

SEX & MONEY

SEX DIFFERENCES IN NEUROBIOLOGY OF FINANCIAL DECISION MAKING

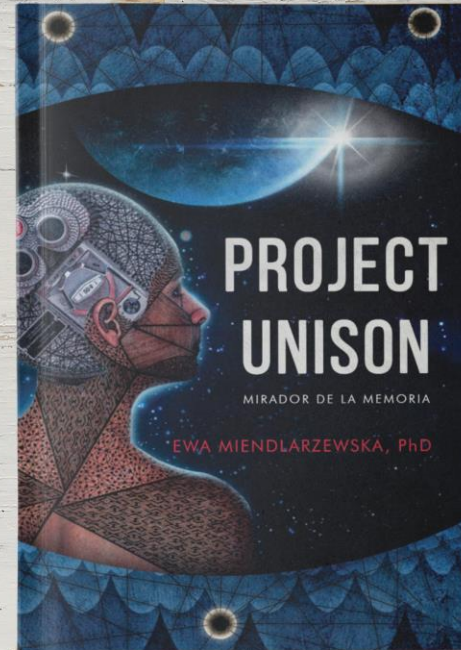
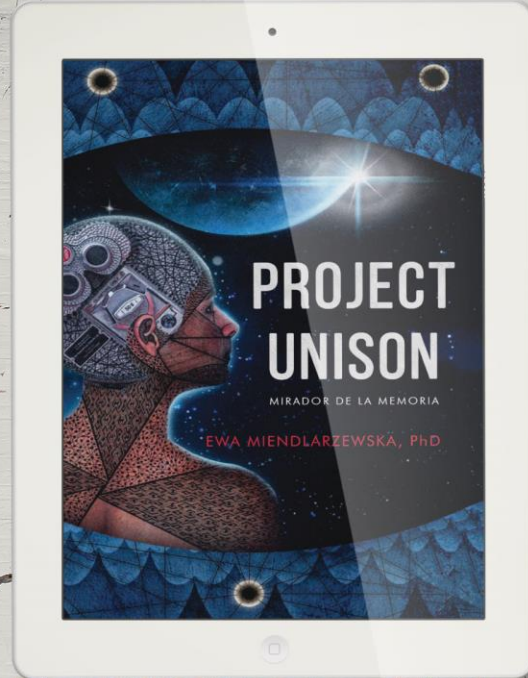
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A NEUROSCIENCE-FICTION SUSPENSE



I'M LOOKING FOR A LITERARY AGENT FOR MY NEXT BOOK!

WHO WANTS TO BE RICH?

BUSINESS

Romantic



Give Everything,

Quantify Nothing, and Create

Something Greater Than Yourself

TIM LEBERRECHT

BEAUTY AND THE BEAST?

Money addiction in the finance industry

“Value for Money” ?

“Money is the crowbar of power.”

(Friedrich Nietzsche)

NECESSARY
EVIL



HOW TO FIX FINANCE BY SAVING
HUMAN RIGHTS



PRIMARY
REWARD



SECONDARY
REWARD

Why neuroscience?



PRIMARY
REWARD



STORABLE AND DIVISIBLE

**If a social contract exists.
Requires trust and belief**

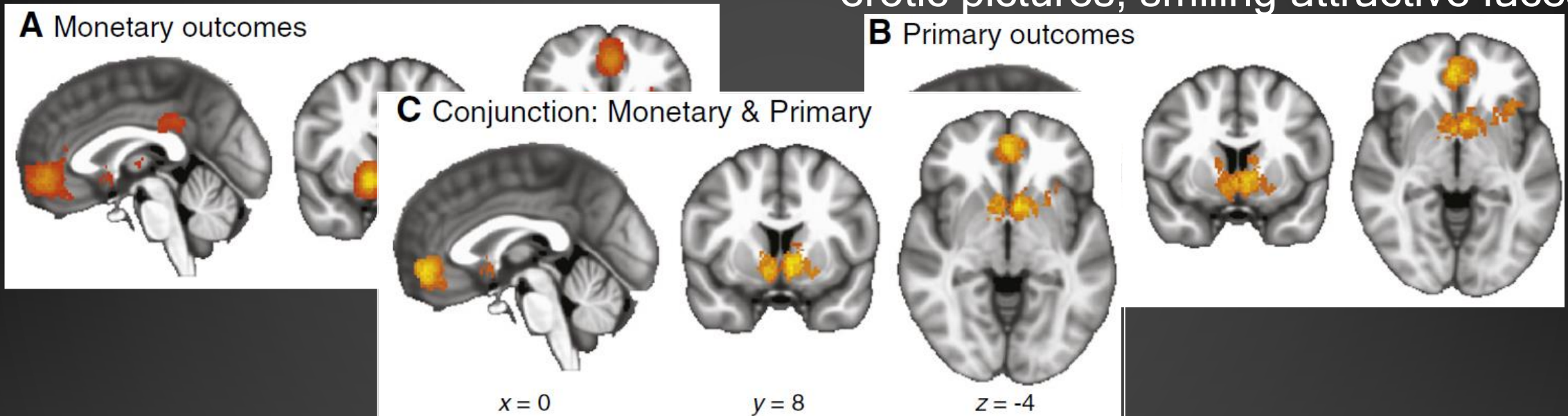
SECONDARY
REWARD

Neurofinance studies how humans make
decisions under **uncertainty**

THE BRAIN'S (subjective) VALUATION SYSTEM

Outcome delivery: money

Outcome delivery: food, pleasant odors, erotic pictures, smiling attractive faces



Money accumulated for later consumption

Primary rewards directly consumed in the experiment

BIOLOGICAL REALISM IN DECISION NEUROSCIENCE

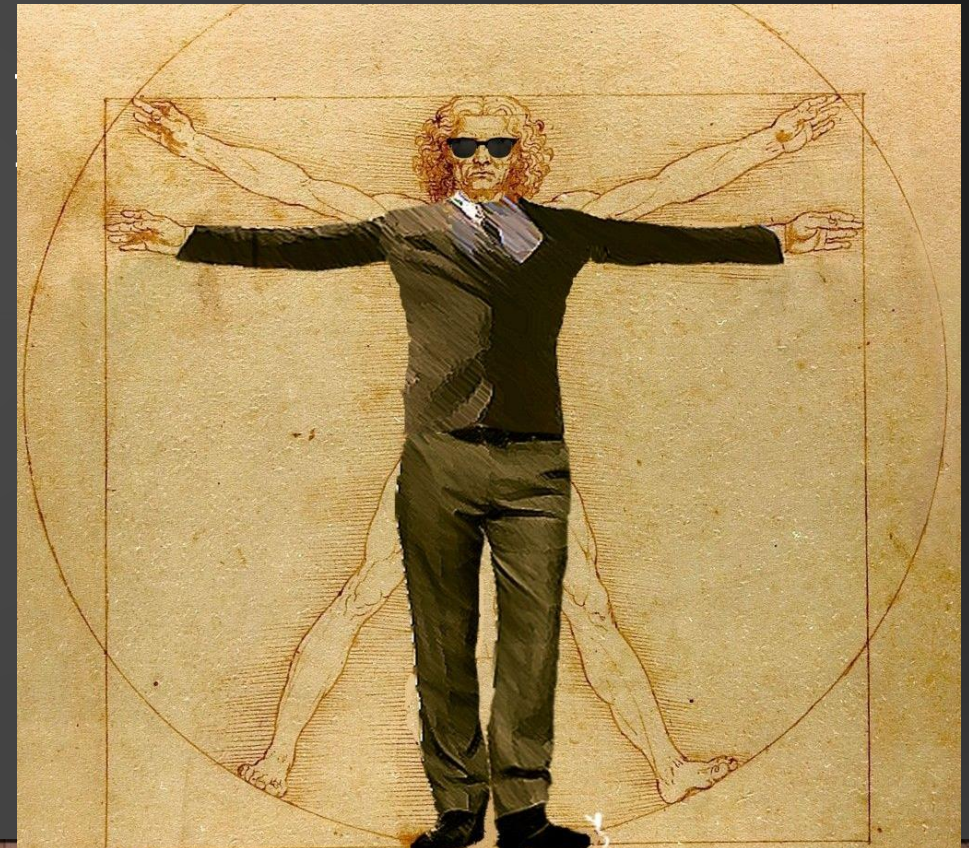
HOMO SAPIENS

how we evolved to decide



HOMO ECONOMICUS

how we assumed we decided



Mobbs, D., Trimmer, P. C., Blumstein, D. T. & Dayan, P. Foraging for foundations in decision neuroscience: Insights from ethology. *Nat. Rev. Neurosci.* **19**, 419–427 (2018).

<https://greenbookblog.org/2012/08/28/4-common-myths-about-human-decision-making/>

BIOLOGICAL REALISM IN DECISION NEUROSCIENCE

HOMO SAPIENS

how we evolved to decide

1. Value (Energy)-based decisions (Foraging): decisions that contribute to homeostatic well-being
 - Competitive foraging;
 - Foraging under the risk of predation
2. Reproduction

COMPUTATIONAL RATIONALITY: the brain contains a set of heuristic mechanisms that evolved to make fast and accurate decisions due to computational limits.

HOMO ECONOMICUS

how we assumed we decided

A rational agent has stable preferences and acts independently to **maximize her subjective utility** in the presence of complete information

HAS “IRRATIONAL BIASES”

WHAT IS MONEY?



- Medium of exchange



- Store of value



- Token of trust that enhances collaboration between strangers



- Emotions: Happiness, fear, greed, anxiety, safety, human rights, future belief, pride, success, crime, ethics

- Power



- Sacred gift?



- Unreal...

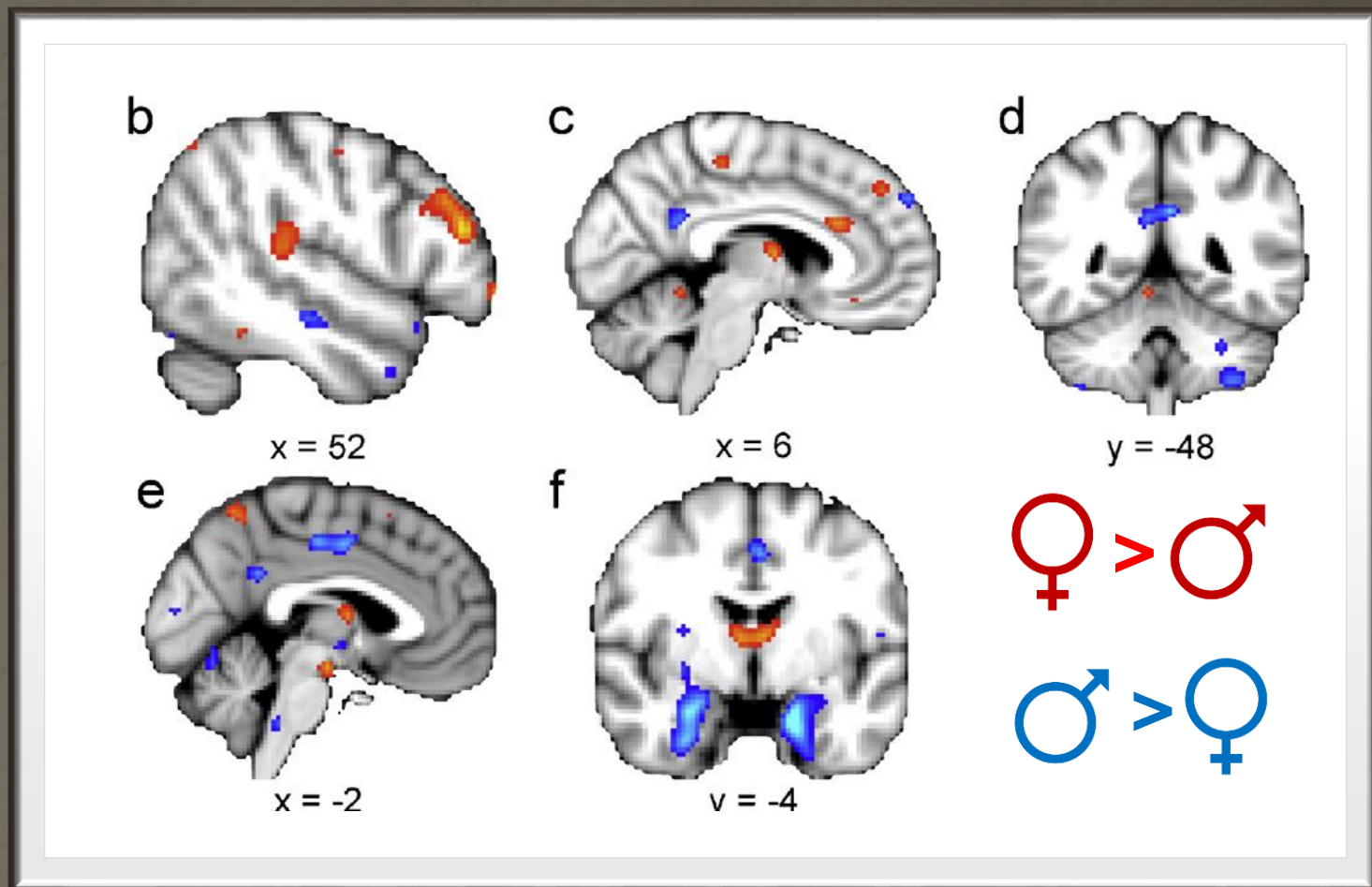


In today's economy, financial industries “generate” or turn around, 4x as much money as the real economy leading to the paradoxical situation where global leaders make decisions affecting millions of people based on a thing that does not exist.

Yuval Harari

SEX DIFFERENCES IN BRAIN STRUCTURE

- Sex differences in developmental programs
- Genotype by sex interactions
- Sex differences in neural circuits



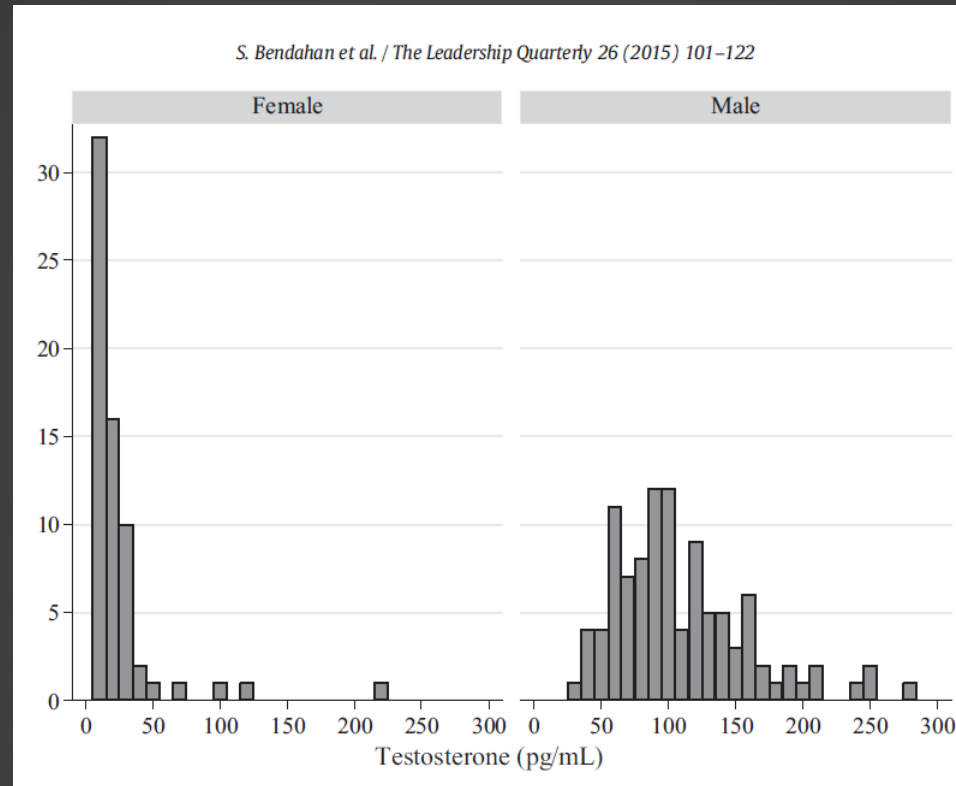
OVERALL, MALES AND FEMALES ARE MORE SIMILAR THAN THEY ARE DIFFERENT ACROSS A BROAD SPECTRUM OF PSYCHOLOGICAL ATTRIBUTES.



DIFFERENCES DUE TO REPRODUCTION STRATEGIES: THE POWER MOTIVE

Women want Sustainable resources ... and hence want men with high status

- Females also compete to establish a social hierarchy but their politics are much more about **alliances and resource sharing** and much less the “zero-sum games”
- Women are less oriented toward personal striving for status over others, and instead express their dominance for **group-oriented goals**.



Men want status

- Men more than women tend to rate **egoistic dominant acts as more socially desirable**, including “managing to get one’s own way”, “Flattering to get one’s own way”, “Complaining about having to do a favor for someone”, and “Blaming others when things went wrong.”.
- Positive relationship between T/C and dominance motivation/status striving.



FEMALE LEADERSHIP

- Women tend to adopt a more democratic and less authoritarian style of leadership.
- Authoritarian leadership is correlated with endogenous T levels
- Women are better at managing conflict without escalation to violence
- Particularly successful at leadership by forming (female) coalitions.
- Men are better in combat. People tend to view physically strong leaders as more effective at recruiting & mobilizing followers.

FORAGING UNDER COMPETITION AND THREAT OF PREDATION

- Under stress, the adrenal axis (HPA) regulates the gonadal function by inhibiting reproductive behavior of the gonadal axis (HPG).
 - regulates risk-taking behavior.
- Dominants have high Testosterone/Cortisol ratio
- In women, implicit Power motivation was positively associated with basal **estradiol** concentrations
- Winner effect in men: losing decreases T. In women, competition increases T and C but nothing happens with winning/losing
- High T/C ratio predicts proneness to confront threat; marker for aggression, risk-taking and psychopathy
- Testosterone disrupts collaboration by increasing the **egocentricity** in individuals' choices
- CEO's facial masculinity predicts his firm's likelihood of being subject to an SEC enforcement action
- Men shift to riskier decision making in resource decisions when observed by potential competitors of equal status

Sherman, G. D., Lerner, J. S., Josephs, R. A., Renshon, J. & Gross, J. J. The interaction of testosterone and cortisol is associated with attained status in male executives. *J. Pers. Soc. Psychol.* **110**, 921–929 (2016).

Stanton, S. J. & Schultheiss, O. C. Basal and dynamic relationships between implicit power motivation and estradiol in women. *Horm. Behav.* **52**, 571–580 (2007).

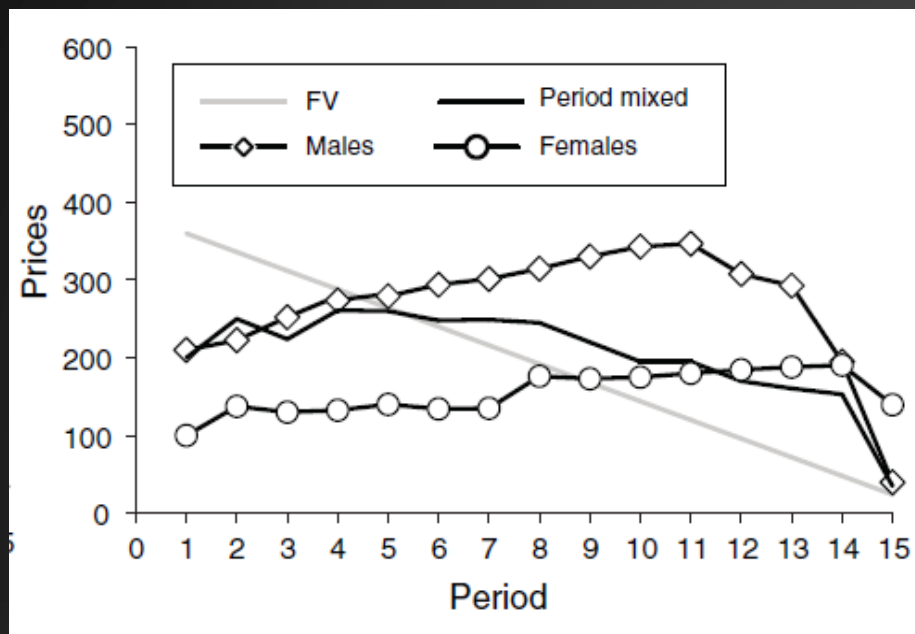
Barel, E., Shahrabani, S. & Tzischinsky, O. Sex hormone/cortisol ratios differentially modulate risk-taking in men and women. *Evol. Psychol.* **15**, 1–10 (2017).

Wright, N. D. et al. Testosterone disrupts human collaboration by increasing egocentric choices. *Proc. Biol. Sci.* **279**, 2275–80 (2012).

Jia, Y., Lent, L. Van & Zeng, Y. Masculinity, testosterone, and financial misreporting. *J. Account. Res.* **52**, 1195–1246 (2014).

(Ermer et al., 2008)

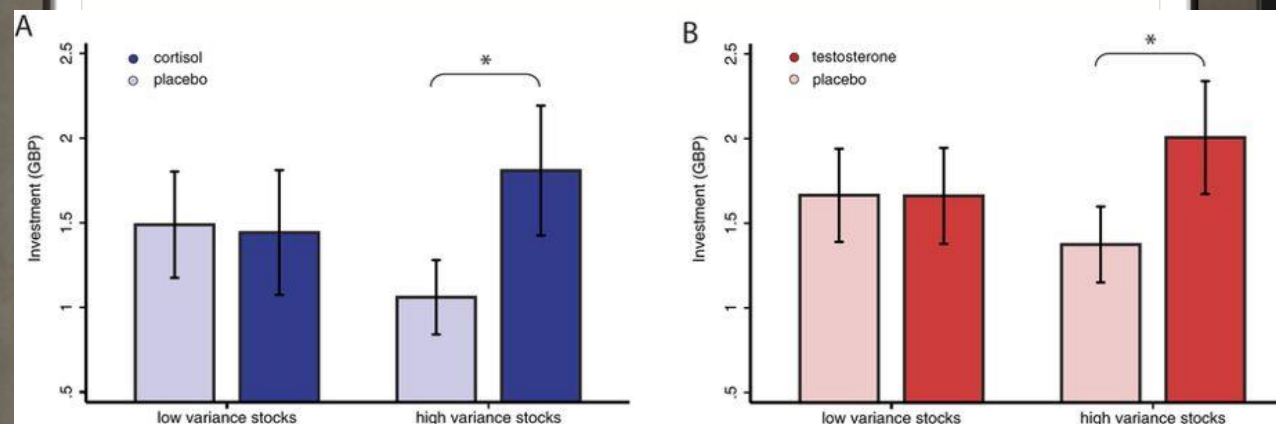
WITH MONEY...



Women are much less likely to generate overpricing in stock exchange transactions

Negative correlation between fraction of **women** in the market and **size of observed price bubble** (meta-analysis of 35 experimental markets)

Causal role of C and T on risky asset investment in men only. This resulted in market bubble followed by crash



- Testosterone induced increased optimism about future price changes
- Cortisol affected risk preferences directly

DIFFERENT MOTIVES IN FINANCIAL DECISIONS?



Gender Differences In
Prosociality

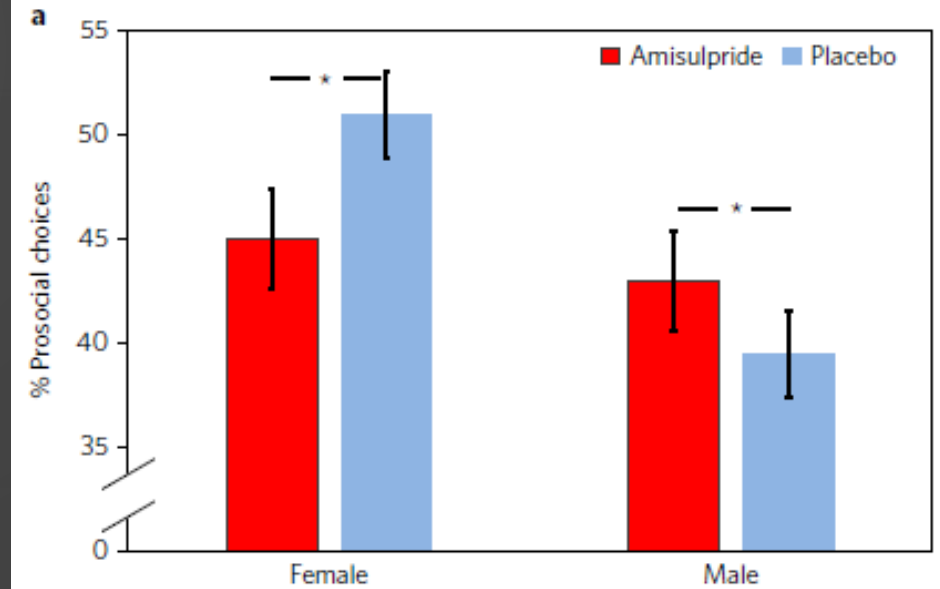
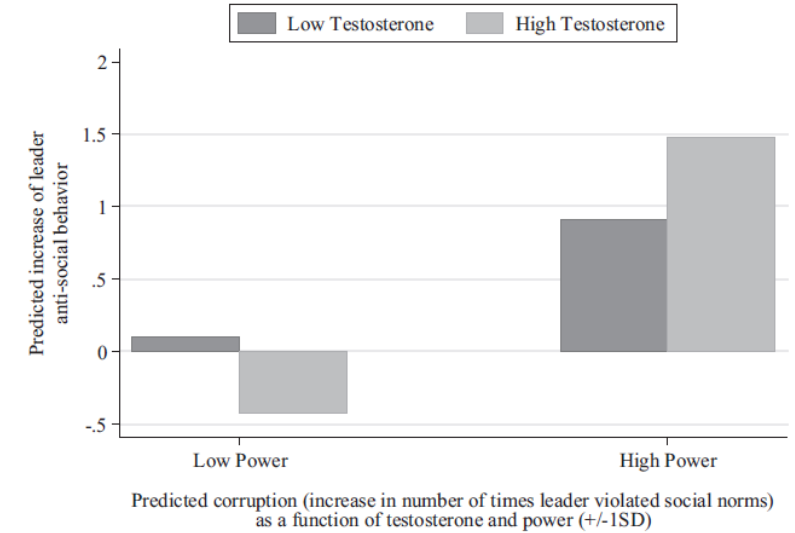
Sharing Money Is More
Rewarding For Women



Testosterone + Power =
Corruption And Selfish
Behaviors

« High Testosterone Levels
Amplify The Effect Of Power On
Corruption »

S. Bendahan et al. / *The Leadership Quarterly* 26 (2015) 101–122



RISK TAKING AND INVESTING



- Higher testosterone associated with lower risk aversion among women, but not men.



- Individuals high in testosterone and low in risk aversion more likely to choose **risky careers in finance**.



- Women are less overconfident in their assessment of potential future gains.



- Financial literacy Gender Gap: 23% in CH, 12% in Germany, 20% in the NL, 16% in the US

Sapienza, P., Zingales, L. & Maestripieri, D. Gender differences in financial risk aversion and career choices are affected by testosterone. *Proc. Natl. Acad. Sci.* **106**, 15268–15273 (2009).
 Fehr-Duda, H., De Gennaro, M. & Schubert, R. Gender, financial risk, and probability weights. *Theory and Decision* **60**, (2006).
 Hügelschäfer, S. & Achtziger, A. On confident men and rational women: It's all on your

mind(set). *J. Econ. Psychol.* **32**, 1–15 (2011).
 retirement planning: The gender gap. *Journal of Retirement Planning* **28**, 10–15 (2013).
 Bucher-Koenen, T., Lüscher, A., & Schenk, S. (2017). Gender Differences in Financial Risk Taking: An Overview and New Insights. *J. Consum. Aff.* **51**, 255–283 (2017).
<http://www.usfunds.com/interactive/who-wins-the-money-matchup-men-vs-women/>



Who Wins The Money Matchup?

MEN vs WOMEN

65%
WORKING-AGE MEN

ARE SAVING FOR
RETIREMENT

53%
WORKING-AGE WOMEN



59%

HAVE A LOW-RISK
PORTFOLIO

68%



61%

WORK WITH
AN ADVISOR

78%



53%

FEEL CONFIDENT
MAKING INVESTMENT
DECISIONS

38%



WOMEN'S

RETURN ON INVESTMENT WAS

1.2%
HIGHER THAN MEN on average.





**HOW DO WE MAKE
FINANCE MORE
ROMANTIC?**

THERE IS HOPE!



We can learn and change our habits and implicit associations: Brain plasticity



Money is a human invention



New chapters in the story of money and financial services need to be written and taught: More Women in Finance



PRIMARY
REWARD



SECONDARY
REWARD

GOAL

MY ACTIONS

GENEVA FINANCE
RESEARCH INSTITUTE


Our Wealth Network

 Swiss
Sustainable
Finance

.....
SUSTAINABLE
FINANCE
GENEVA 
.....
where finance meets impact

- **Sustainable Finance:** sustainable funds, green bonds, impact investing, microfinance, active ownership, credits for sustainable projects and development of the whole financial system in a more sustainable way.
- Educating future “Wealth Managers” about Neurofinance (UniGE)
- Financial education for women and young people

A close-up photograph of a gorilla's face. The gorilla is looking upwards and slightly to the left with a contemplative or thoughtful expression. Its hand is visible near its chin. The background is a blurred forest scene with sunlight filtering through the trees.

**THANK YOU.
QUESTIONS?**