
Debating sex differences in cognition: we can do better

What I learnt teaching Cordelia Fine's
“Delusions of Gender”

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University of Sheffield

The graduate class

PSY6316 'Current Issues in Cognitive Neuroscience'.

MSc course, ~15 people.



**CORDELIA
FINE**

The Real Science
Behind Sex Differences

**DELUSIONS
OF GENDER**

Shortlisted for the John Llewellyn Rhys Prize

'If you believe that the tide of
blue and pink that greets
children in a toy or children's
clothes shop is just about colours
... think again.' workingmums.co.uk

'A brilliant feminist critic of the neurosciences
... Read her, enjoy and learn' **Hilary Rose, *THES***

“There *are* sex differences in the brain”
Fine (Delusions, Introduction, p xxvii)

**“Anti-sex difference”
investigators?**

Cahill (2014)

Tuesday, April 01, 2014

Equal ≠ The Same: Sex Differences in the Human Brain

By: Larry Cahill, Ph.D.

Editor's Note: While advances in brain imaging confirm that men and women think in their own way and that their brains are different, the biomedical community mainly uses male animals as testing subjects with the assumption that sex differences in the brain hardly matter. This month's Cerebrum highlights some of the thinking and research that invalidates that assumption.

http://www.dana.org/Cerebrum/2014/Equal_%E2%89%A0_The_Same__Sex_Differences_in_the_Human_Brain/

WHY EVOLUTION IS TRUE

« Ladies and gentlemen, we have President Trump

Friday squirrel feeding »

Are male and female brains absolutely identical?

The *Guardian* has a review out of Cordelia Fine's new book, *Testosterone Rex: Myths of Sex, Science, and Society*, which continues her critique of innate differences between male and female brains and behaviors. The *Amazon* summary includes this:

Testosterone Rex by Cordelia Fine review - men's and women's brains are not different

The psychologist provides more evidence that the inequality of the sexes in
society is cultural not natural

Sarah Ditum, The Guardian, 18th January 2017

Not what Fine thinks. **Not** what Ditum thinks. Headline chosen by subeditor

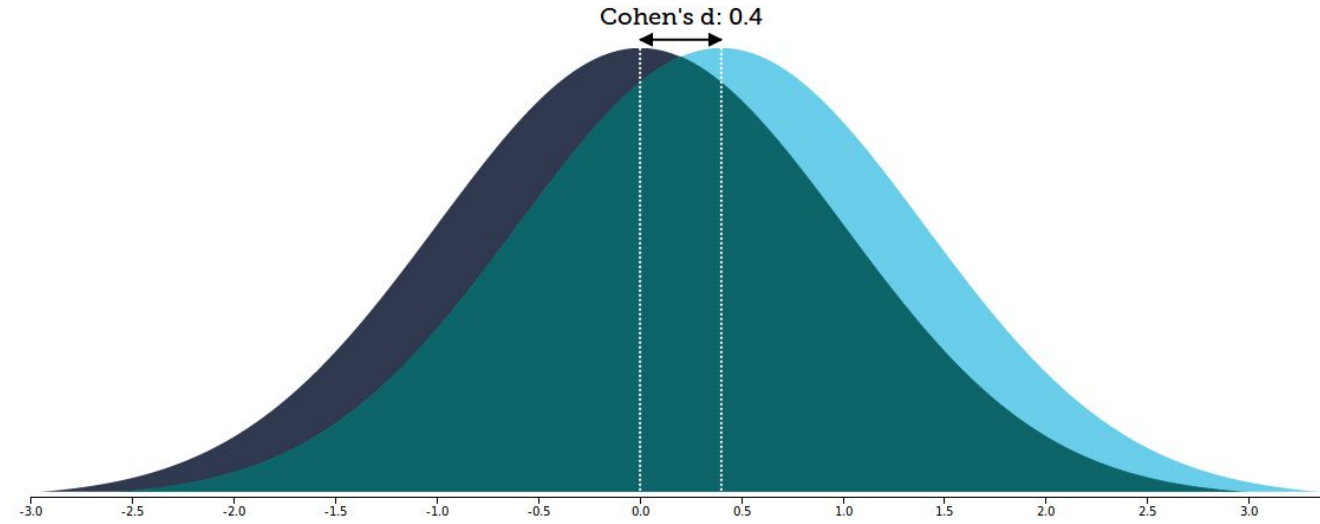
Original:

<http://web.archive.org/web/20170118081437/www.theguardian.com/books/2017/jan/18/testosterone-rex-review-cordelia-fine>

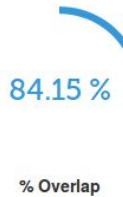
Current: <https://www.theguardian.com/books/2017/jan/18/testosterone-rex-review-cordelia-fine>

We can do better

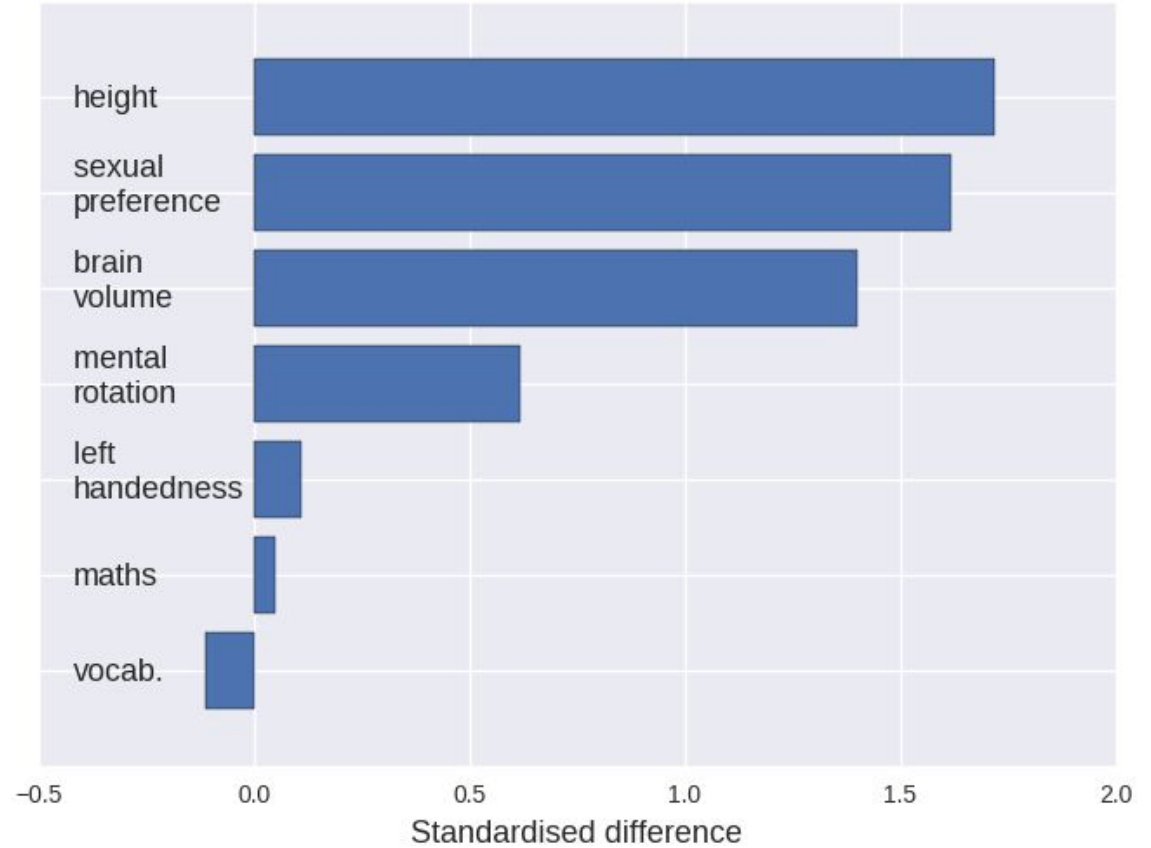
We can quantify the size of differences



Interpretation



Interpreting Cohen's d effect size an interactive visualization by Kristoffer Magnusson
<http://rpsychologist.com/d3/cohend/>



Sex differences in cognition are small

<https://mindhacks.com/2017/02/14/sex-differences-in-cognition-are-small/>

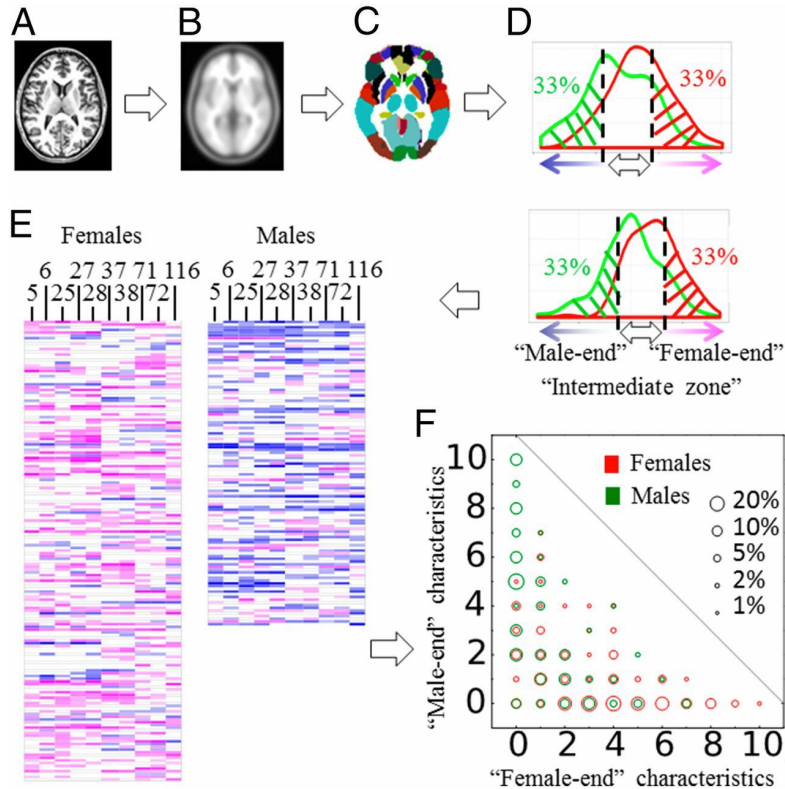
The Gender similarities hypothesis

“The differences model, which argues that males and females are vastly different psychologically, dominates the popular media. Here, the author advances a very different view, the gender similarities hypothesis, which holds that males and females are similar on most, but not all, psychological variables”

Hyde, J. S. (2005). The gender similarities hypothesis. *American psychologist*, 60(6), 581-592

Hyde, J. S. (2014). Gender similarities and differences. *Annual review of psychology*, 65, 373-398.

Male and female brains



Joel, D., Berman, Z., Tavor, I., Wexler, N., Gaber, O., Stein, Y., ... & Liem, F. (2015). Sex beyond the genitalia: The human brain mosaic. *Proceedings of the National Academy of Sciences*, 112(50), 15468-15473.

<https://mindhacks.com/2017/02/11/no-male-and-female-brain-types/>

We can recognise the limitations of our intuitions

What feel like our essential desires can be social products

We can talk about causes rather than outcomes

“How it is” is one question, “How it got that way” another

**We can be more
sophisticated about
innateness**

Does innate mean

- evolved / due to natural selection?
- doesn't involve learning, or environmental triggers?
- causally correlated with the action of specific genes?
- over-determined during development ('canalized')?
-and so, 'inevitable'?

(Mameli & Bateson, 2011)

Innateness as a 'folk biological' concept - an incoherent
essentialism

(Griffiths, Machery & Linquist, 2009)

Mameli, M., & Bateson, P. (2011). An evaluation of the concept of innateness. *Philosophical Transactions of the Royal Society of London B: Biological Sciences*, 366(1563), 436-443.

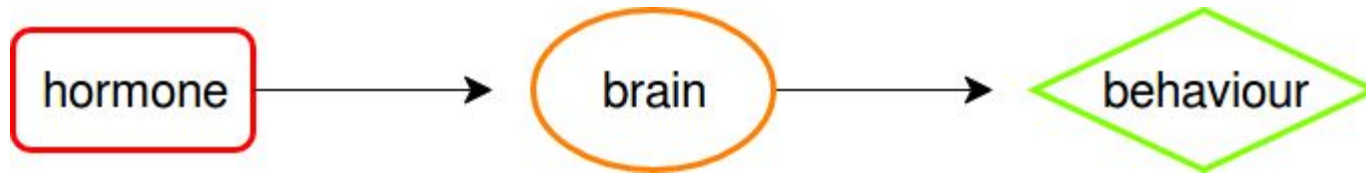
<http://rstb.royalsocietypublishing.org/content/366/1563/436.short>

Griffiths, P., Machery, E., & Linquist, S. (2009). The vernacular concept of innateness. *Mind & Language*, 24(5), 605-630.

http://philsci-archive.pitt.edu/4245/1/Griffiths%2C_Machery_%26_Linquist_In_Press.pdf

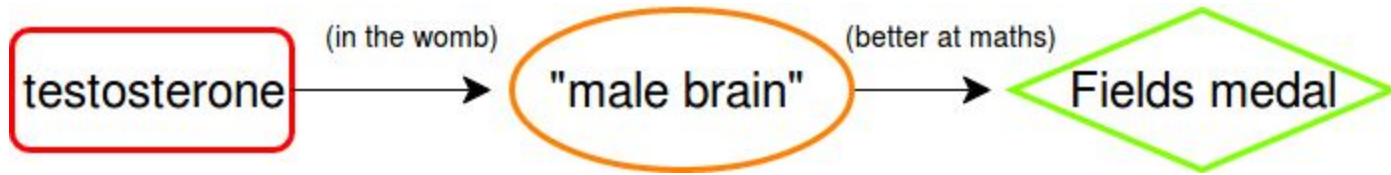
Let's talk neurodevelopmental endocrinology!

Model system: spinal nucleus of the bulbocavernosus (SNB)



hormones, brain and behaviour, a not-so-simple story

<https://mindhacks.com/2017/02/28/hormones-brain-and-behaviour-a-not-so-simple-story/>



hormones, brain and behaviour, a not-so-simple story

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testosterone

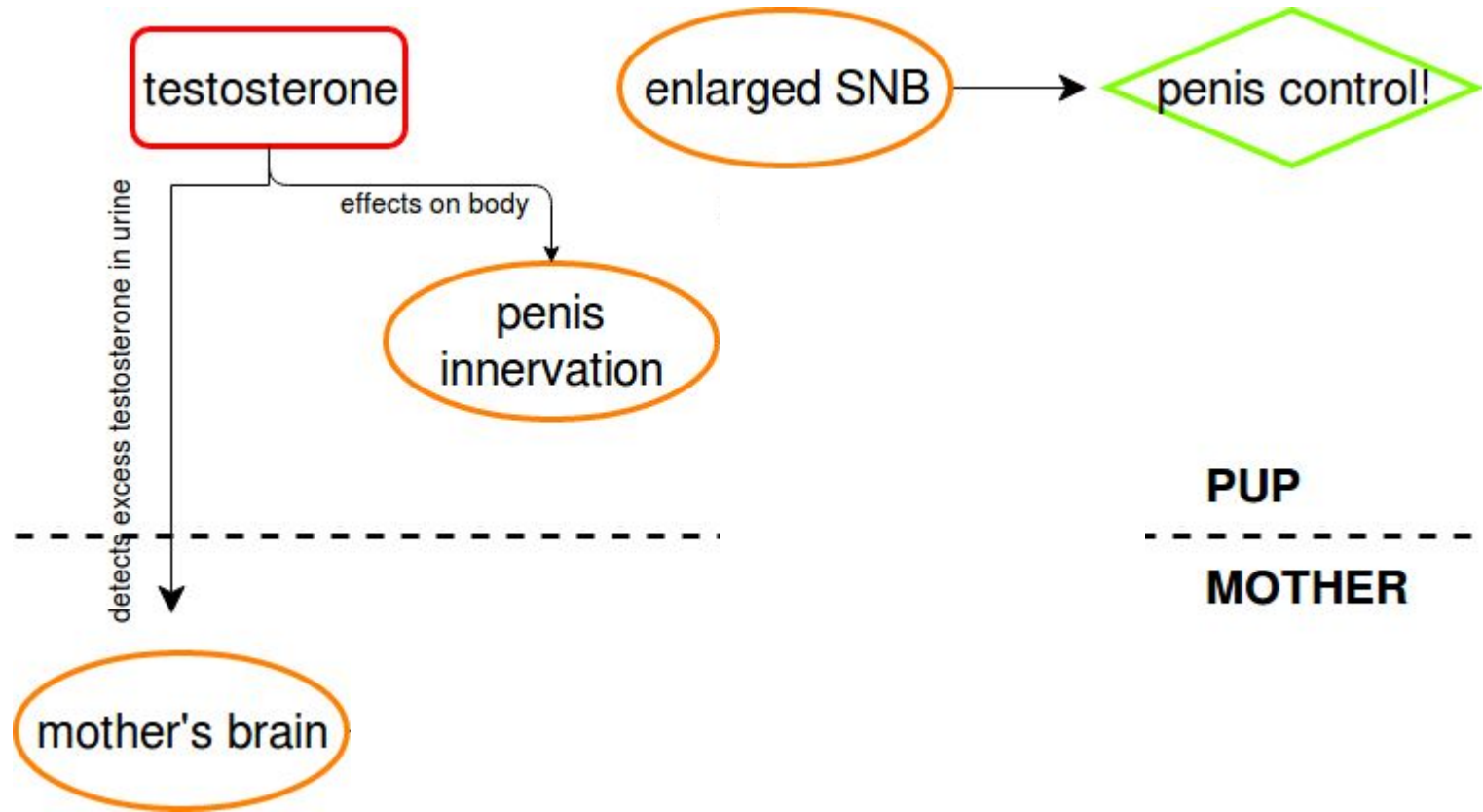
enlarged SNB



penis control!

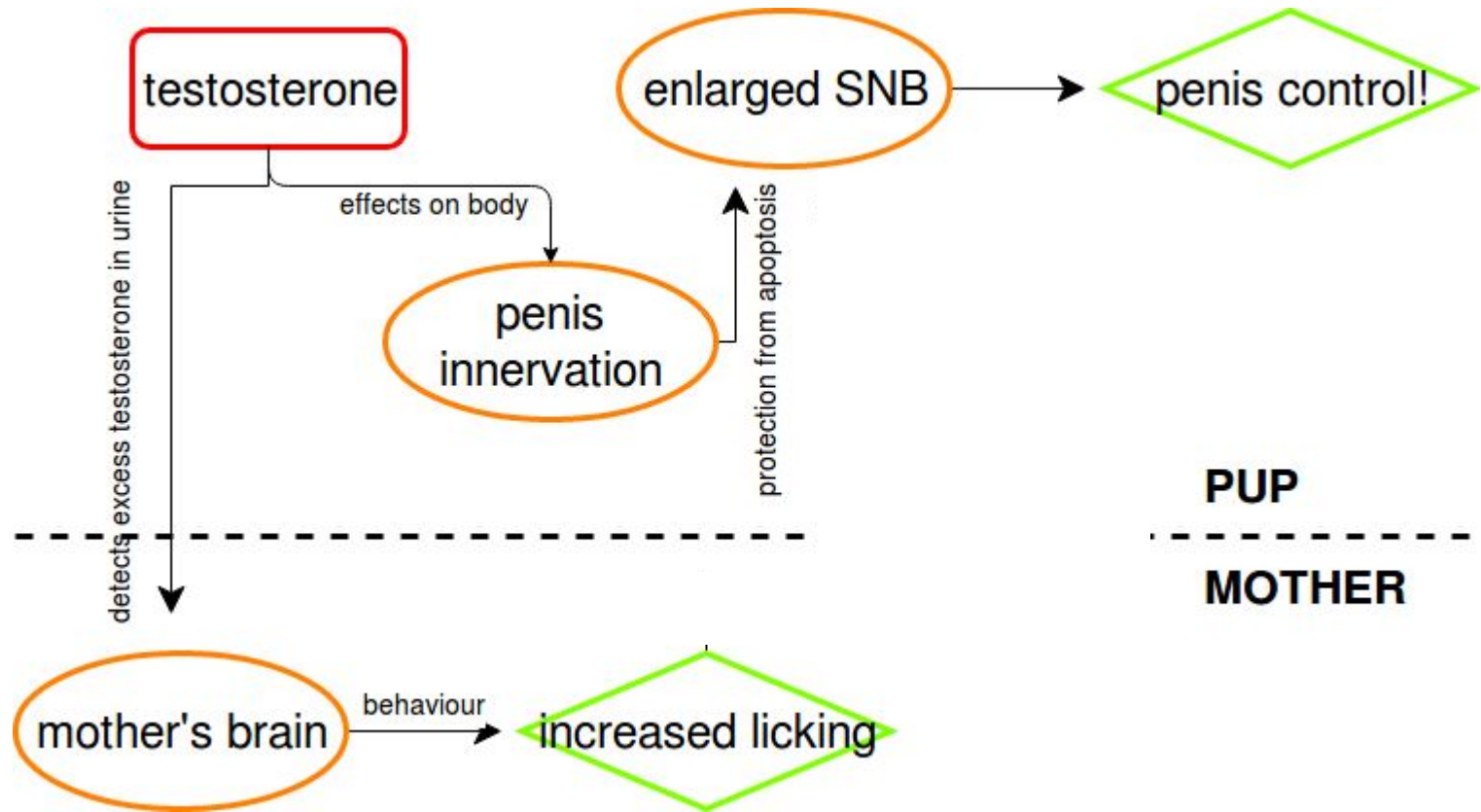
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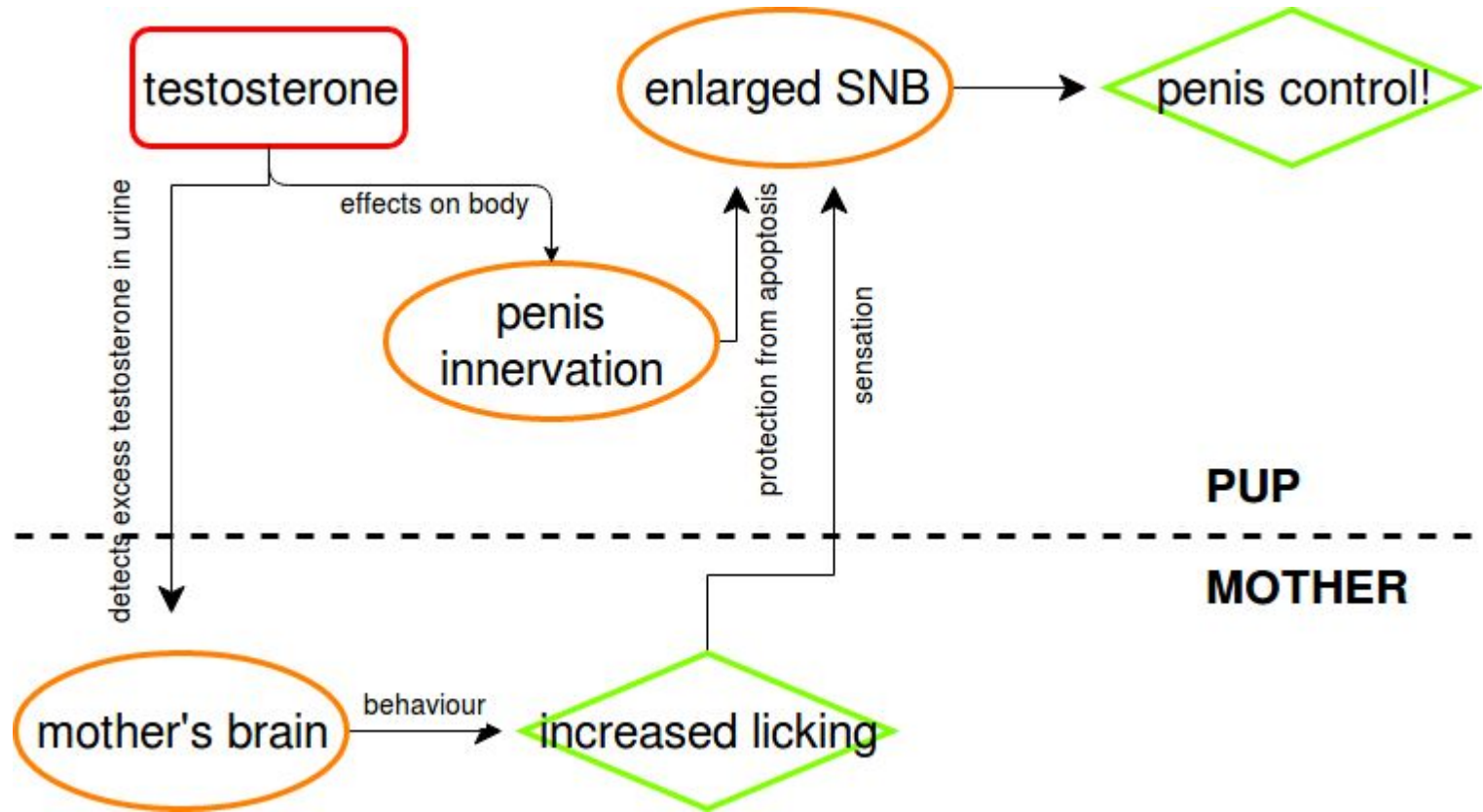
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“Biology as fallback position”

Two plausible general schemes:

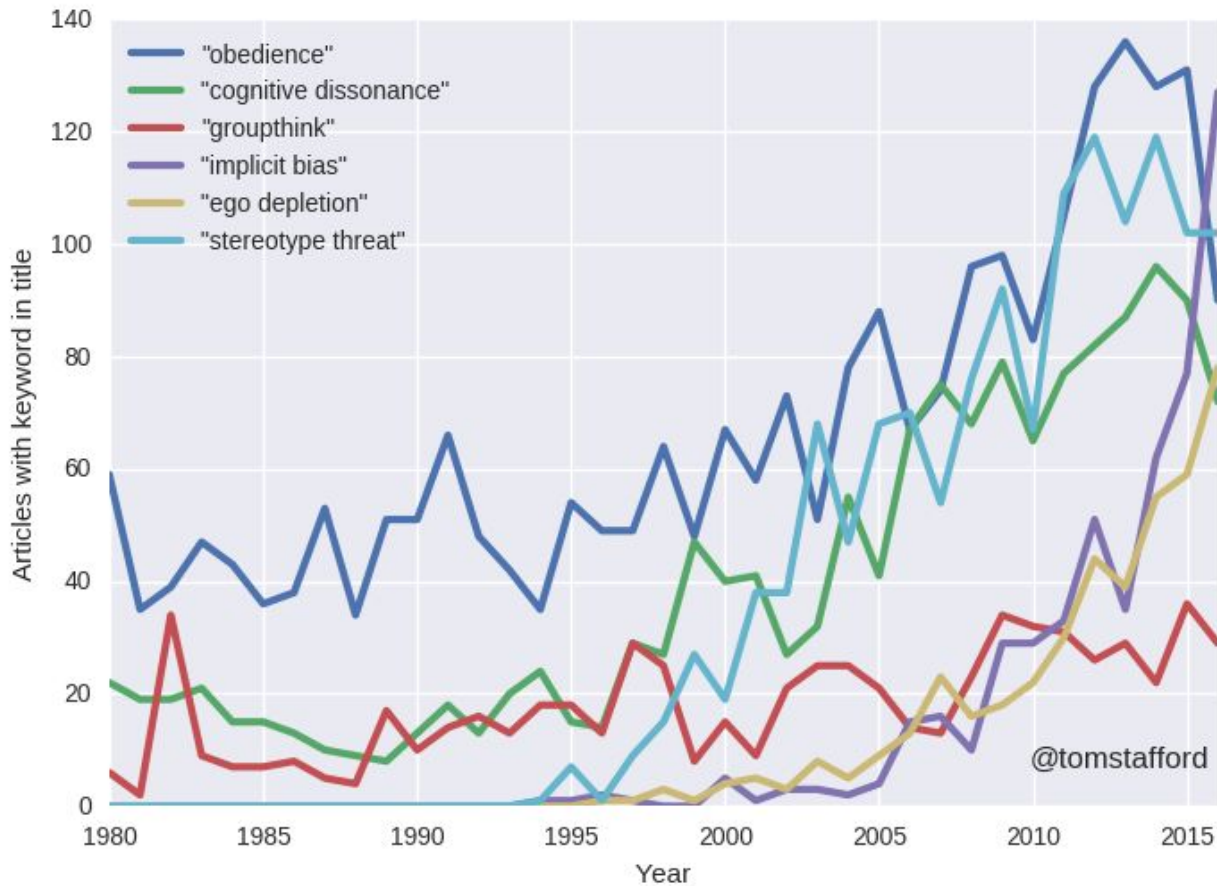
- small differences add up
- small differences wash out

**We can recognise
psychology's method and
theory problems**

Case study: Stereotype Threat

Logic: Stereotype threat one of many potential causes for the observed sex difference.

A popular topic: NSF has funded \$28.6 million of proposals mentioning the phrase



@tomstafford

See also <https://mindhacks.com/2017/03/15/neurotransmitter-fashion/>

And chess...

Maass et al (2008) women who believed they were playing men (at internet chess) less likely to win

Rothgerber & Wolsiefer (2014) women less likely to win when playing men, especially if outmatched

Maass, A., D'Ettola, C., & Cadinu, M. (2008). Checkmate? the role of gender stereotypes in the ultimate intellectual sport. *European Journal of Social Psychology*, 38 (2), 231–245.

Rothgerber, H., & Wolsiefer, K. (2014). A naturalistic study of stereotype threat in young female chess players. *Group Processes & Intergroup Relations*, 17 (1), 79–90.

Robust finding?

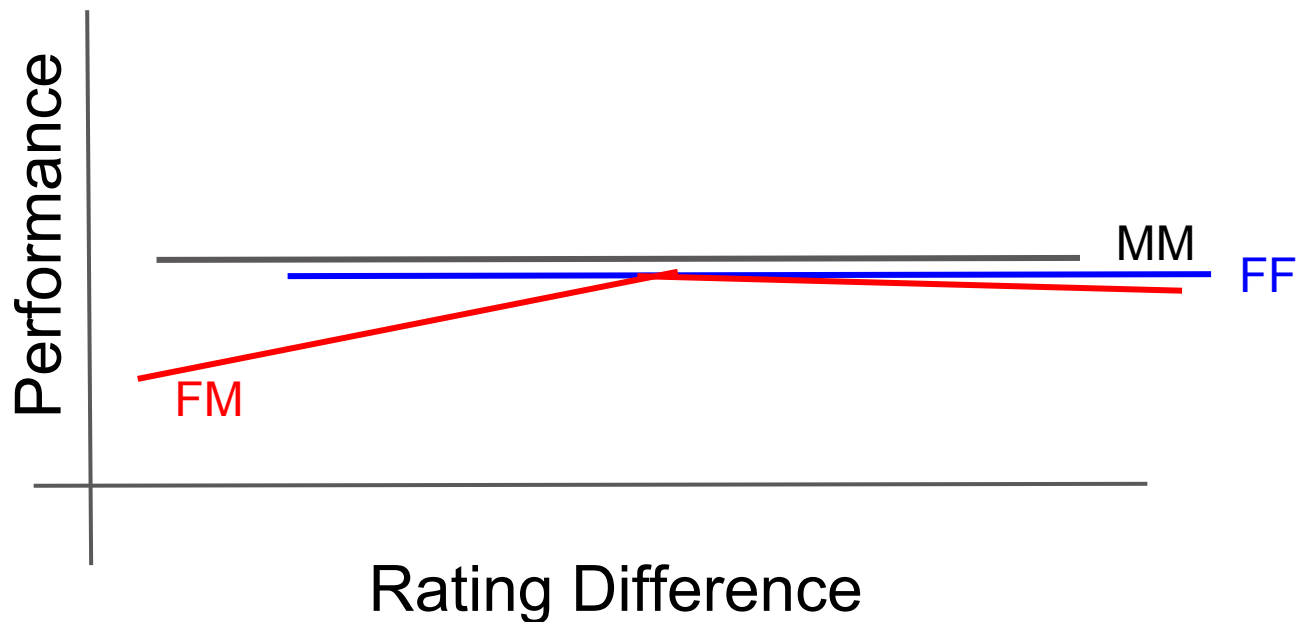
Maass et al (2008) women who believed they were playing men (at internet chess) less likely to win **n = 42**

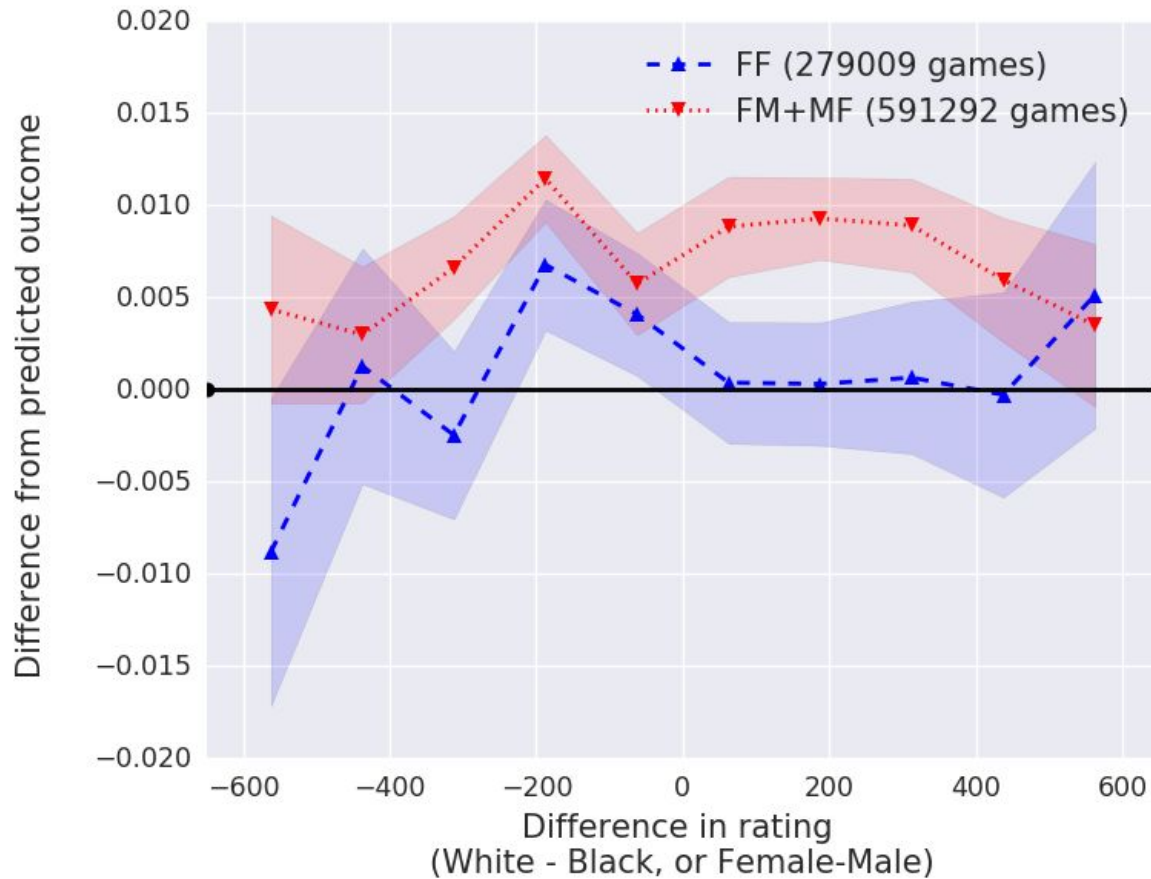
Rothgerber & Wolsiefer (2014) women less likely to win when playing men, especially if outmatched **n = 219**

Publication bias? Flore, P. C., & Wicherts, J. M. (2015). Does stereotype threat influence performance of girls in stereotyped domains? a meta-analysis. *Journal of school psychology, 53* (1), 25–44.

FIDE chess tournament data

~5.5 million games, n (women) = **16,158**





Stafford, T. (in press). [Female chess players outperform expectations when playing men](https://psyarxiv.com/bpy3t/). *Psychological Science*. <https://psyarxiv.com/bpy3t/>

**We can be precise about
what we're arguing for and
against**

And what we believe others believe

“There are fundamental gender differences and they start in the very structure of the human brain”

(Gurian, quoted p xvii)

“The female brain is predominantly hard-wired for empathy. The male brain is predominantly hard-wired for understanding and building systems”

(Baron-Cohen, quoted p xix)

“I have chosen to emphasise scientific truth over political correctness, even through scientific truths may not always be welcome”

(Brizendrine, quote p162)

**We can define the
rhetorical terrain**

There are large
and/or immutable
sex differences in
cognition



There are NO large
and/or immutable
sex differences in
cognition



How the debate is characterised determines
the “reasonable” conclusions (i.e. what is
in-between the poles of the spectrum)

There are large
and/or immutable
sex differences in
cognition



There are NO large
and/or immutable
sex differences in
cognition

Sex differences in
cognition are
exaggerated



Sex differences in
cognition are NOT
exaggerated

END

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