

What is in it for me? The benefits of diversity in scientific communities



DR. CARLA FEHR
IOWA STATE UNIVERSITY
CFEHR@IASTATE.EDU

Thank you to:



- **You**
- **Drs. Sharon Bird, Sandy Gahn, Jason Pontius and Heidi Grasswick**
- **NSF**
 - This material is based upon work supported by the National Science Foundation under Grant No. SBE 06003999. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author and do not necessarily reflect the views of the National Science Foundation.

What is in it for me? The benefits of diversity in scientific communities



DR. CARLA FEHR
IOWA STATE UNIVERSITY
CFEHR@IASTATE.EDU

Where are the women?



- **Increases of women students have not lead to proportional increases of women professors**
- **Attrition rates are higher among women than men professors**
- **Women faculty members tend to be concentrated in less prestigious institutions, at lower ranks and in less secure positions**

Possible answers to “What is in it for me?”



- **Justice**
- **Global competitiveness**
- **Improved teaching and student service**
- **Diversity promotes excellent science and engineering**

Diversity promotes excellence



- **Increasing the representation of women in STEM is good for research.**
- **Science is done by groups**
- **Diverse groups are better at:**
 - Discovering their own biases
 - Discovering the hidden assumptions in their research
 - Creating rigorous experimental designs
- **Because:**
 - We notice our biases and assumptions when we interact with people who hold different biases and assumptions

Diversity promotes excellence



- **Diversity promotes excellence requires:**
 - **Diversity**--include a wide range of people in our groups or communities
 - **Effective critical social interactions**—the members of the group engage in productive dialogue regarding research.

Diversity promotes excellence



“Effective critical interactions transform the subjective into the objective, not by canonizing one subjectivity over others, but by assuring that what is ratified as knowledge has survived criticism from multiple points of view.”

Helen Longino 2002, 129

Diversity promotes excellence: Patricia Gowaty

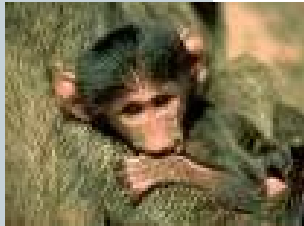


“Feminism made the experimental designs better. Being self-conscious about my politics has made my experiments better than they might otherwise be, because I institute a variety of controls that others might also use, and would no doubt use, if they were more aware of their own biases (Gowaty 2003).”

Diversity promotes excellence: Jeanne Altmann



Jeanne Altmann



OBSERVATIONAL STUDY OF BEHAVIOR: SAMPLING METHODS

by

JEANNE ALTMANN¹⁾

(Allee Laboratory of Animal Behavior, University of Chicago,
Chicago, Illinois, U.S.A.)

(Rec. 15-III-1973)

CONTENTS

	Page
Introduction	227
Sampling variables	231
<i>Ad libitum</i> sampling	235
Sociometric matrix completion	240
Focal-animal sampling	242
Sampling all occurrences of some behaviors	247
Sequence sampling	248
VIII. One-zero sampling	251
IX. Instantaneous and scan sampling	258
Summary	261
Bibliography	262
Zusammenfassung	265

I. INTRODUCTION

This is an observer's guide: in it I will present sampling methods for use in direct observation of spontaneous social behavior in groups of men or other animals. All observational sampling methods known to me will be described, and their uses and limitations indicated.

A. SCOPE

I shall assume that the observer has a group of spontaneously acting individuals to watch, that he has formulated one or more hypotheses about social behavior, that he knows what behaviors he wishes to observe, and that he has found suitable methods for recording such behaviors.

In the preparation of this paper the author was supported by research grants from the National Science Foundation, and MH-19,617, from the Public Health Service. The encouragement and criticisms of my husband, Stuart ALTMANN, and the value at all stages of the research and writing. The manuscript benefitted from the reading of an earlier version by Joel COHEN, Glenn HAUSFATER, James LOY, and Montgomery SLATKIN, Thomas STRUHSACKER and Stephen WAGNER.



Social science research on barriers to effective critical social interactions



- **Barriers to women getting uptake**
- **Barriers to social interactions**
- **Barriers to women developing alternative views**

Barriers to uptake-vita studies



- CV's with female names were coded as assistant professors, with male names as associate professors (Fidel 1975).
- CV's with female names were less likely to be judged as employable than CV's with male names.
 - Women's CV's had 4 times as many cautionary notes written in the margins. (Steinpreis et al 1999).

Barriers to uptake—letters of recommendation



In successful letters of recommendation for medical school faculty, women were:

- Twice as likely to receive a “letter of minimal assurance” with no specifics.
- Twice as likely to have a “doubt raiser” in the text.
- Half as likely to be called “successful.”
- 4 times less likely to have the words “accomplishment” or “achievement” mentioned.
- 1.5 times more likely to have “grindstone” adjectives.

Trix, F. & Psenka, C. 2003.

Barriers to uptake—quantitative and qualitative data on women in physics



“It is difficult when you are, as I have been, the only woman in a conference. Or when people interrupt, or do not listen or even laugh at what you are saying, even if it is important. Or when advisors or mentors could not believe that I’d done the work myself.”

Ivie and Guo 2006, 11

Barriers to uptake



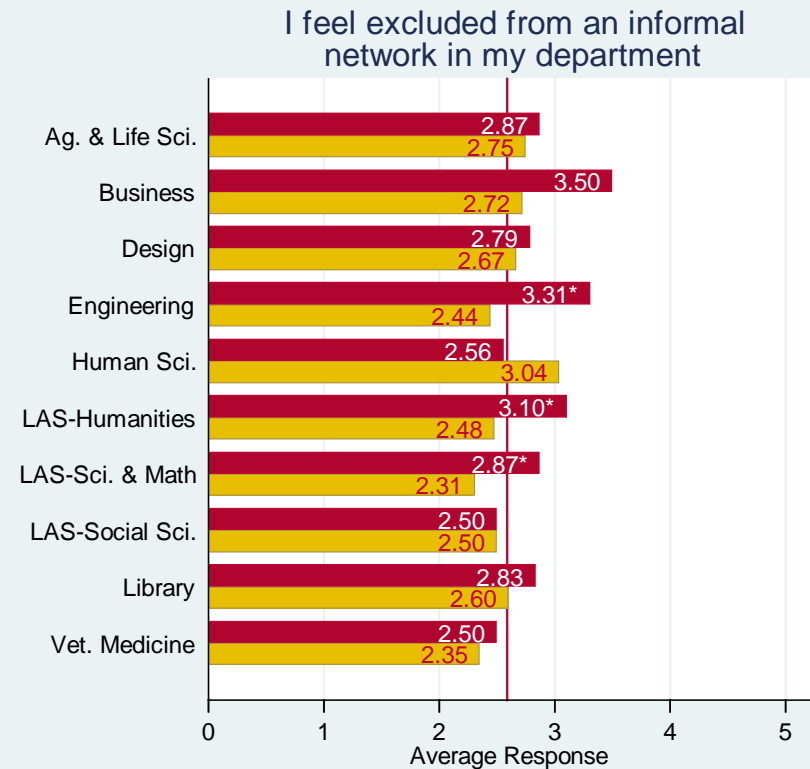
- **Wasted diversity**
- **Implicit bias: both men and women tend to underestimate women's professional accomplishments**

Barriers to social interactions: isolation



- “The biggest challenge that women face in planning a career in science is not being taken seriously. Often women have to go farther, work harder and accomplish more in order to be recognized” (Rosser 2004, 40).
- “The main reason [I’ve felt discouraged] is so often you are just made to feel like you shouldn’t be there. You have to work twice as hard, do twice as much just to be considered half as qualified” (Ivie and Guo 2006, 11).

Barriers to social interactions: isolation



Scale: 1 = Strongly disagree, 5 = Strongly agree
Red line = mean response for all faculty
Source: Iowa State University Institutional Research
(2008 AAUDE Faculty Satisfaction Survey)

Jason Pontius & Sandra Gahn, Iowa State University 2008 Faculty Satisfaction Survey

Barriers to social interactions: collaboration



- **“Women were more often treated as subordinates rather than equal or senior research partners.”
Sonnert and Holton 1996**
- **“Interaction with colleagues has been the most difficult. I have often felt that I am ignored or discounted when I attempt to initiate collaborations with men.”
Ivie and Guo 2006, 11**

Barriers to social interactions



“Within the same type of setting, women scientists can have fewer and different collaborative arrangements, claims to enabling administrative favors, *collegial opportunities for testing and developing ideas*, and entrees into the informal culture of science and scholarship”

(Fox 1991, 204 in Rosser 2004, 47 italics added).

Barriers to women developing alternative views



- 34.8 percent of women and 9.9 percent of men thought their gender plays a role in their methods.
- But,
 - “Rather than being iconoclasts, women tended to uphold to a particularly high degree the traditional methodological standards of science, such as carefulness, replicability and connection to fundamentals. As a group, women, as relative newcomers to science, adopted - or were taught to adhere to - an extra-high measure of conformity to the formal norms of conducting research” (Sonnert and Holton 1996, 8-9).

Social science research on barriers to effective critical social interactions



- **Barriers to women getting uptake**
- **Barriers to social interactions**
- **Barriers to women developing alternative views.**

Caveats



- **Not all women are negatively impacted by these barriers**
 - Some develop excellent strategies
 - Luck
 - ✦ Institutions with which they are affiliated
 - ✦ Excellent mentoring

Hope



- **Federal support: NSF ADVANCE**
- **Institutional support: This conference**
- **Forewarned is forearmed**
 - Networking
 - Self promotion
 - Role models
 - Mentors
- **Your mere presence means you are better than you, and most other people, think you are.**

Resources



- **Gender Bias Learning Project**
 - <http://www.genderbiasbingo.com/strategies.html>
- **Women, Work and the Academy: Strategies for Responding to 'Post-Civil Rights Era' Gender Discrimination**
 - http://faculty.washington.edu/aw26/WorkplaceEquity/BCRW-WomenWorkAcademy_08.pdf
- **Advance Portal**
 - <http://www.portal.advance.vt.edu/>
- **Beyond Bias and Barriers: Fulfilling the Potential of Women in Academic Science and Engineering**
 - http://www.nap.edu/catalog.php?record_id=11741

What is in it for me? The benefits of diversity in scientific communities



CARLA FEHR
IOWA STATE UNIVERSITY
CFEHR@IASTATE.EDU