

**Misinformation in the Digital Age : Comparative Contexts  
and Policy Lessons**



INSTITUTE for  
ADVANCED  
STUDY in  
TOULOUSE

# **Misinformation: the long view**

**Alberto Acerbi**

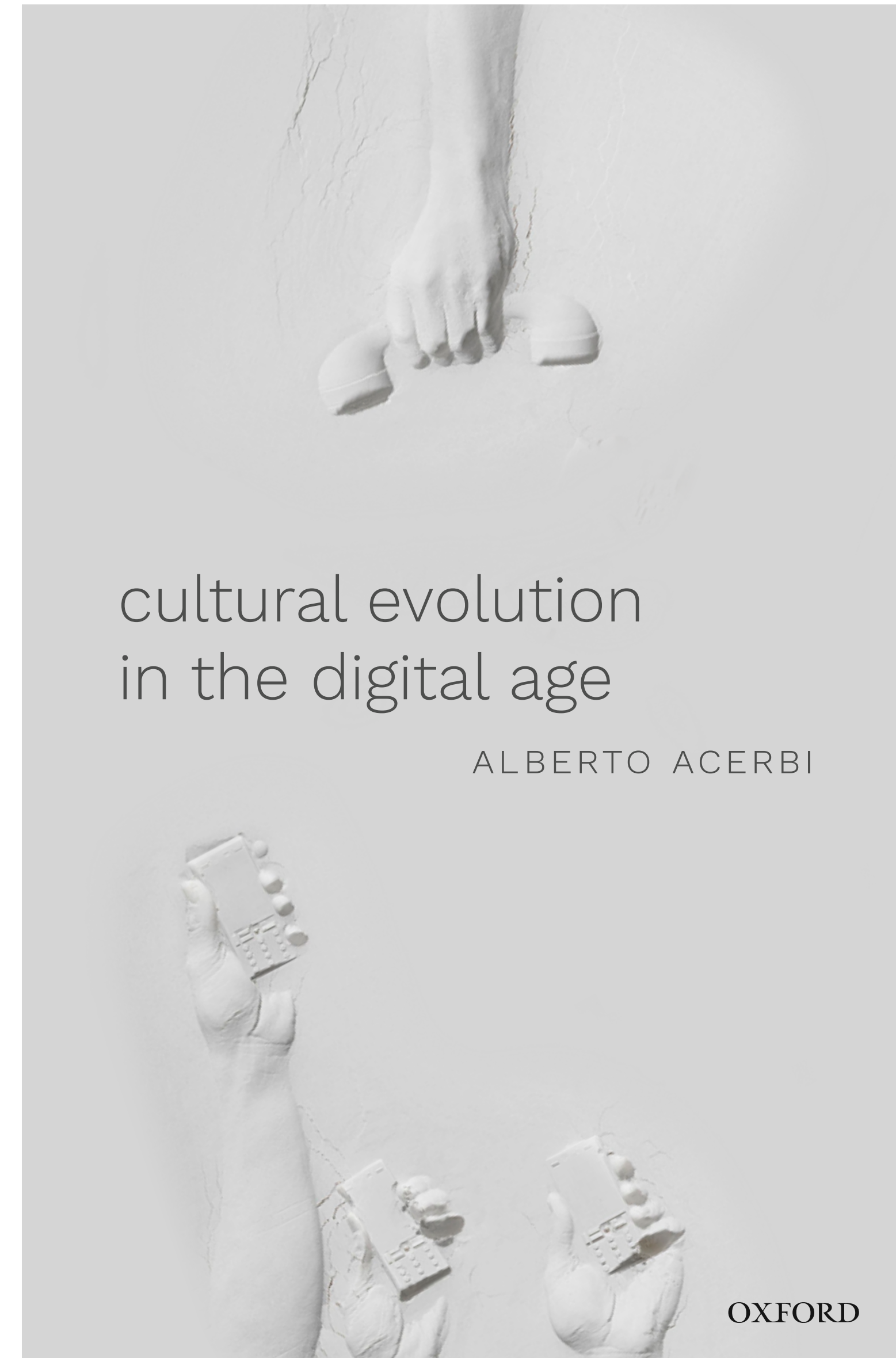
**Centre for Culture and Evolution  
Division of Psychology**



**Brunel**  
University  
London

# A bit about myself...

- Research in the field of cultural evolution
- ~2015: application of cultural evolutionary theory to digital media
- “Big data needs big theory”

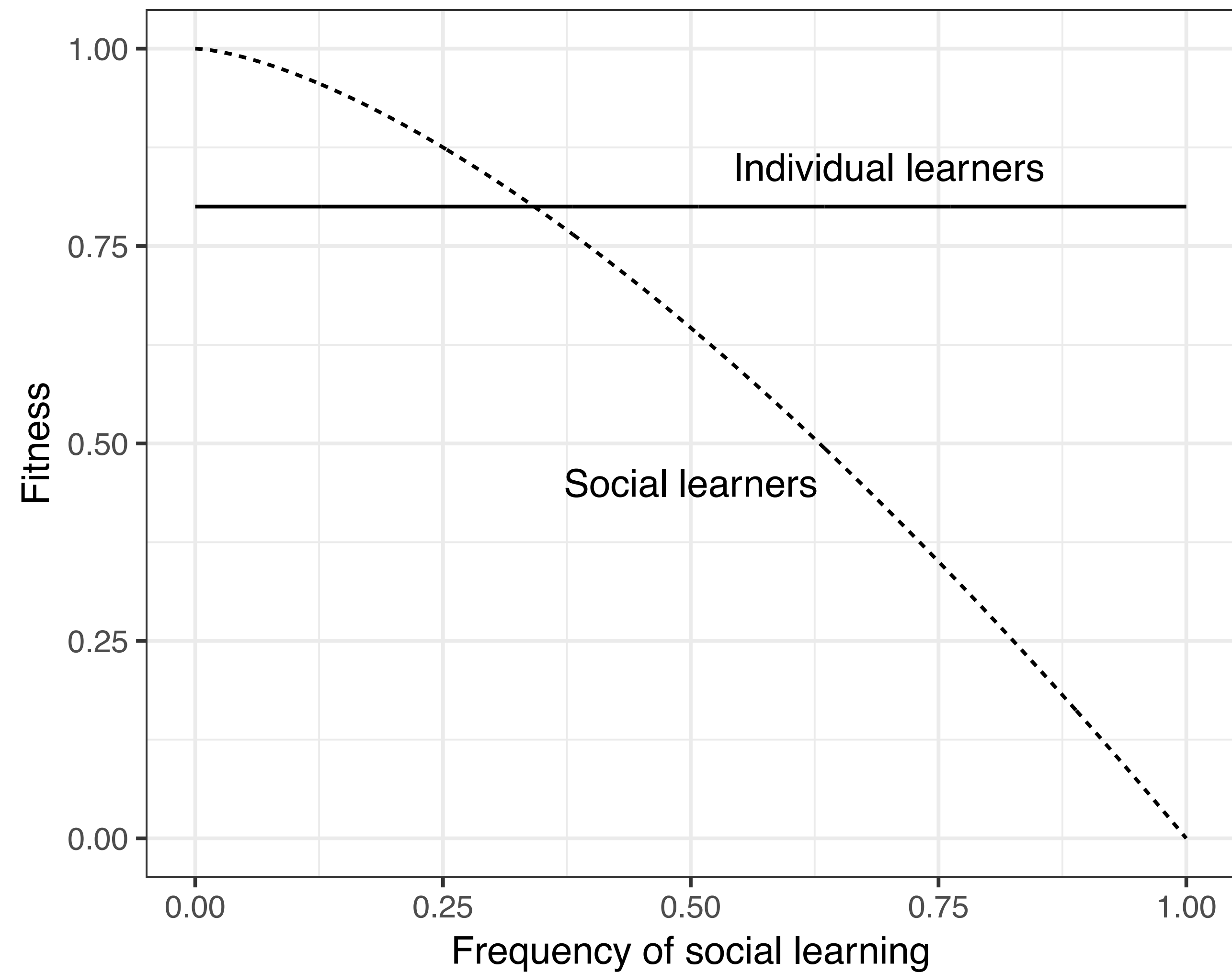


# Plan of the talk

- Humans are wary learners
- Misinformation as cognitively attractive content
- A low amount of misinformation is expected (and consistent with empirical data on social media)
- Focus on the overall condition of the online information ecosystem



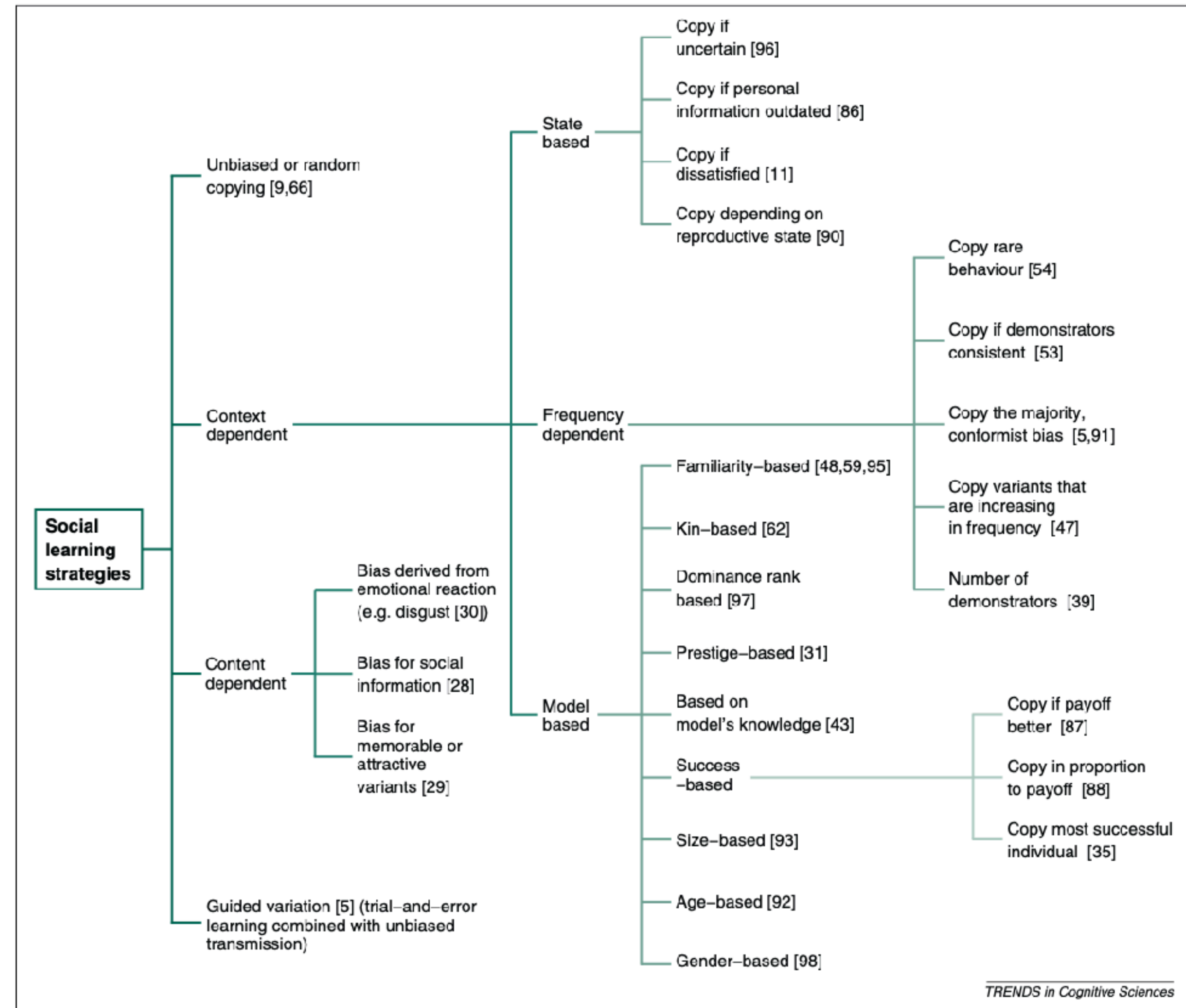
# Wary learners



Rogers, 1988



# Wary learners



**Figure 1.** Social learning strategies for which there is significant theoretical or empirical support. The tree structure is purely conceptual and not based on any empirical data on homology or similarity of cognition. The sources given are not necessarily the first descriptions or the strongest evidence, but are intended as literature entry points for readers.

# Wary learners

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without any social learning fit the best. Once again, this result suggests that players did not consistently use the social information provided in this treatment in any way captured by our models. Moreover, this information was

# Wary learners

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returns when taking social information into account. However, **a considerable number of participants did not use social information** under medium environmental variability. More-



# Wary learners

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individuals rarely did so. By the end of an experimental run, only about 20% of participants choose to view social information. Thus, the better fit of the social model applies only in those cases, which are overall the minority. When participants did view social

# Wary learners

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*Journal of Evolutionary Psychology*, 7(2009)4, 309–329  
DOI: 10.1556/JEP.7.2009.4.4

## **BIASES FOR ACQUIRING INFORMATION INDIVIDUALLY RATHER THAN SOCIALLY**

**KIMMO ERIKSSON<sup>1,2\*</sup> AND PONTUS STRIMLING<sup>2</sup>**

Eriksson and Strimling, 2009

# Wary learners

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Evolution and Human Behavior

Volume 32, Issue 5, September 2011, Pages 334-342



Original Article

An experimental comparison of human social learning strategies: **payoff-biased social learning is adaptive but underused**

Alex Mesoudi  

Mesoudi, 2011



# Wary learners

- Systematic review of experiments with adults where both social information and individual information are available shows that underuse of social information is **10 times** more common than correct/overuse.

PHILOSOPHICAL  
TRANSACTIONS B

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Review



**Cite this article:** Morin O, Jacquet PO, Vaesen K, Acerbi A. 2021 Social information use and social information waste. *Phil. Trans. R. Soc. B* **376**: 20200052.

<https://doi.org/10.1098/rstb.2020.0052>

## Social information use and social information waste

Olivier Morin<sup>1,2</sup>, Pierre Olivier Jacquet<sup>3</sup>, Krist Vaesen<sup>4</sup> and Alberto Acerbi<sup>5</sup>

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<sup>2</sup>Minds and Traditions Research Group, Max Planck Institute for the Science of Human History, Jena, Germany

<sup>3</sup>Laboratoire de Neurosciences Cognitives et Computationnelles (LNC2), Département d'Etudes Cognitives, INSERM, Ecole Normale Supérieure, PSL Research University, Paris, France

<sup>4</sup>School of Innovation Sciences, Eindhoven University of Technology, Eindhoven, The Netherlands

<sup>5</sup>Centre for Culture and Evolution, Brunel University London, London, UK

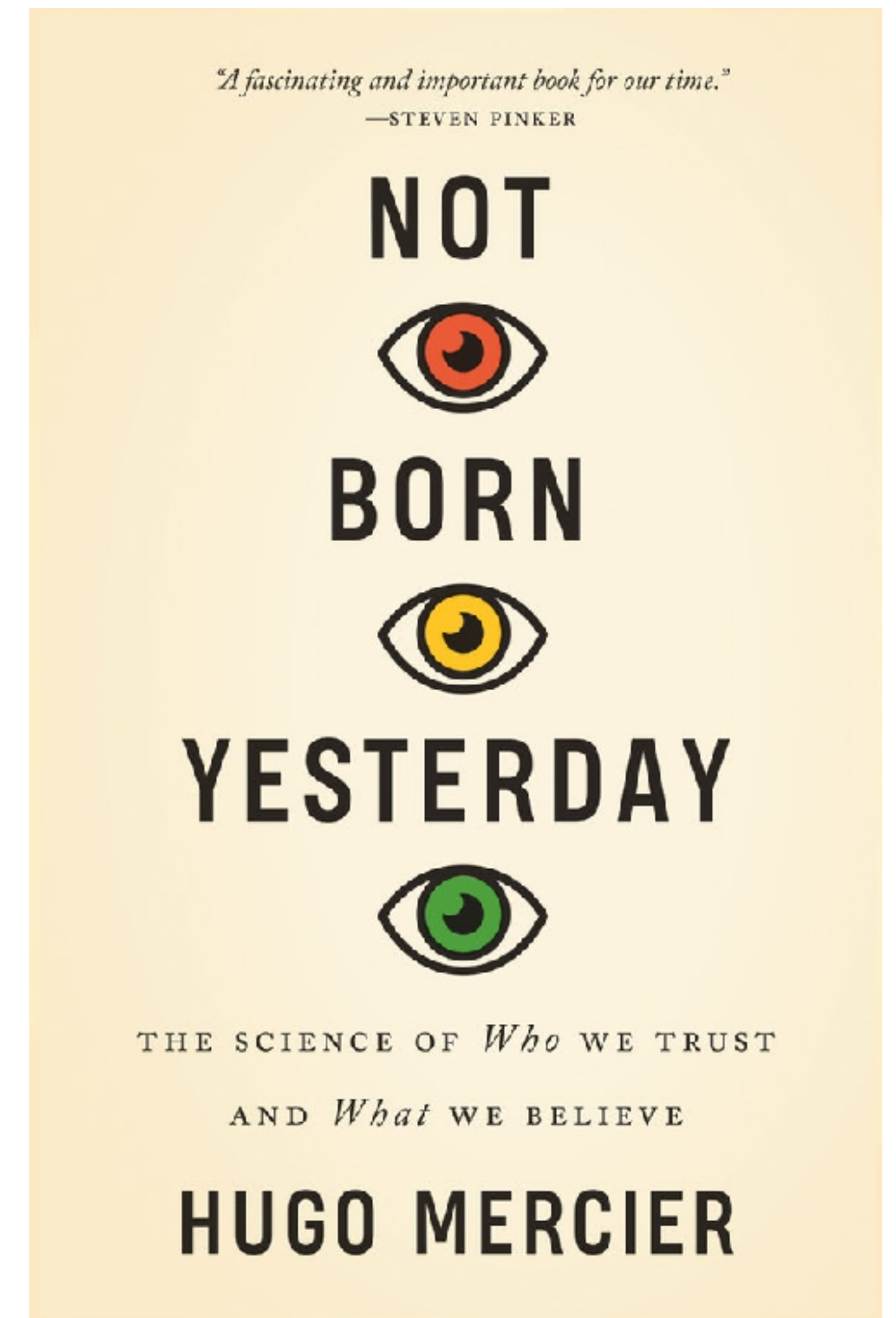
 OM, 0000-0002-6216-1307; AA, 0000-0001-5827-8003

Social information is immensely valuable. Yet we waste it. The information we get from observing other humans and from communicating with them is a cheap and reliable informational resource. It is considered the backbone of

Morin et al., 2021

# Wary learners

- Consider the possibility of deception
- More sophisticated cognitive mechanisms (plausibility checking, trust calibration, reasoning, etc...)
- “default” state: not accepting new information



Mercier, 2020



# Cognitive attractive and online misinformation

- Accuracy-oriented VS goal oriented motivations





# Cognitive attractive and online misinformation

- Accuracy-oriented VS goal oriented motivations

<b>Top 10 Fake News Articles by Facebook Engagements</b>				
1	2	3	4	5
<small>BABYSITTER TRANSPORTED TO HOSPITAL AFTER INSERTING A BABY IN HER VAGINA</small> 	<small>FBI SEIZES OVER 3,000 PENISES DURING RAID AT MORGUE EMPLOYEE'S HOME</small> 	<small>Charles Manson to be released on parole, to Johnson County, TX</small> 	<small>Police: Chester Bennington Was Murdered</small> 	<small>MORGUE EMPLOYEE CREMATED BY MISTAKE WHILE TAKING A NAP</small> 
<b>1,204,400</b> Babysitter transported to hospital after inserting a baby in her vagina	<b>1,145,470</b> FBI seizes over 3,000 penises during raid at morgue employee's home	<b>1,125,031</b> Charles Manson to be released on parole, to Johnson County, TX	<b>1,042,032</b> Police: Chester Bennington Was Murdered	<b>993,205</b> Morgue employee cremated by mistake while taking a nap
6	7	8	9	10
 <small>Angry Woman Cuts Off Man's Penis for Not Making Eye Contact During Sex</small>	<small>Female Legislators Unveil 'Male Ejaculation Bill' Forbidding The Disposal Of Unused Semen</small> 	<small>President Trump Orders the Execution of Five Turkeys Pardoned by Obama</small> 	<small>ELDERLY WOMAN ACCUSED OF TRAINING HER 65 CATS TO STEAL FROM NEIGHBORS</small> 	<small>COUPLE HOSPITALIZED AFTER MAN GETS HIS HEAD STUCK IN HIS WIFE'S VAGINA</small> 
<b>981,423</b> Angry Woman Cuts Off Man's Penis for Not Making Eye Contact During Sex - TRENDING	<b>966,498</b> Female Legislators Unveil 'Male Ejaculation Bill' Forbidding The Disposal Of Unused Semen	<b>914,429</b> President Trump Orders the Execution of Five Turkeys Pardoned by Obama	<b>690,437</b> Elderly woman accused of training her 65 cats to steal from neighbors	<b>672,093</b> Couple hospitalized after man gets his head stuck in his wife's vagina



# Cognitive attractive and online misinformation

- Accuracy-oriented VS goal oriented motivations - what about engagement?

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# Cognitive attractive and online misinformation

- Not all cultural traits are equal



**Masks**



**Caricatures**

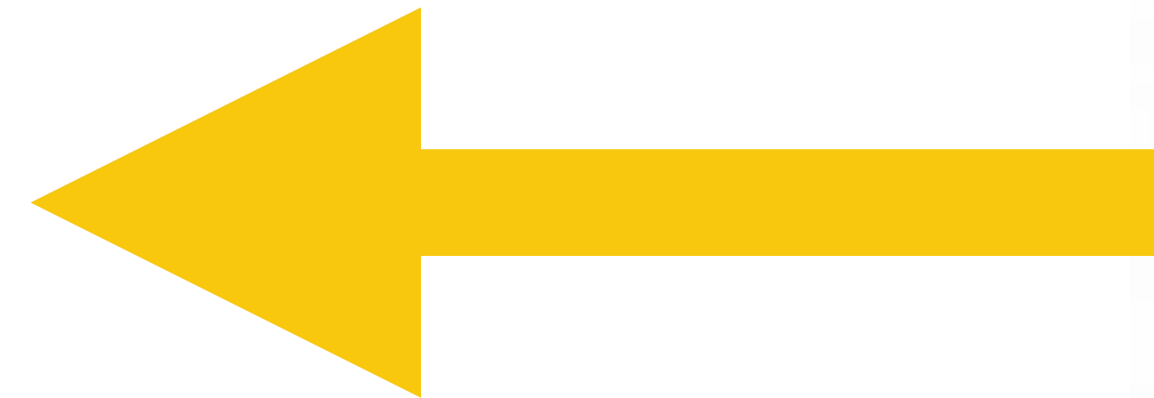
**Made-up faces**



**Portraits**

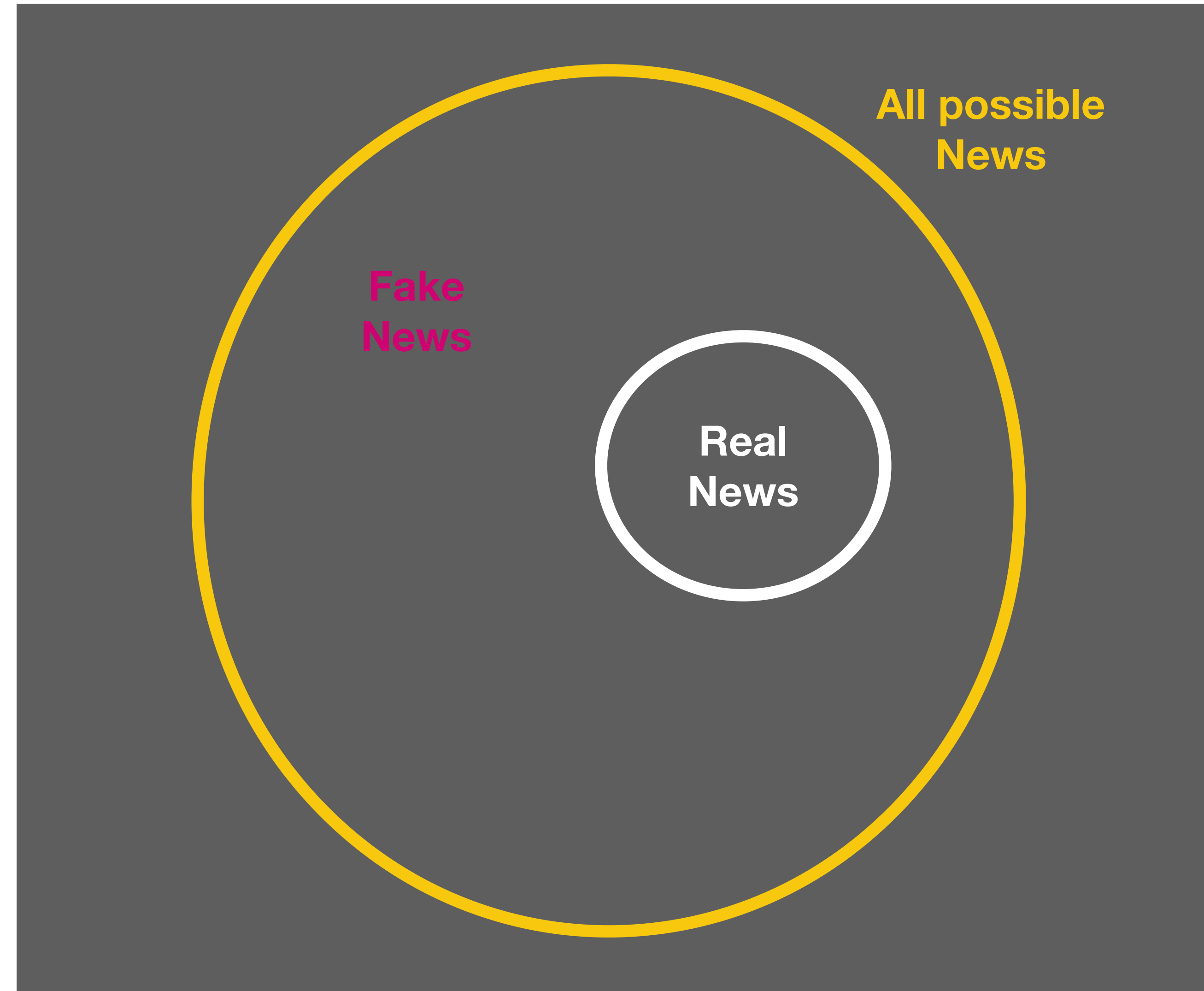


**Real faces**



# Cognitive attractive and online misinformation

- Specific content favours cultural traits' success (e.g. negative content, threat-related information, disgust, etc.)
- Misinformation, less constrained by reality, can be manufactured to exploit attractive features



Acerbi, 2019



# Negative content

- negative information is better remembered and transmitted than positive information
- information framed negatively is considered more truthful than the same information framed positively
- documented in news, but also e.g. literature, song lyrics



Bebbington et al., 2017

# Negative content

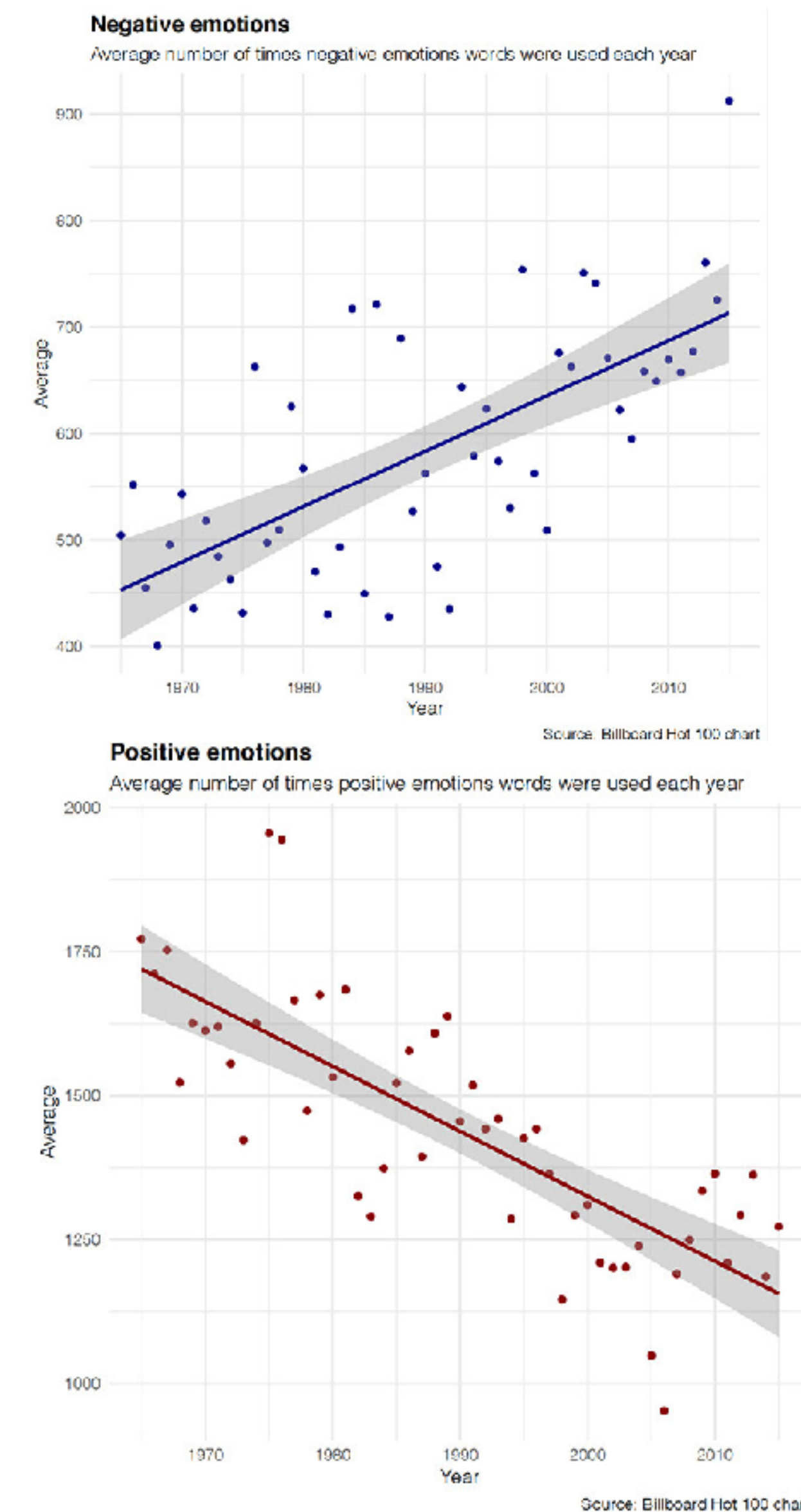
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When civil litigation cases go to trial, 60% of plaintiffs lose, winning no money

When civil litigation cases go to trial, 40% of plaintiffs succeed and win money

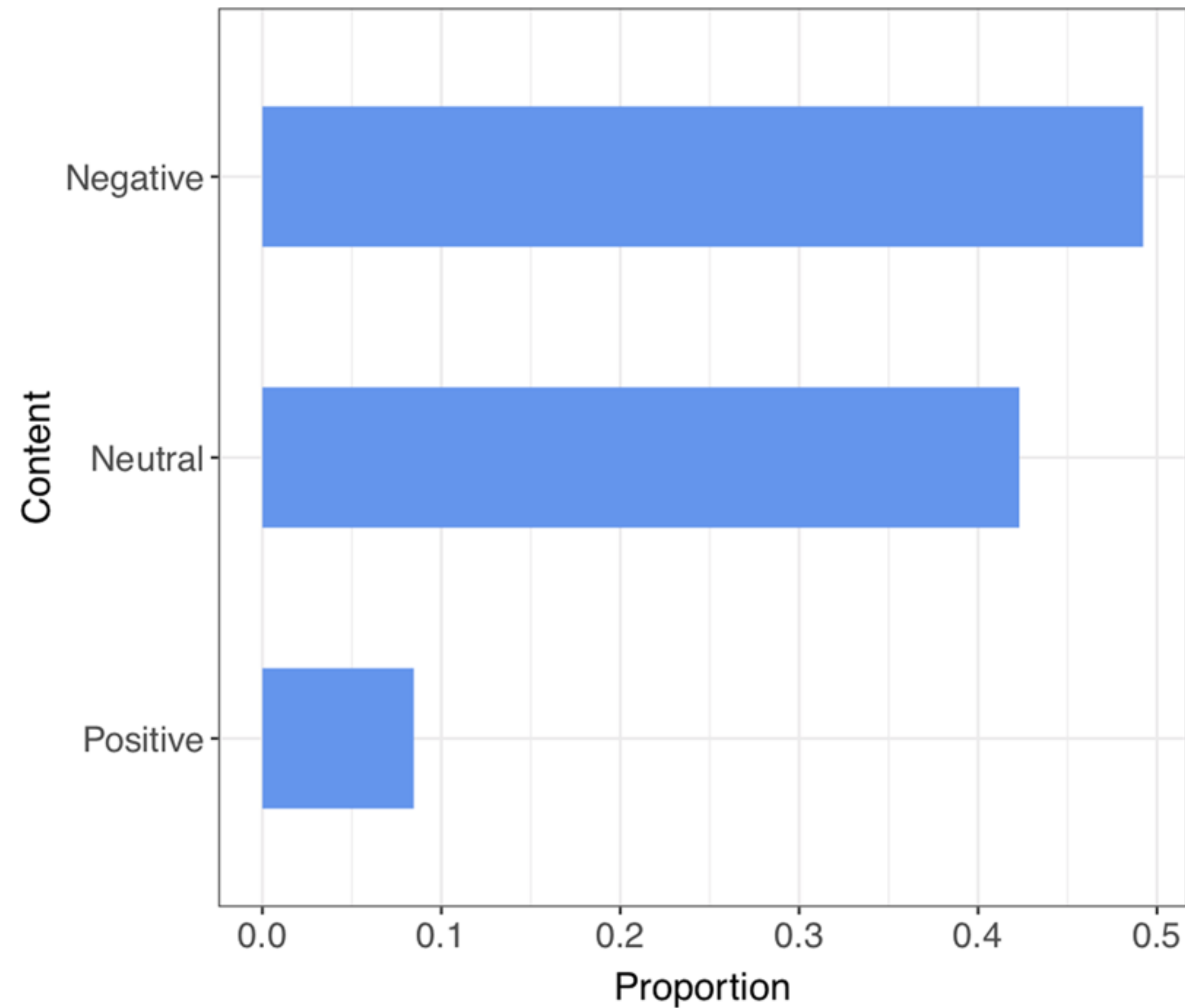
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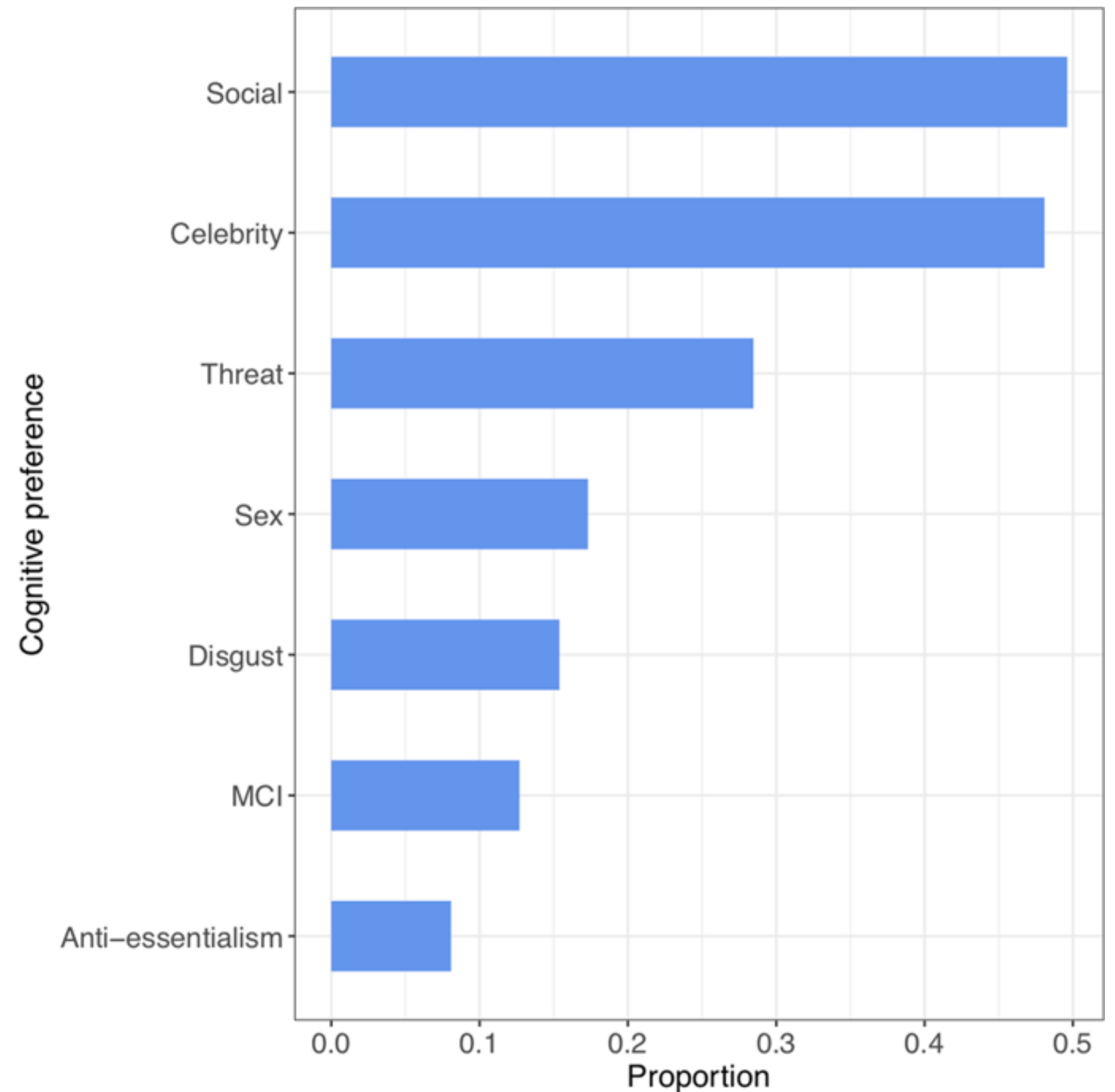


Negative content **5 times** more common than positive content in “fake news”

Acerbi, 2019

# Cognitive attractive and online misinformation

- One third of articles classified as “threat-related” information
- ~50%: “gossip”





# Cognitive attractive and online misinformation

- Misinformation is **low-quality** information that spreads because of **drawback** of online communication
- Misinformation is **high-quality** information that spreads because of **efficiency** of online communication (quality = cognitive appeal)



# Is misinformation abundant on social media?

- “0.15% of Americans’ daily media diet”, Allen et al., 2020
- “Only 1% of individuals accounted for 80% of fake news source exposures, and 0.1% accounted for nearly 80% of fake news sources shared”, Grinberg et al., 2019
- “The vast majority of Facebook users in our data did not share any articles from fake news domains in 2016 at all”, Guess et al., 2019
- “Of the 2.7 million tweets in our data, only 85,344 ( $\approx 3\%$ ) contain links to national news websites, fake or real. Of the tweeted news links, 3,269 ( $\approx 4\%$ ) come from websites with a history of publishing fake news”, Osmundsen et al., 2021

reviewed in Altay et al., 2021

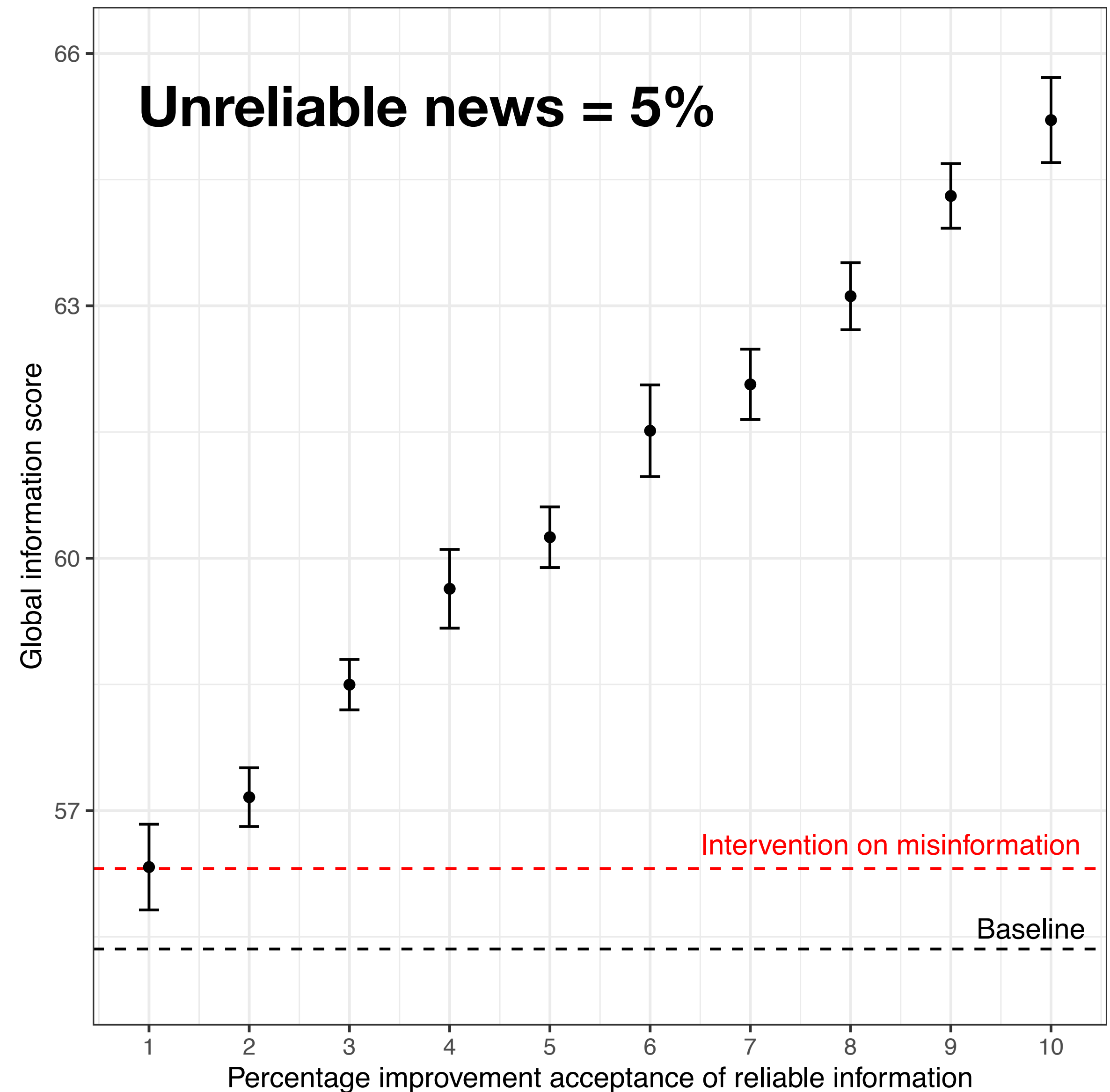
# Focus on the overall condition of the digital ecosystem

- Focus on other aspect of the social/digital media systems, e.g. trust in reliable news, how to enhance positive effects, etc.

# Focus on other aspects of the social/digital media system

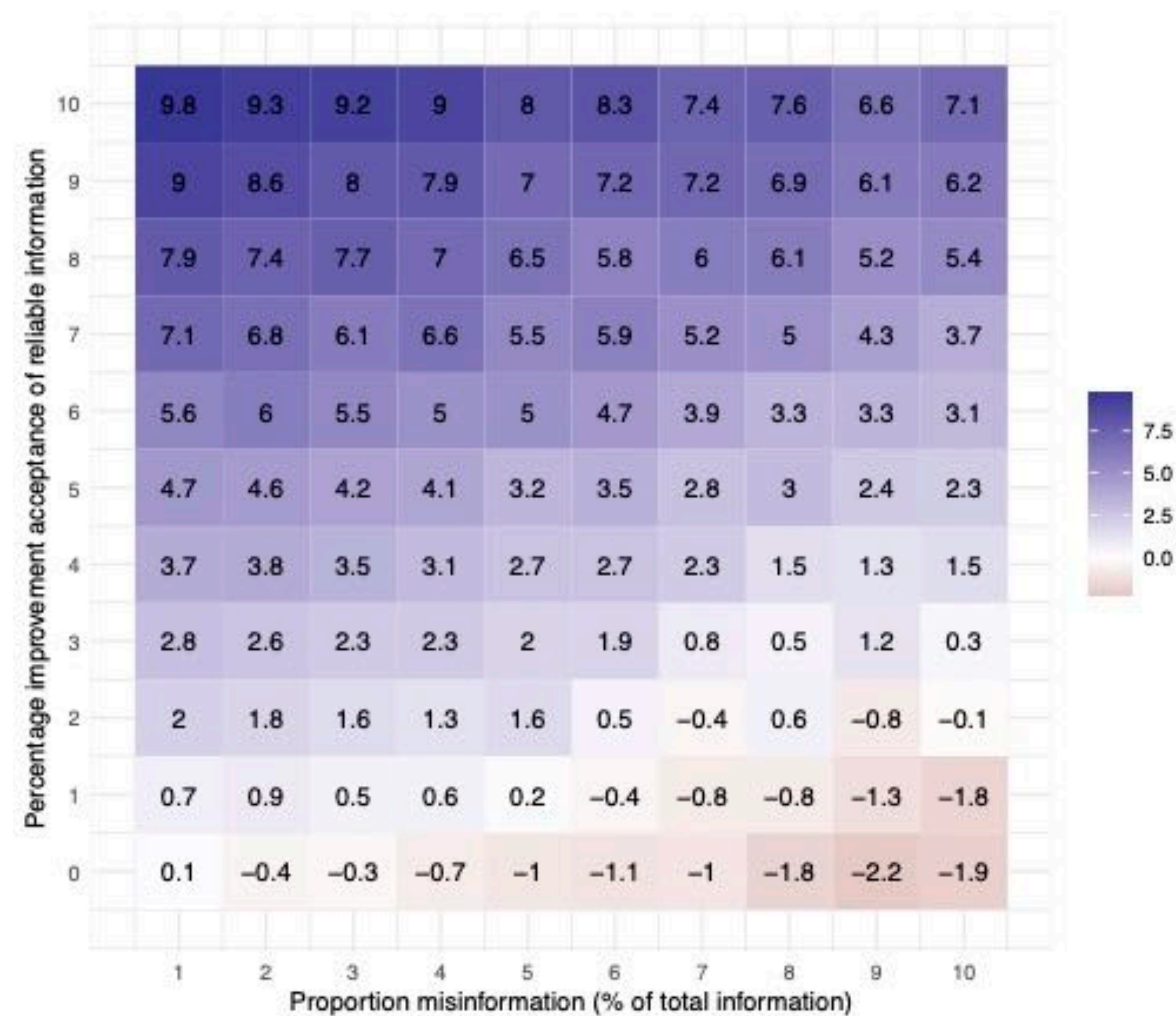
- Individual-based model where agents are exposed to pieces of news
- News can be reliable/unreliable (5% unreliable)
- Individuals have a probability to accept reliable (60%) and unreliable (30%) news.
- We calculate a “global information score” = number of pieces of reliable information accepted minus the number of pieces of misinformation accepted, normalised with the overall amount of news

# Focus on other aspects of the social/digital media system





# Focus on other aspects of the social/digital media system



# Conclusion

- Humans are wary learners
- Misinformation as cognitively attractive content
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# Thank you!



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