



How women and men scientists solve problems and interact when conducting experiments

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Overview



- The issues of women in science
- Investigations of women & men scientists reasoning live
- Stereotypes: Investigation of women and men dyads interacting (Jasinska, Petitto & Dunbar in prep)
- Implications for teams, training & Science

RECENT HISTORY OF GENDER & SCIENCE

- Harvard's President Summers
- January 2005 Harvard University President Lawrence Summers made his now-infamous remarks speculating that female scientists may have difficulty winning tenured faculty positions because of differences in “intrinsic aptitude.”

Use InVivo method



- Look at women and men reasoning in their natural setting
 - We can then ask questions about women and men in science
- Interactions
 - How women are treated
 - How women treat others in the lab
- Reasoning
 - Do women reason differently?

Gender Analyses

Analological Reasoning

- No differences

Social interactions

- No differences
- Women no less likely to challenge

Unexpected findings

- Men more likely to assume know the cause
- Women more likely to determine cause



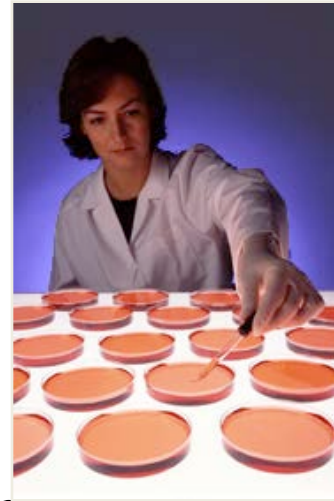
How Frequent is the Unexpected?

In 12 meetings

- 421 findings

Range of unexpected findings per meeting

- 30% - 70%



UNEXPECTED IS COMMON

Gender & Unexpected Findings

In One Lab, over 100 unexpected findings

	Unknown	Method	Mistake	New Hyp
Women	38%	38%	10%	14%
Men	73%	22%	5%	0%

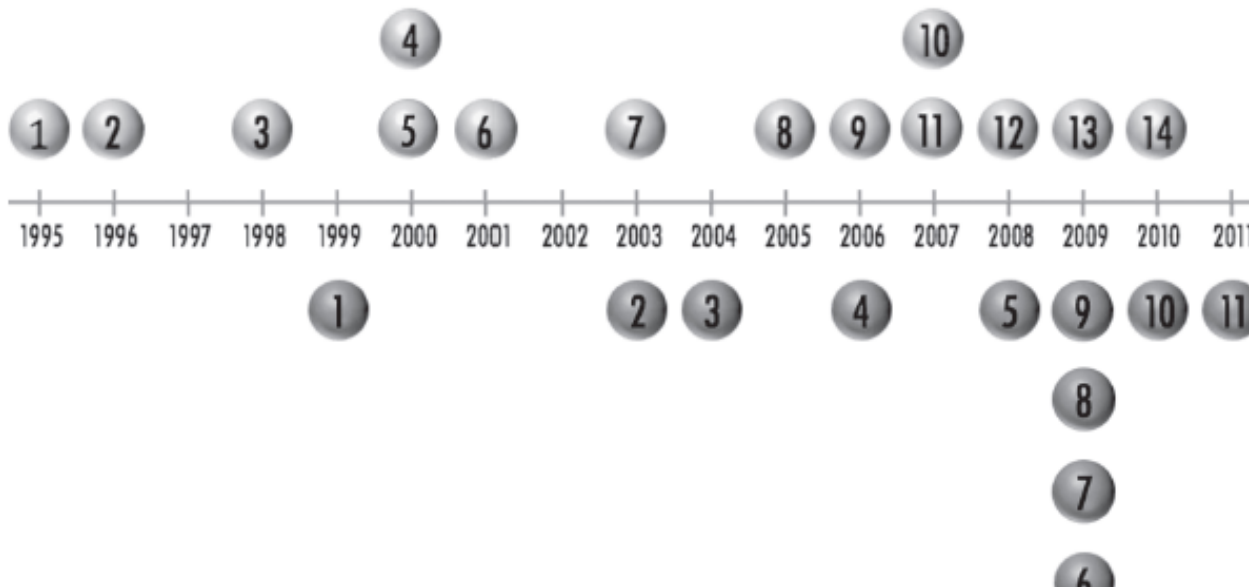
	Replicate	Analyze	New Method	Abandon	Continue
Women	15%	40%	26%	19%	0%
Men	0%	27%	50%	14%	9%

Undergraduate Science Labs

- Many students drop out of science after taking lab courses
- Proportionally more women.
- Why, important question.
- Leaky pipeline
- We are investigating the interactions of woman and men in undergraduate biology labs

Kaiser 2011

fMRI Language Studies on *Sex/Gender* from 1995 to 2011



● differences

- 1 : Schaywitz et al.
- 2 : Pugh et al.
- 3 : Schlösser et al.
- 4 : Gur et al.
- 5 : Kansaku et al.
- 6 : Phillips et al.
- 7 : Baxter et al.
- 8 : Kocak et al.
- 9 : Clements et al.
- 10 : Cosgrove et al.
- 11 : Chen et al.
- 12 : Dong et al.
- 13 : Gauthier et al.
- 14 : Brita et al.

● no differences

- 1 : Frost et al.
- 2 : Weiss et al.
- 3 : Sommer et al.
- 4 : Plante et al.
- 5 : Harrington et al.
- 6 : Garn et al.
- 7 : Chiarello et al.
- 8 : Ihmen et al.
- 9 : ...

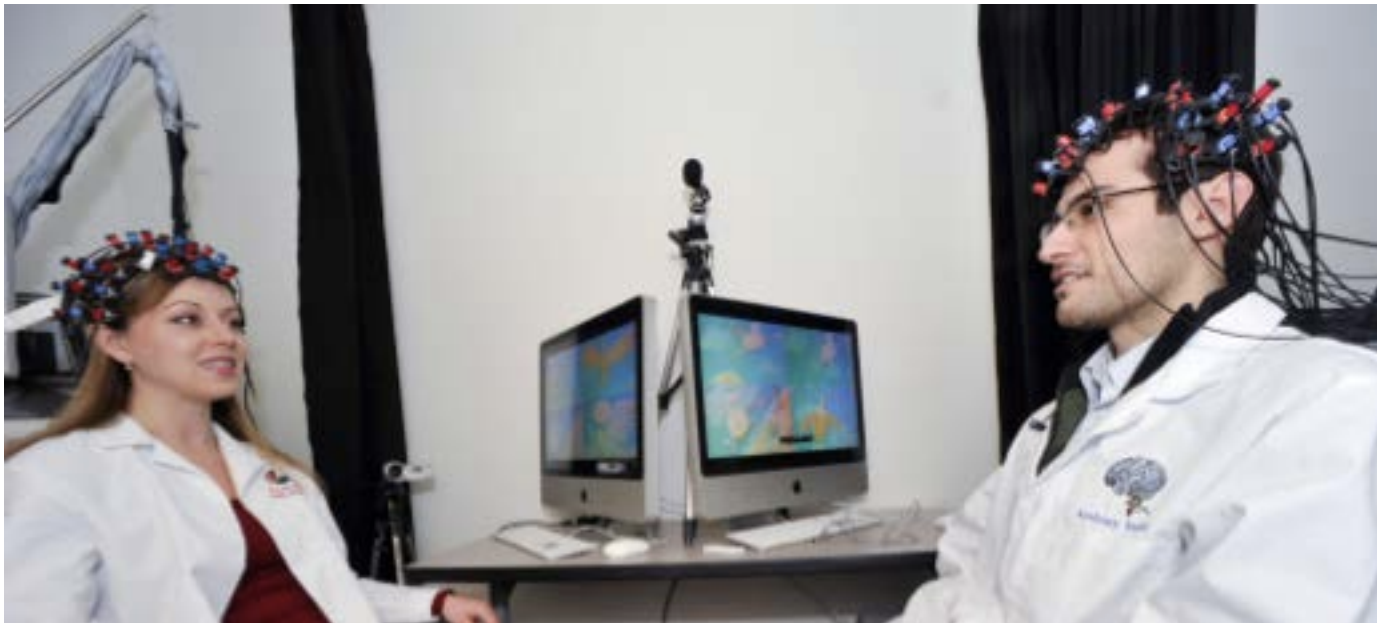
Stereotypical Neuroimaging views

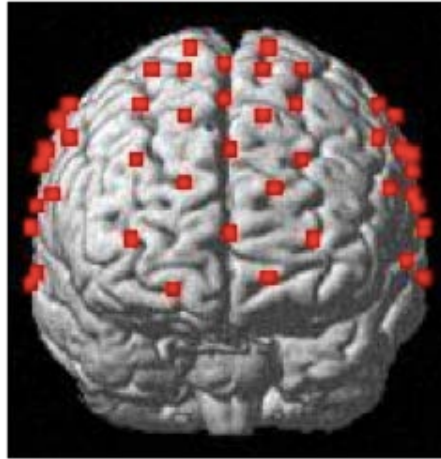


BRAIN ACTIVATION PATTERNS during reading, as revealed in these functional magnetic resonance images, differ in men and women. During phonological processing, men show primarily unilateral activation, in the left inferior frontal gyrus. In women, phonological processing activates both the left and the right inferior frontal gyri.

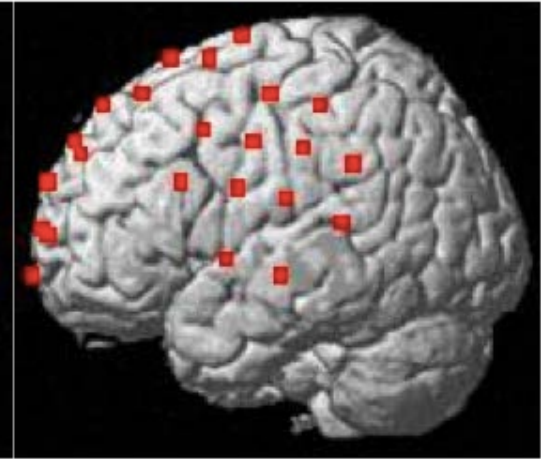
Are there gender related neural activation differences?

fNIRS studies of same and mixed gender pairs Jasinska et al 2011, & in prep



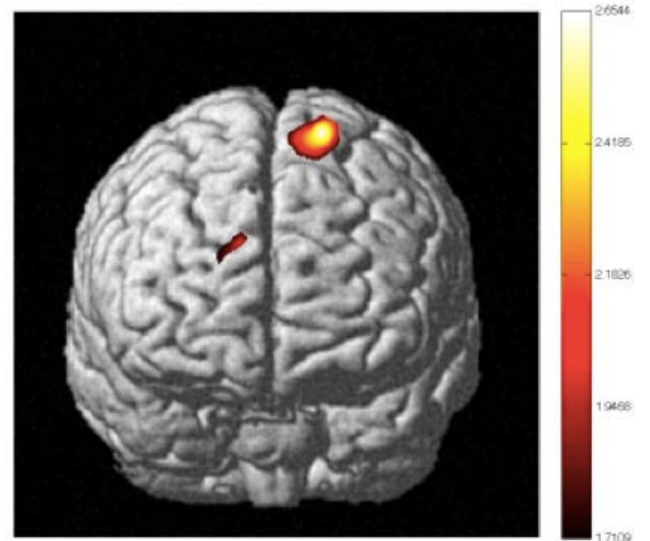


Frontal
Placement



Lateral
Placement

Jasinska et al., 2011 & in preparation

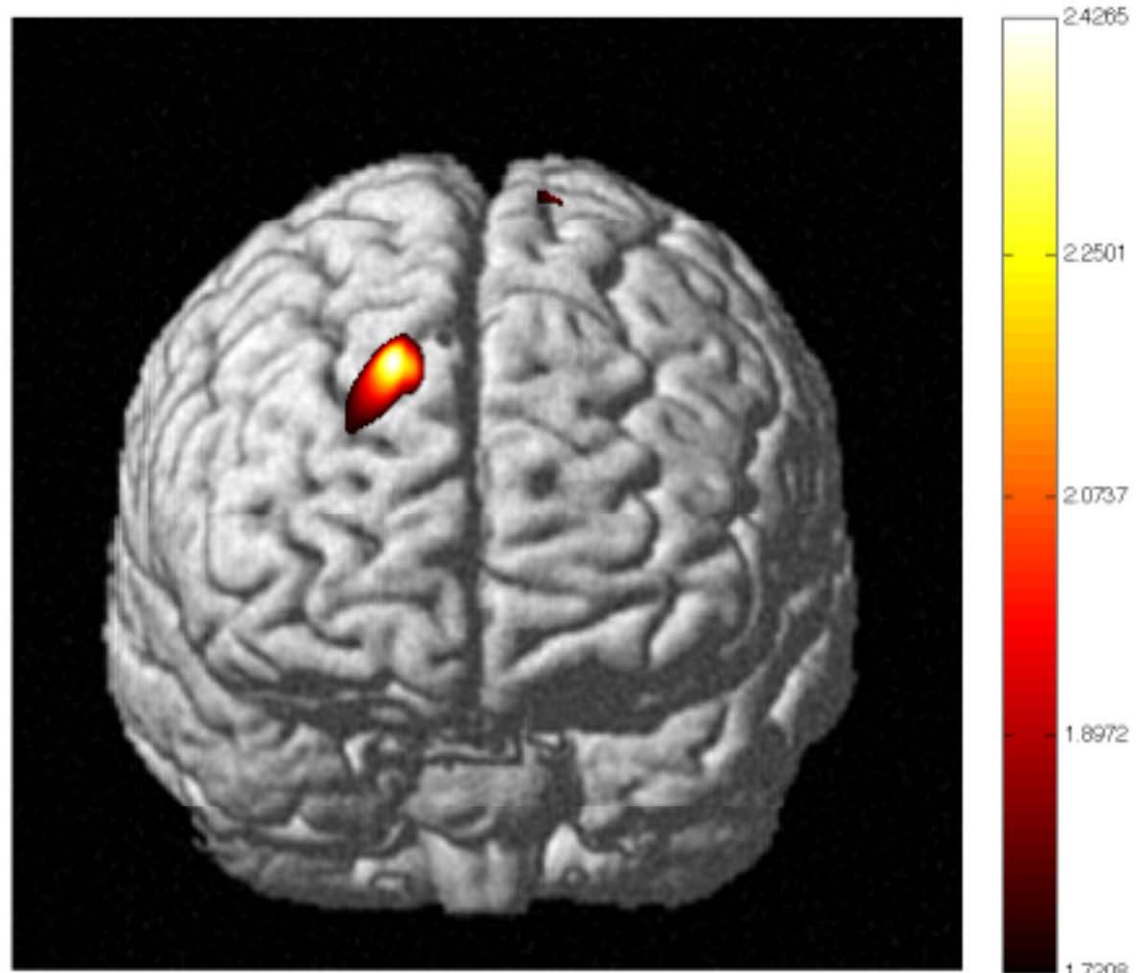


Results

- No overall behavioral or neural differences were found between men and women as they conversed to construct a story
- Different neural activation patterns were observed between same-gender and mixed-gender pairs
 - **Context rather than gender differences determines brain activation patterns**

Story Construction

Women in MF pairs > Women in FF pairs



Summary of Gender

- Overall issues
- Hypotheses concerning gender differences
 - Real scientists at work: No Difference
 - The science museum
- Our Recent neuroimaging work
 - (Jasinska et al. no gender rather context diffs
- How to fix?
- Labs with critical mass more discoveries

Summary

- Overall issues
- Hypotheses concerning gender differences
 - Real scientists: No differences
 - The science museum: No differences
 - Neuroimaging: Context most important
- Results not consistent with popular stereotypes. Need to change the Stereotypes