1997): **75% / 24%**

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

CIRGE

Married Women Married Men



# Who Influenced the Career Path?

## *Art History*



	Women	Men
<b>Partner</b>	<b>44%</b>	<b>26%</b>
<b>Children</b>	<b>38%</b>	<b>13%</b>
<b>Taking Care of Relatives</b>	<b>13%</b>	<b>4%</b>

# Common Assumption 5



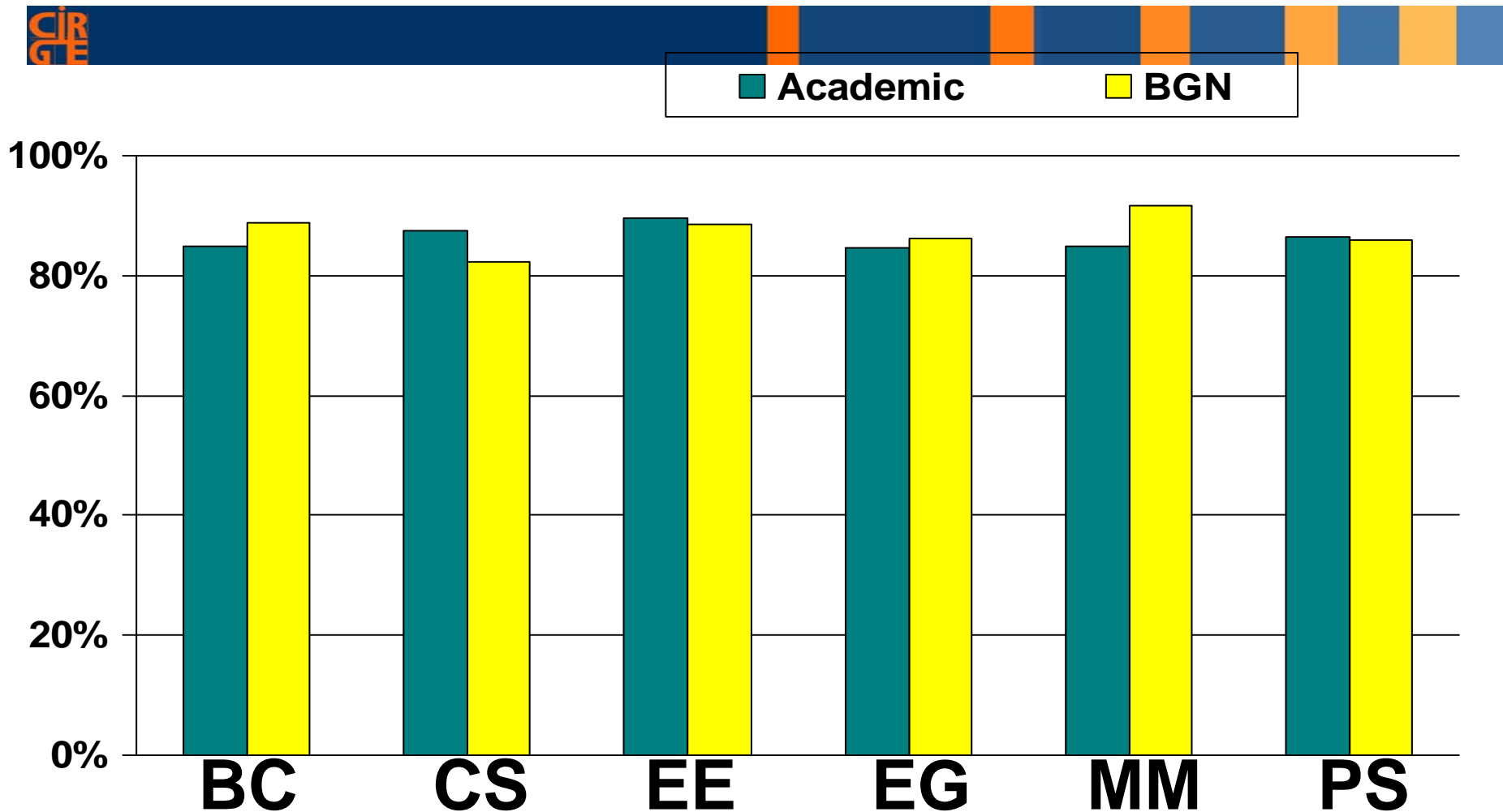
**Faculty enjoy the highest job satisfaction**

# % Very Satisfied in Job at Time of Survey (*All Fields*)



	Rank	%	N
<b>BNG manager/executive</b>	<b>1</b>	<b>40%</b>	<b>243</b>
<b>Academic administrator</b>	<b>2</b>	<b>39%</b>	<b>54</b>
<b>Acad. researcher</b>	<b>3</b>	<b>28%</b>	<b>54</b>
<b>Tenured Professors</b>	<b>4</b>	<b>26%</b>	<b>851</b>
<b>BNG researcher</b>	<b>5</b>	<b>24%</b>	<b>430</b>
<b>Administrators</b>	<b>6</b>	<b>22%</b>	<b>54</b>
<b>Temporary academic staff, lecturer,</b>	<b>7</b>	<b>18%</b>	<b>131</b>

# Overall Current Job Satisfaction\* by Sector



\*Satisfaction = "Very Satisfied" + "Fairly Satisfied"

Source: CIRGE, University of Washington: AGS, "Defining Successful Careers," Florence 7-8-2005

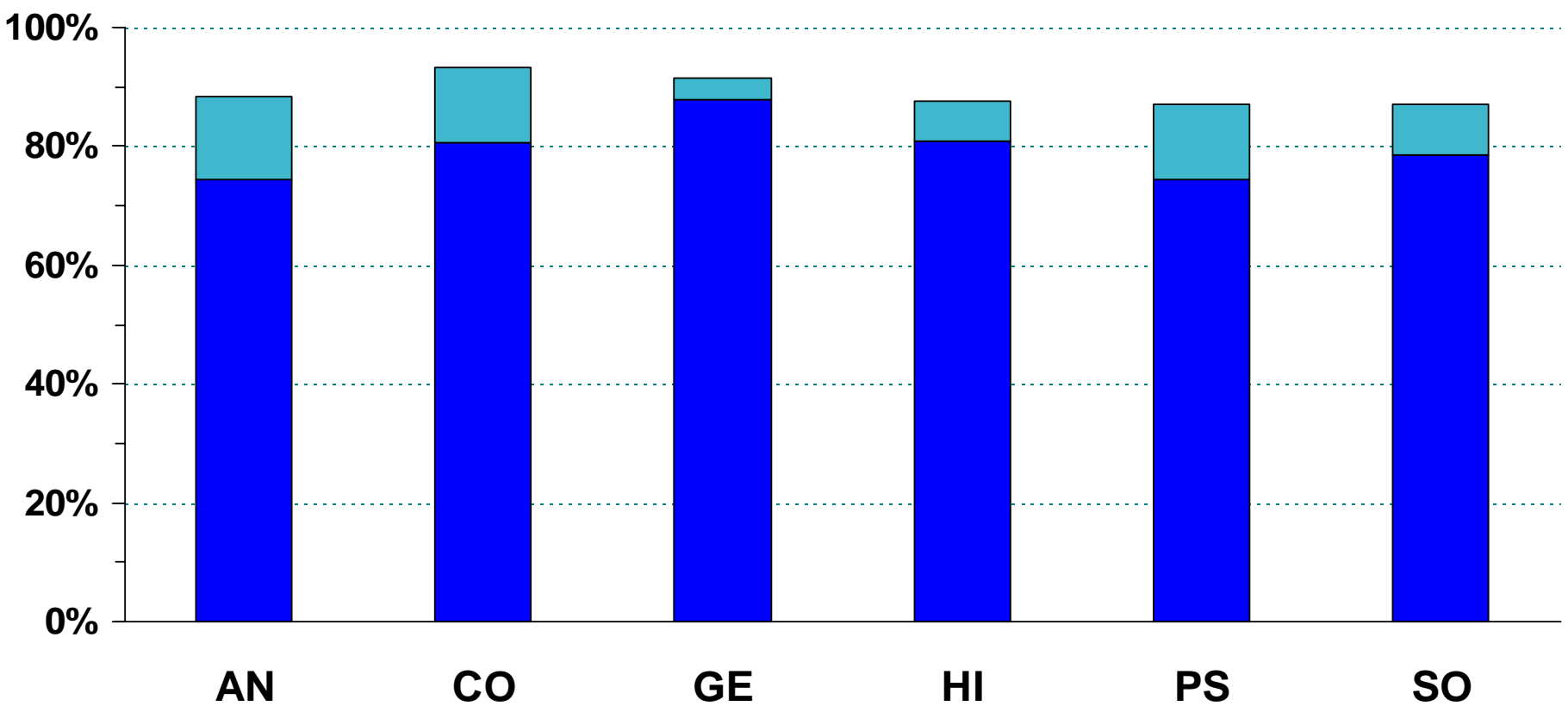


# Would You Do the PhD Again in Same Field or Different Field?



■ Yes, Same Field

■ Yes, Different Field



**PRELIMINARY RESULTS**

Source: CIRGE, University of Washington: AGS, "Defining Successful Careers," Florence 7-8-2005

# What are criteria for measuring program effectiveness?



## Traditional Criteria

1. % national fellowship holders
2. Recruitment of diverse student body
3. Reasonable Time to degree
4. Low attrition rate
5. Student satisfaction
6. Placement

# Further Measurement criteria



- 1. Job search experience**
- 2. Current job satisfaction**
- 3. Retrospective analyses of the quality of the doctoral education**
- 4. PhD recipients' opinions of the usefulness of their doctoral education**
- 5. Recommendations for current students and current programs.**

# Thank you!



CIRGE website

[www.cirge.washington.edu](http://www.cirge.washington.edu)