

Cultural Evolution in the Digital Age

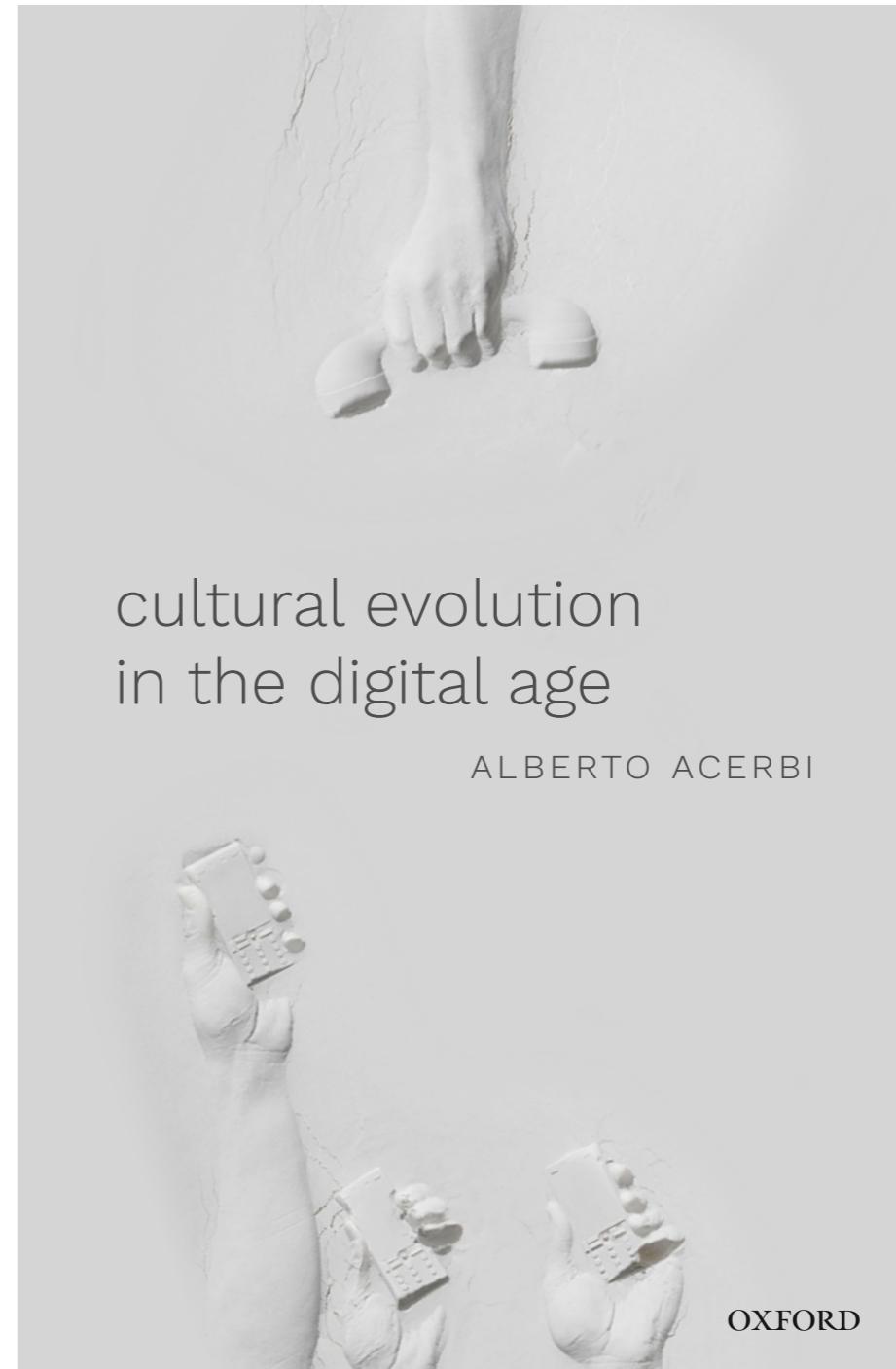
Alberto Acerbi

Cultural Evolution in the Digital Age

- Cultural evolution provides a promising framework to study the effect of the diffusion of digital online media
- Cognitive attraction and online misinformation
- Cumulative cultural evolution online

Cultural Evolution in the Digital Age

- Big data needs (big) theory
- A very social animal





Cognitive attraction and online misinformation

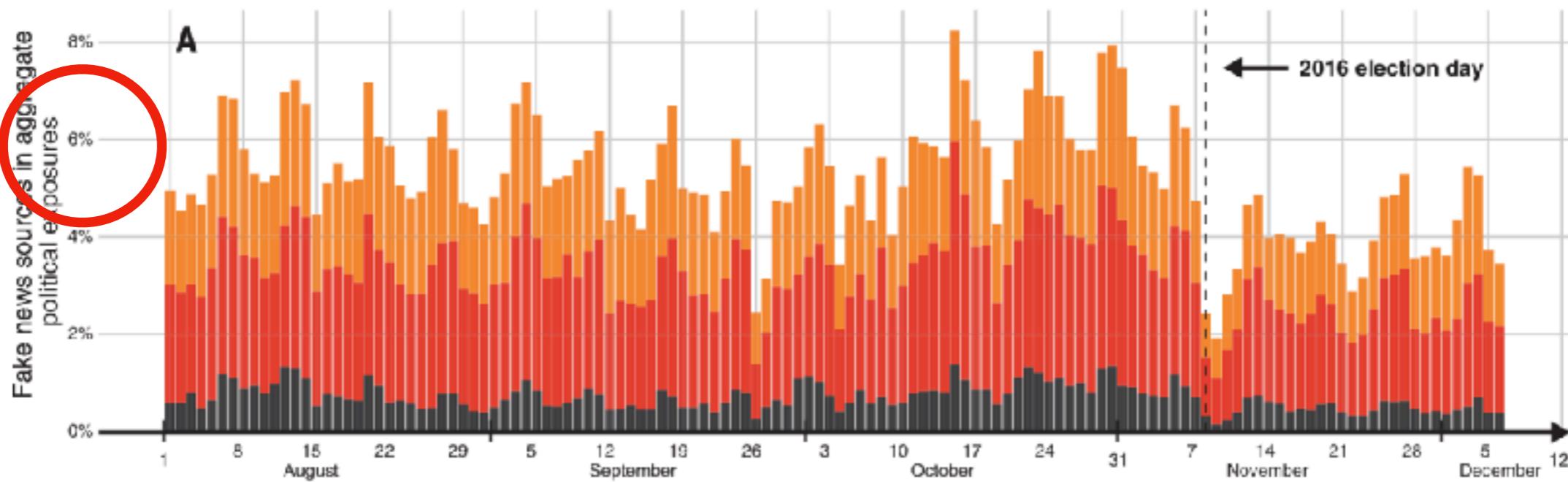
Reach and effects of online misinformation

- How diffuse are fake news?
 - Not much!

Reach and effects of online misinformation

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“Only 1% of individuals accounted for 80% of fake news source exposures, and 0.1% accounted for nearly 80% of fake news sources shared” (N=16,442)

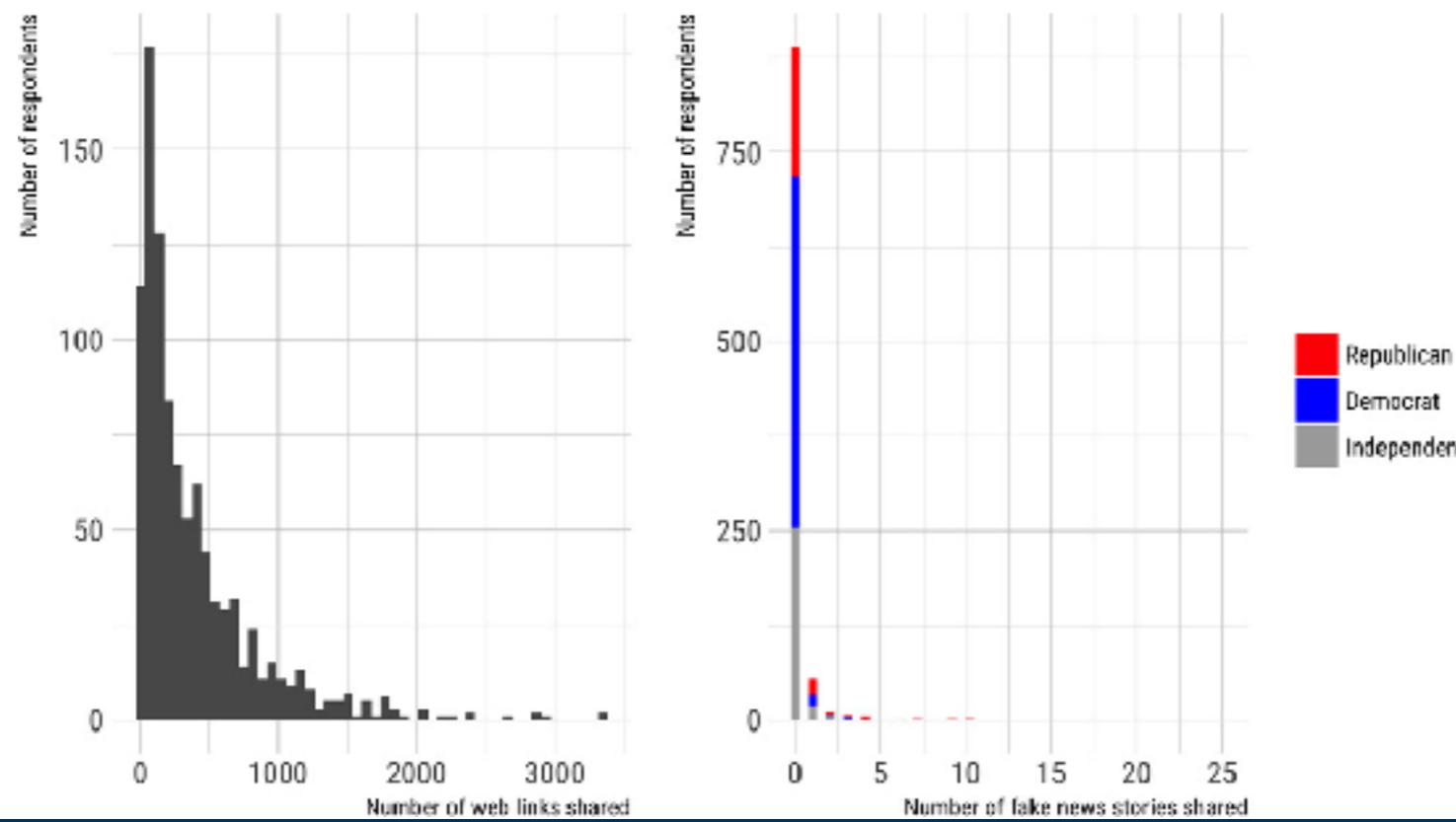


Grinberg et al., 2019

Reach and effects of online misinformation

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 - Not much!

“The vast majority of Facebook users in our data did not share any articles from fake news domains in 2016 at all” (N=3,500)

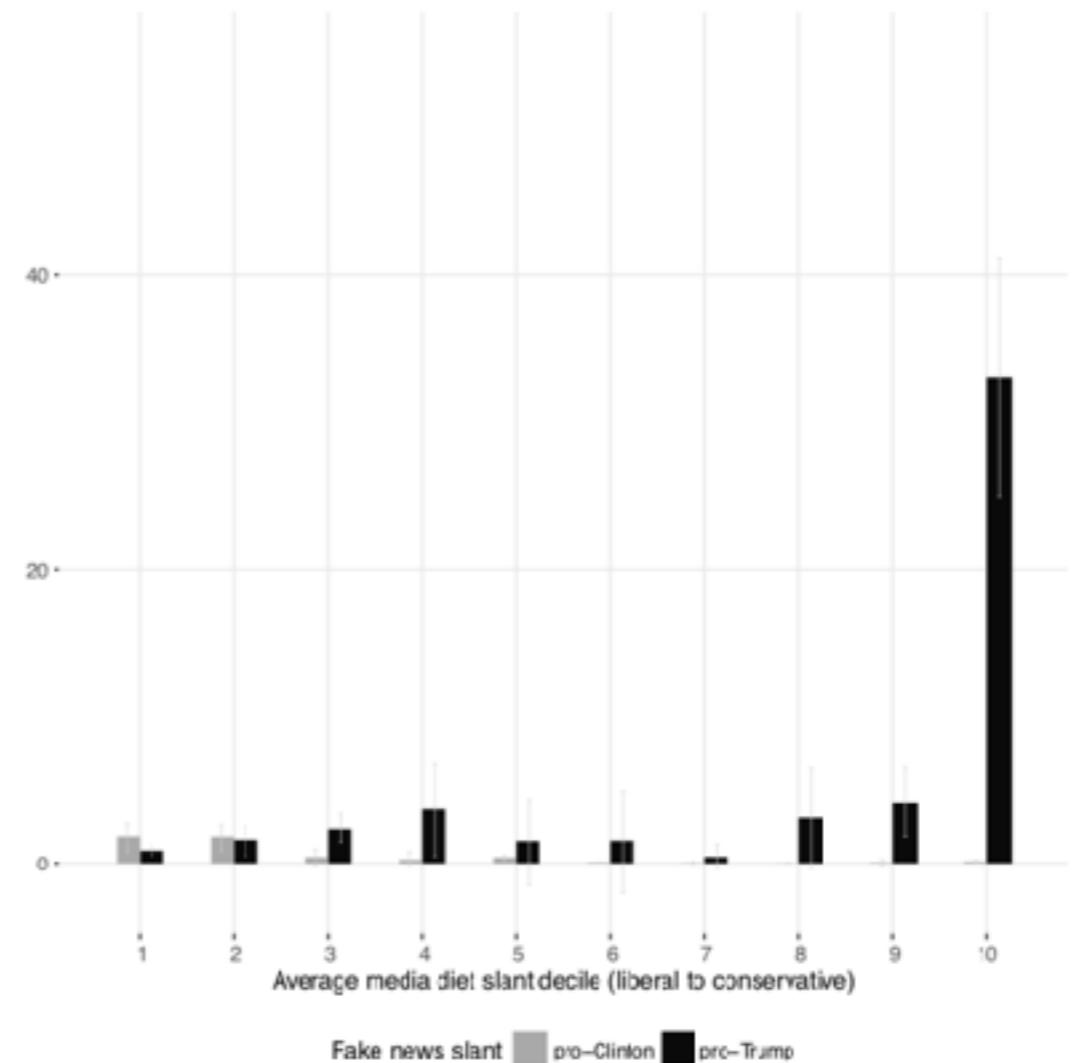


Reach and effects of online misinformation

- How diffuse are fake news?
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- How strong are the effects of fake news?
 - Not very strong!

Reach and effects of online misinformation

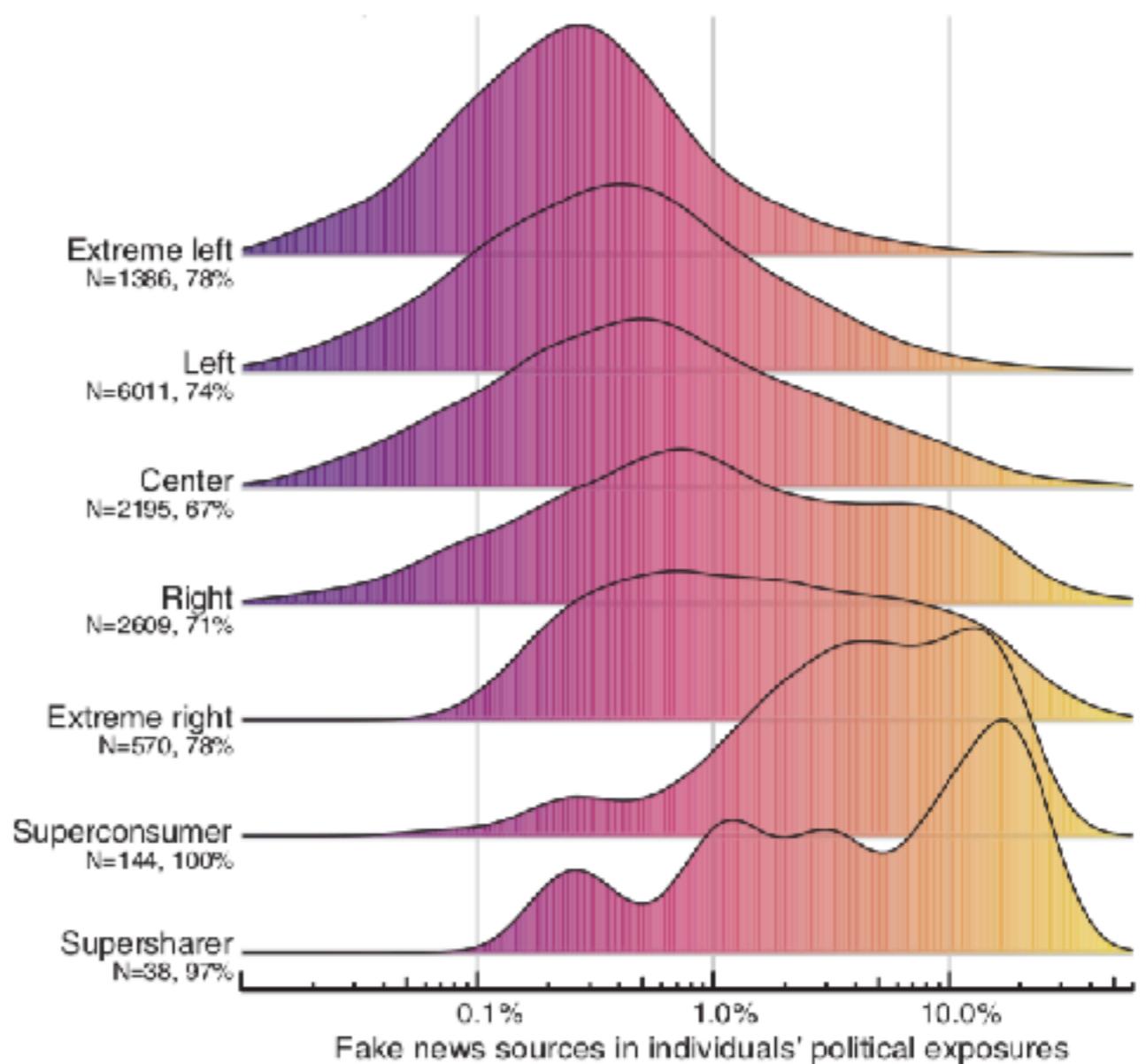
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Guess et al., 2018

Reach and effects of online misinformation

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Reach and effects of online misinformation

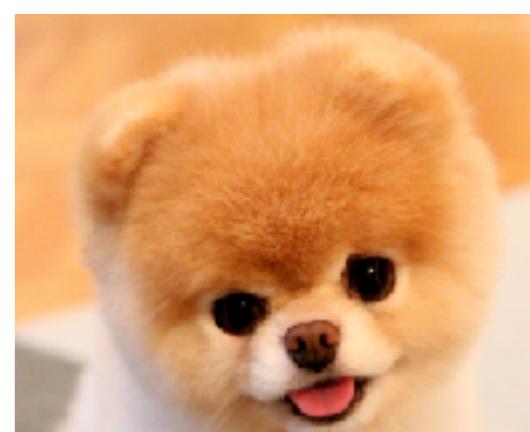
- Empirical evidence of reach and effects of online misinformation is at best mixed.
- This is consistent with evolutionary approaches to culture: for the characteristics allowing communication, social interactions, and learning from others to be evolved in the first place, we should not be too gullible - e.g. social learning strategies (Laland, 2004), epistemic vigilance (Sperber et al., 2010)
- still online misinformation exists...

Cognitive attraction and online misinformation

- what makes a cultural trait successful?
- Transmission chain experiments
- general cognitive preferences make some cultural traits more likely to succeed with respect to others, making them more appealing, attention-grabbing and memorable

Cognitive attraction and online misinformation

- misinformation (online or offline) is not constrained by reality.
- We can shape misinformation to be appealing, attention-grabbing and memorable more than what we can do with real information.
- (does not need to be a conscious process)

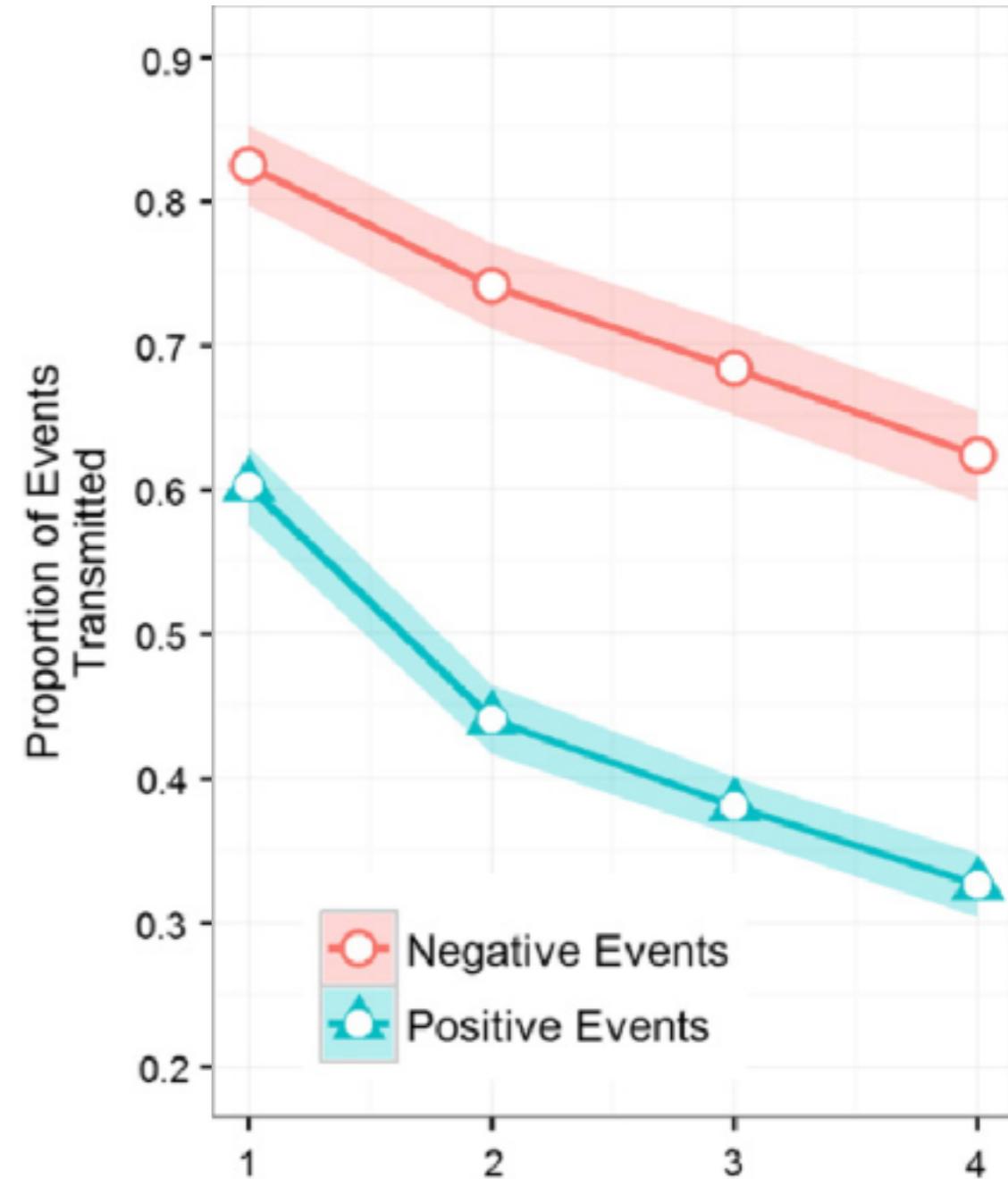


Cognitive attraction and online misinformation

- an illustrative/exploratory investigation:
- content analysis of 260 articles from “suspect” websites (lists provided by [snopes.com](#) and [buzzfeed.com](#))
- articles coded for the presence/absence of specific features (cognitive attractors)
- relatively small sample, but we wanted to *read* the articles

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



Bebbington et al., 2017

Negative content

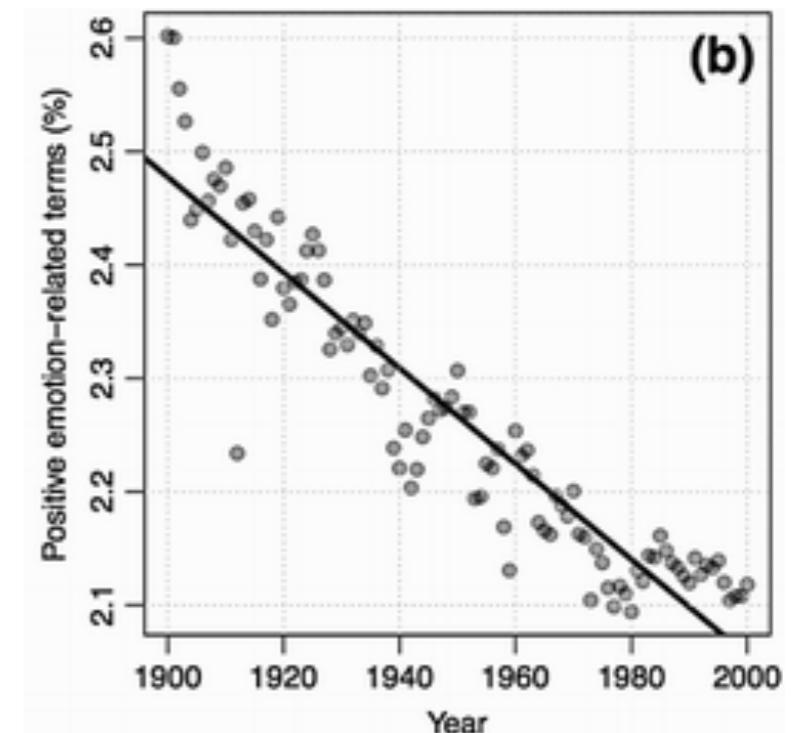
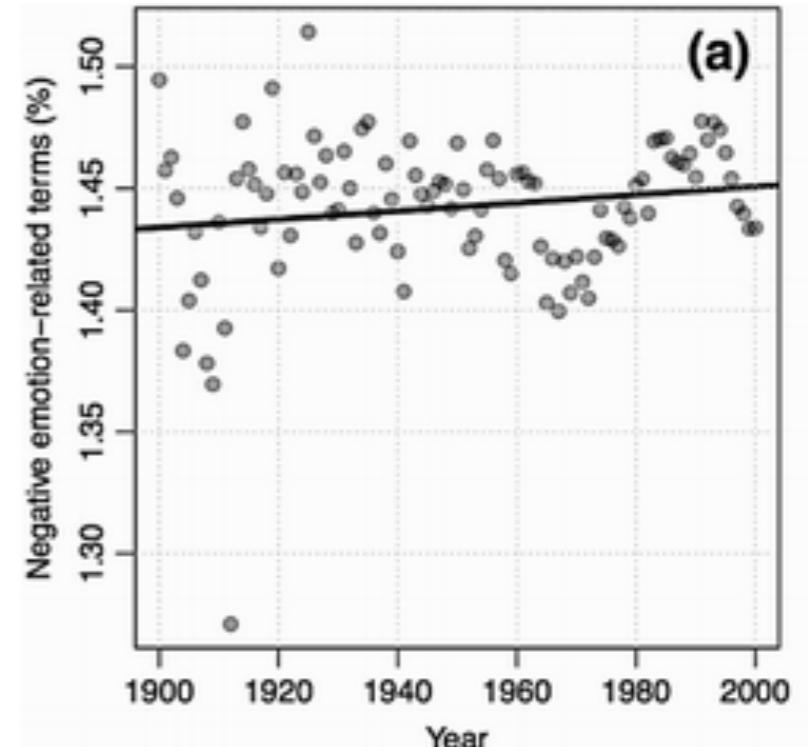
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When civil litigation cases go to trial, 60% of plaintiffs lose, winning no money

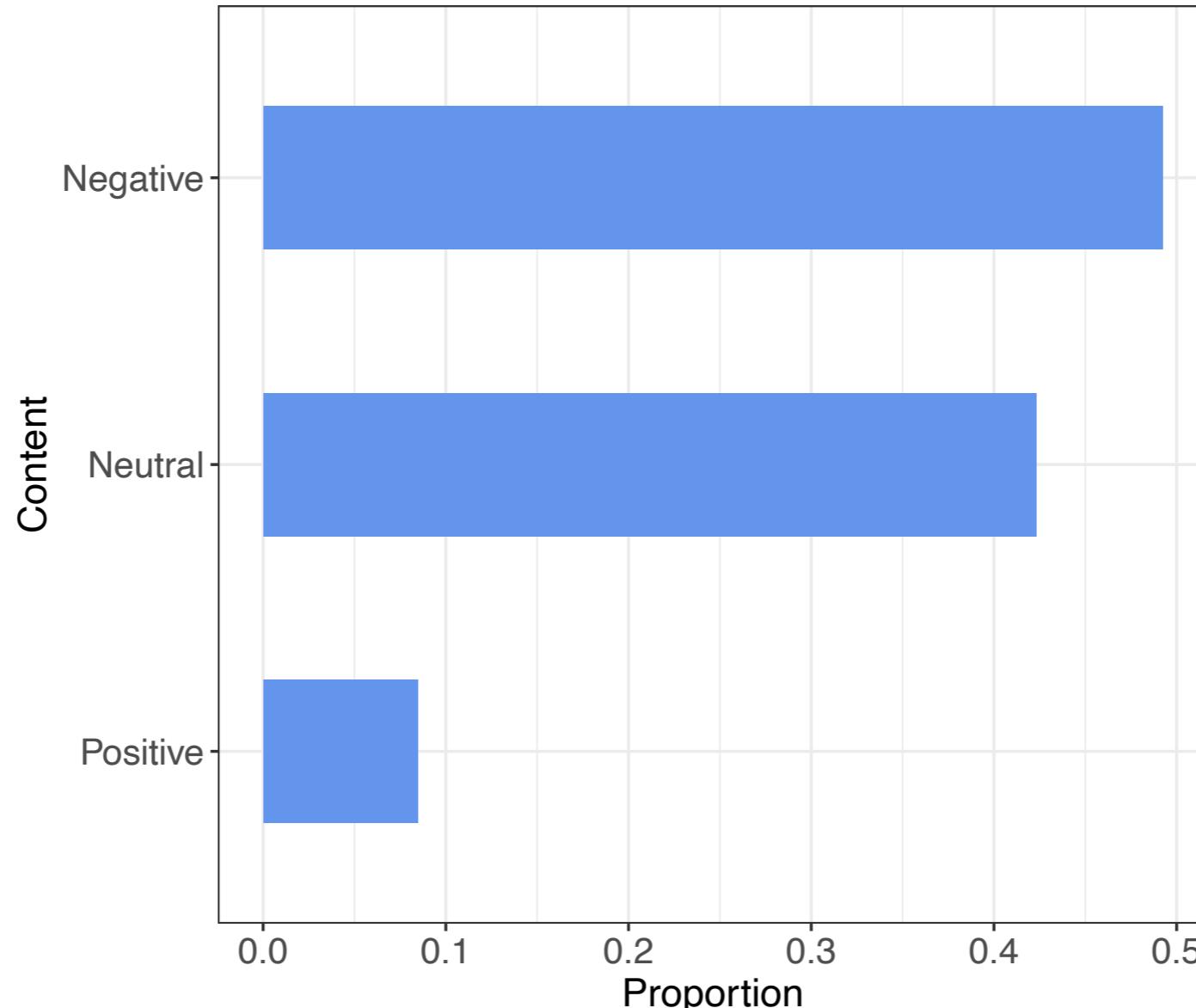
When civil litigation cases go to trial, 40% of plaintiffs succeed and win money

Negative content

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Negative content



- negative articles were between five and six times more frequent than articles with a positive content

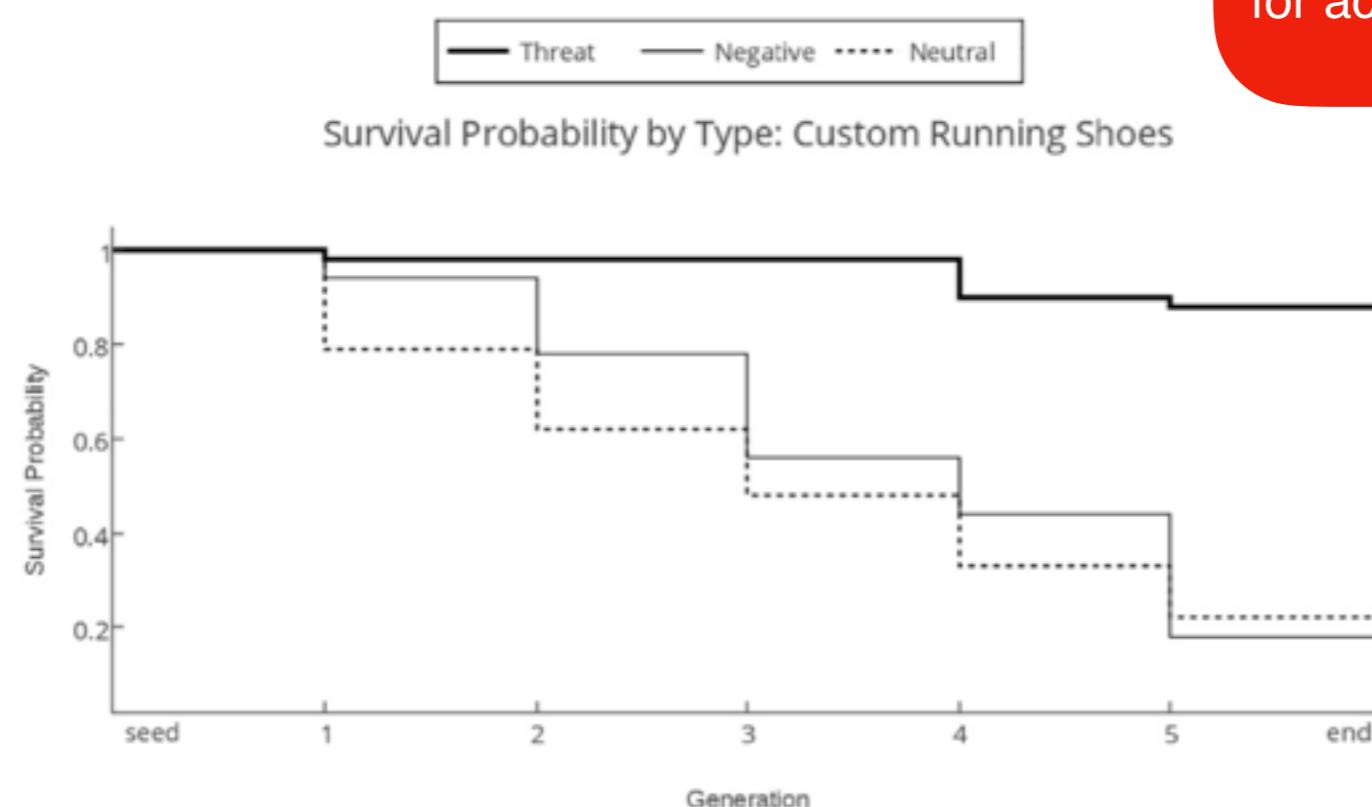
Threat-related information

- evolutionary explanation for negative information.

'Lancer™ special fabric may smell if not cleaned properly'

- The threat does not need to be relevant

'Lancer™'s strap design can cause sprained ankles when used for activities other than running'



Blaine & Boyer, 2018

Threat-related information

- evolutionary explanation for negative information.
- The threat does not need to be relevant

In 2% of users 'Lancer™'s strap design can cause sprained ankles when used for activities other than running'

MORGUE EMPLOYEE CREMATED BY MISTAKE WHILE TAKING A NAP

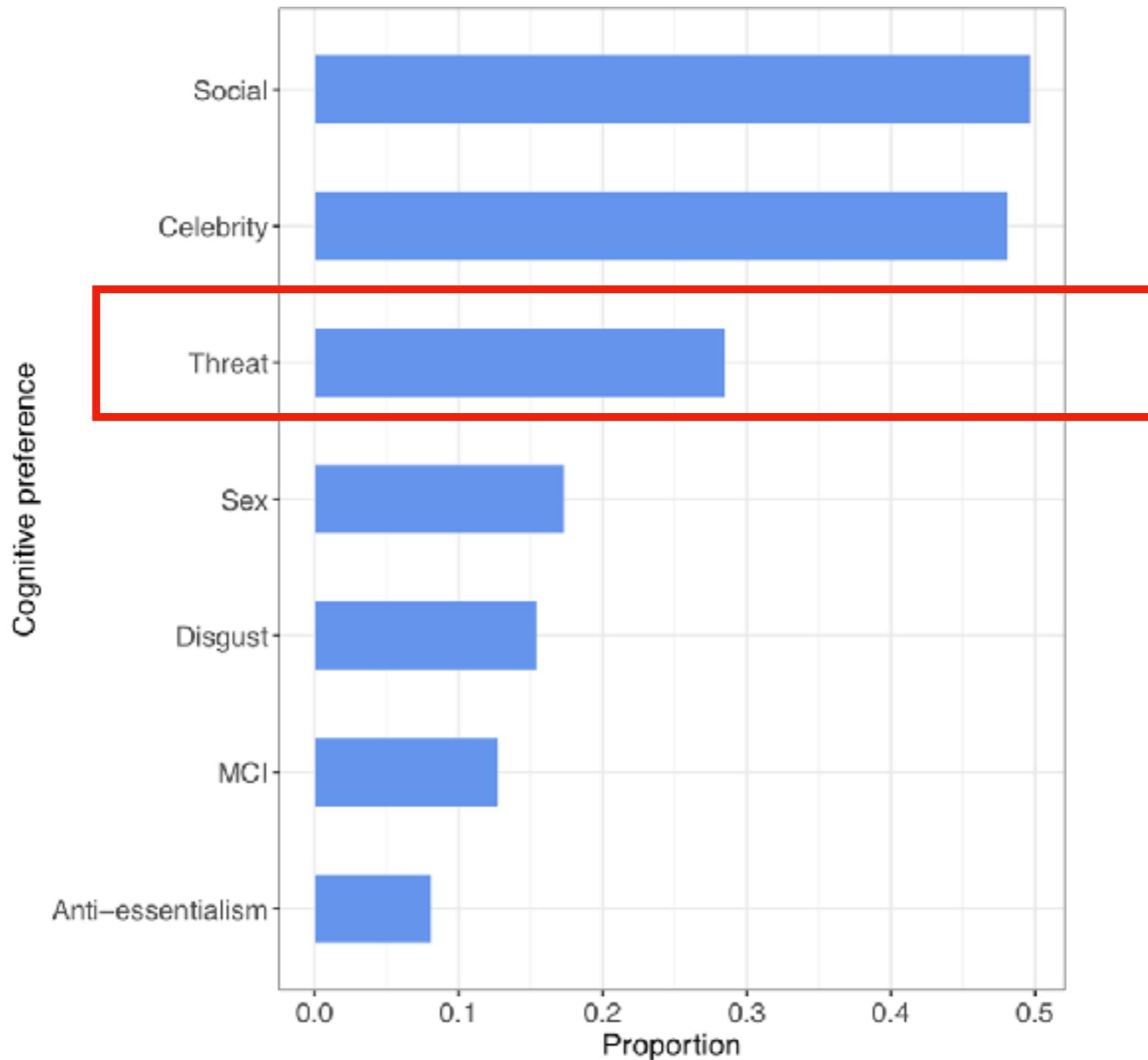


1M



Blaine & Boyer, 2018

Threat-related information



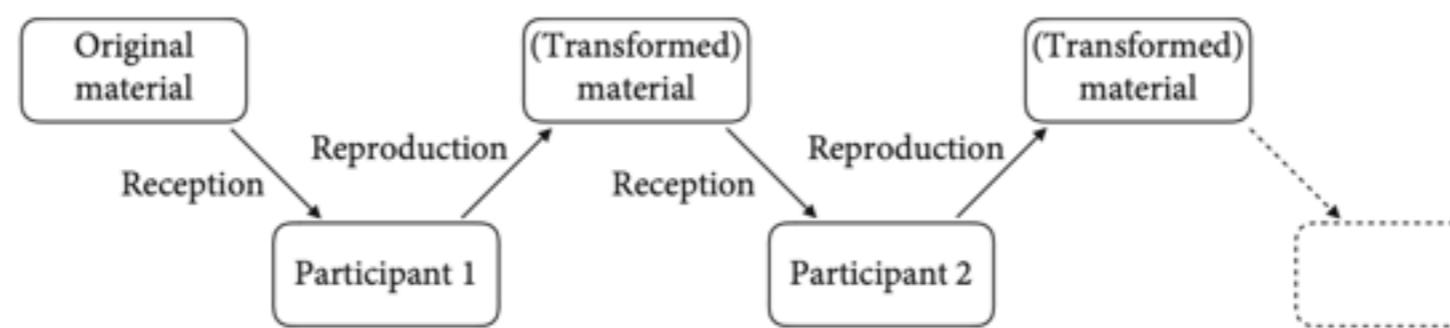
Cognitive attraction and online misinformation

- Misinformation is **low-quality** information that spreads because of **inefficiency** of digital communication
- quality = **truthfulness**
- Misinformation is **hi-quality** information that spreads because of **efficiency** of digital communication
- quality = **cognitive appeal**

Cognitive attraction and online misinformation

(Work in progress)

- Compare fake VS real news
- Automatic extraction of content
- Transmitting VS sharing



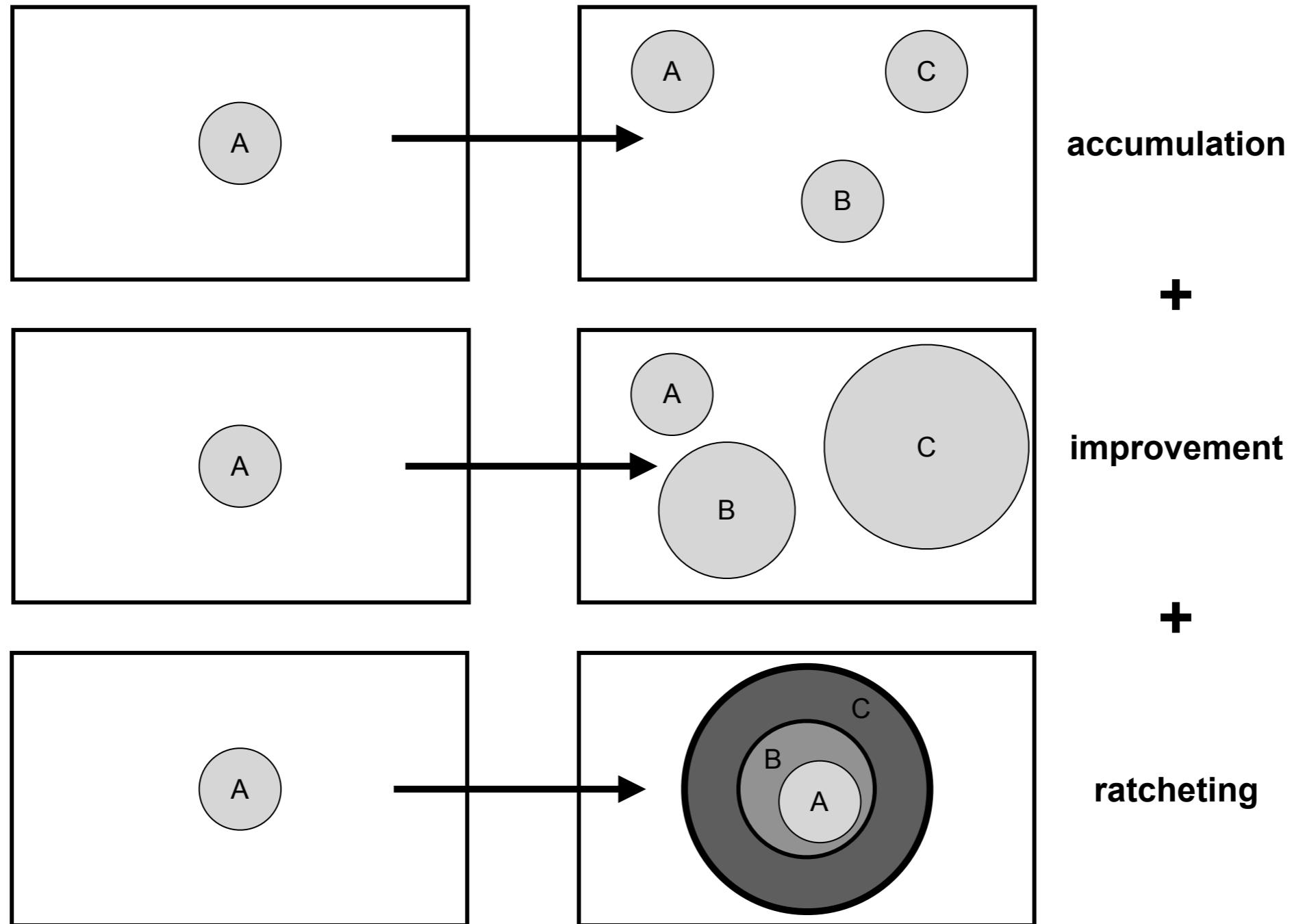


Cumulative
cultural
evolution
online

Cumulative culture



Cumulative culture

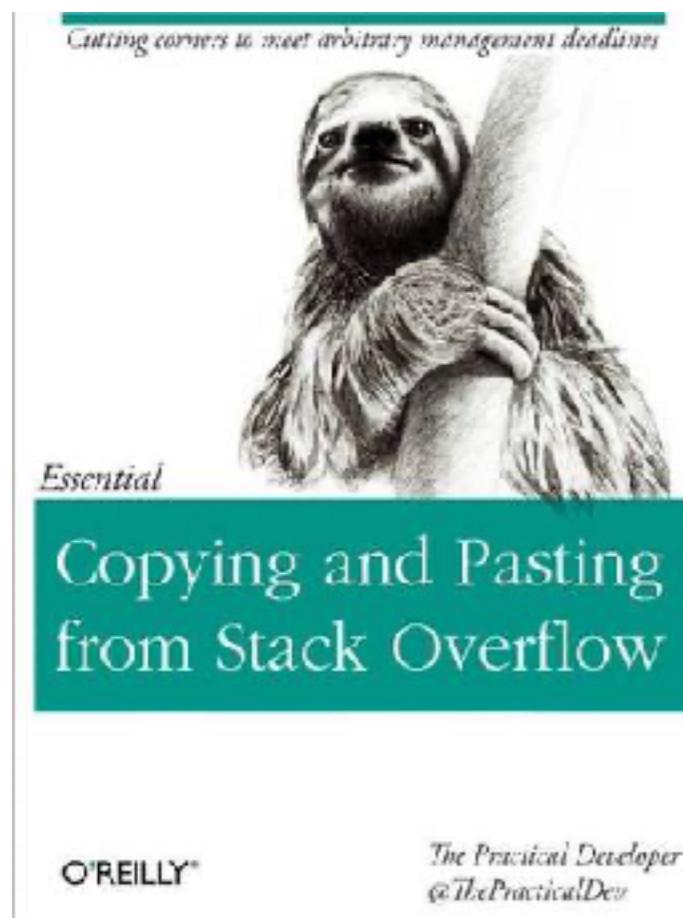


Cumulation depends on availability

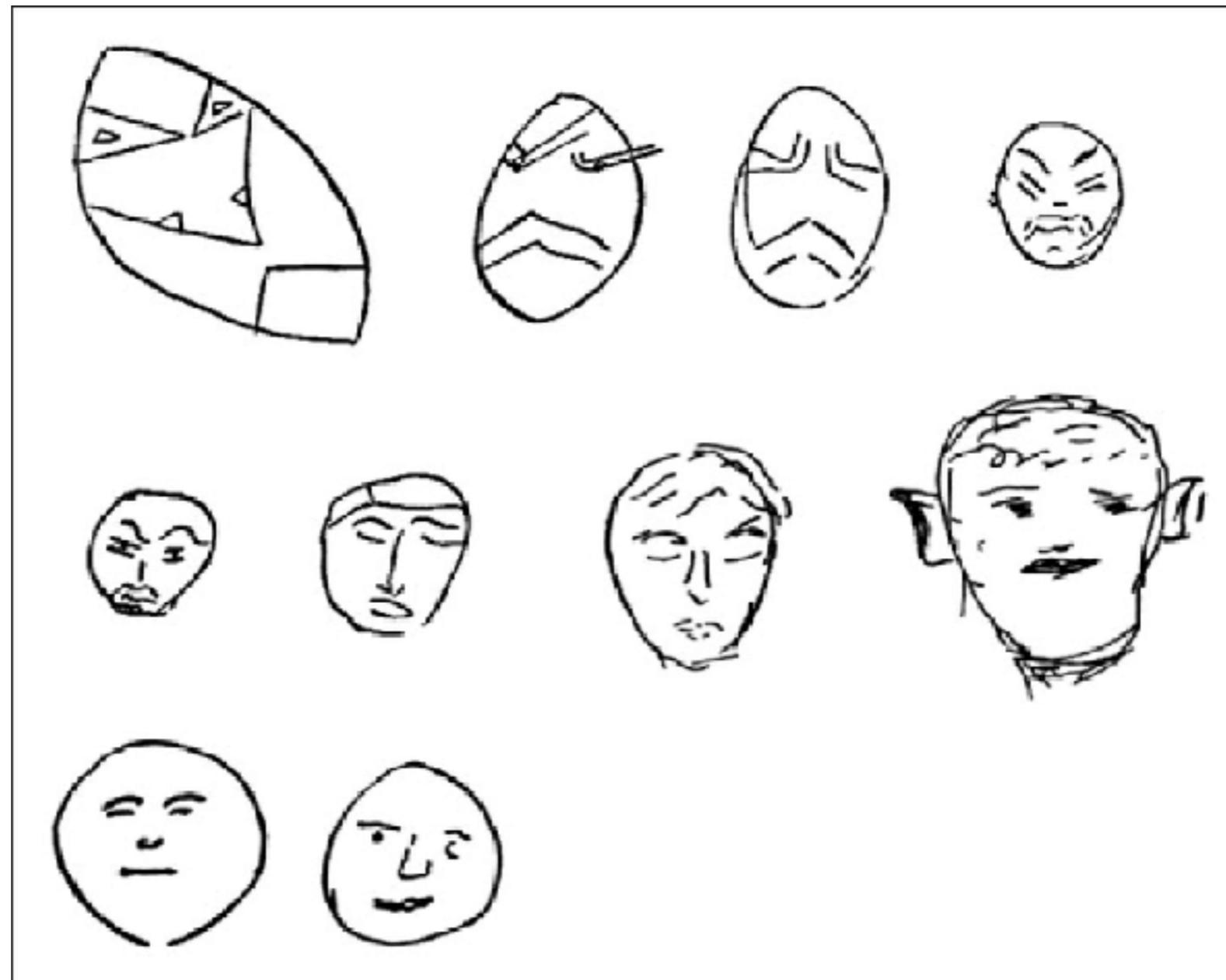


Henrich, 2014

The web provides hyper-availability



Cumulation depends on fidelity of transmission



Bartlett, 1926

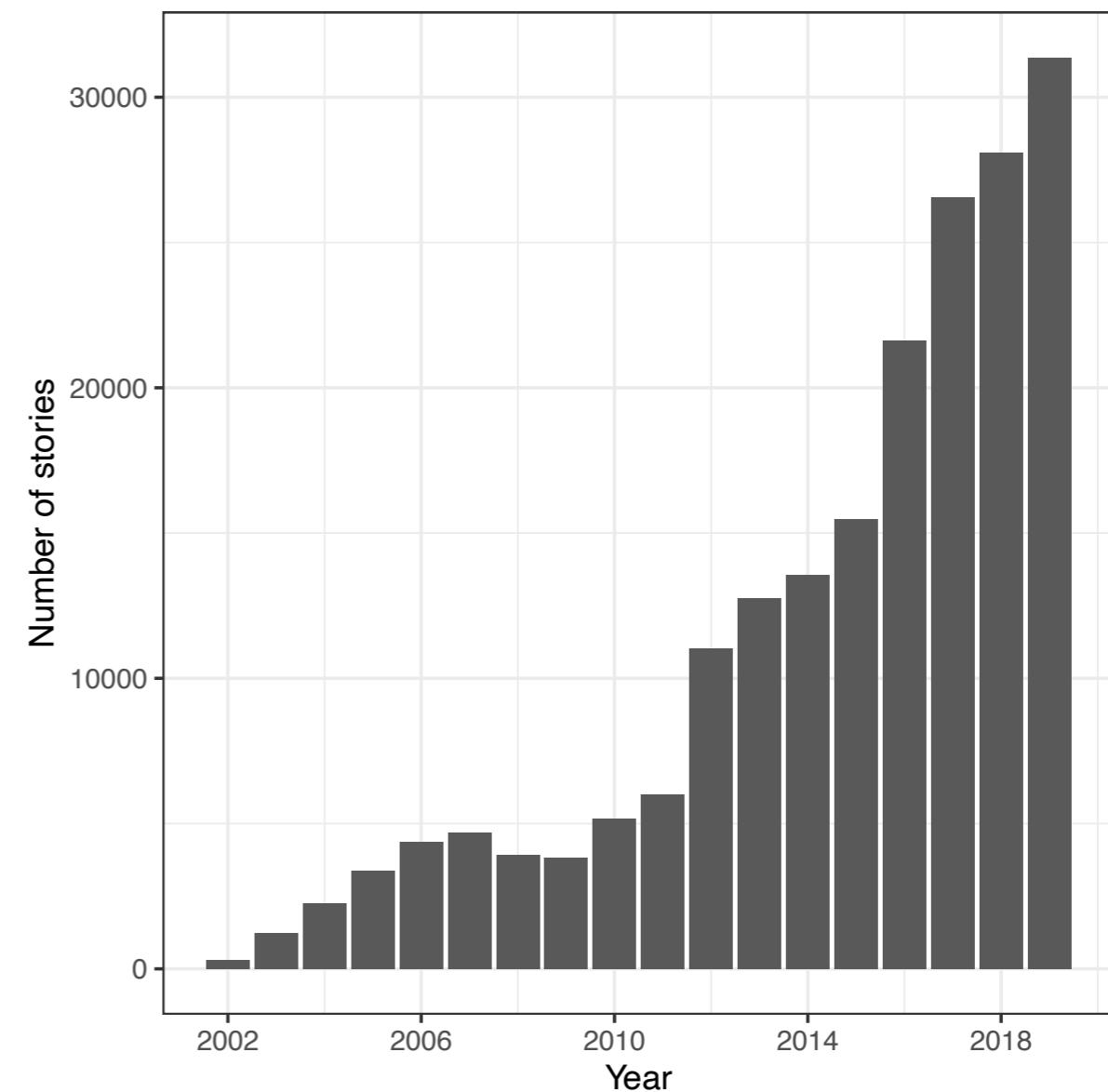
The web increases fidelity



- Do digital online media increase cultural cumulation (possibly in domains where it was limited before)?

Cultural cumulation in online fan fiction

- Harry Potter fan fiction - data from <https://archiveforum.org>



Cultural cumulation in online fan fiction

- Harry Potter fan fiction - data from <https://archiveforum.org>

Stats:

Published: 2014-01-01 Completed: 2018-11-28 Words: 2300260 Chapters: 354/354 Comments: 125 Kudos: 595
Bookmarks: 82 Hits: 143340



Ascension Book 2: Eternal

megamatto9

Summary:

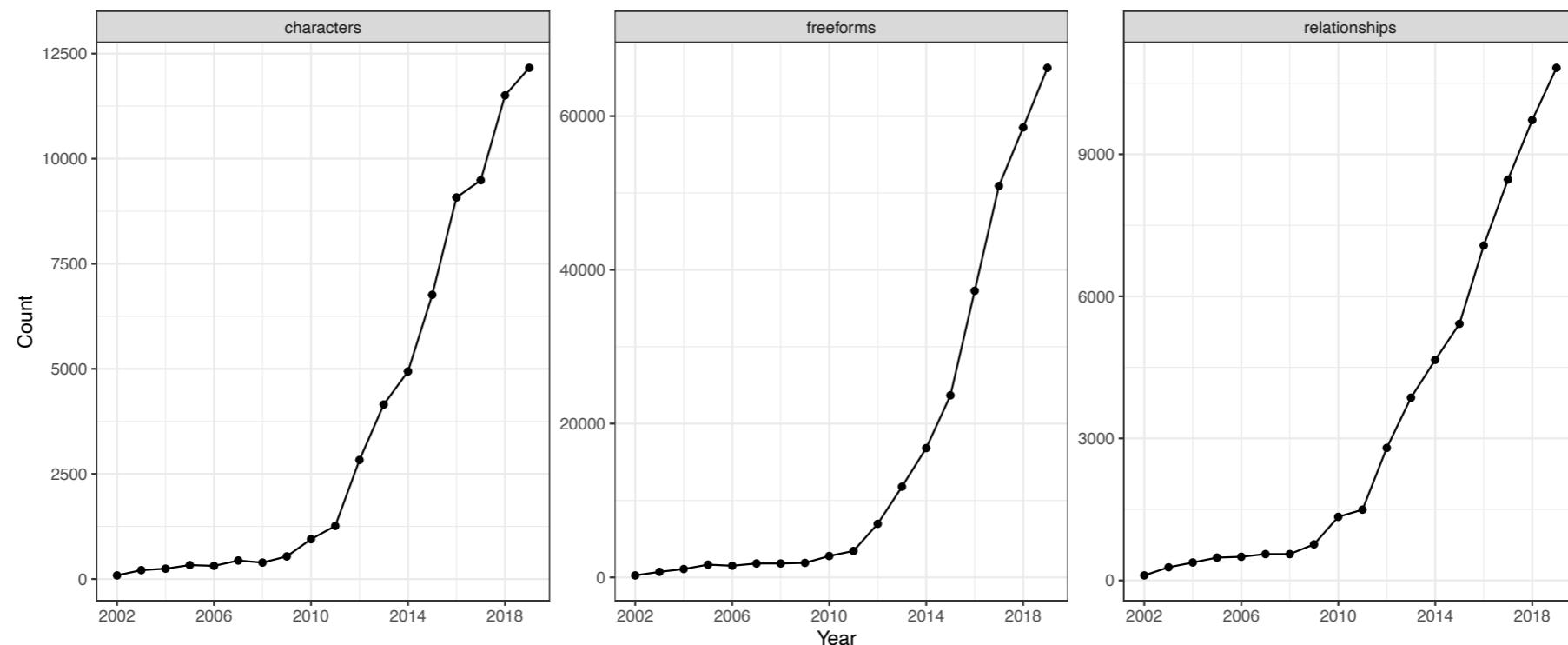
Set two years after Book One, the rise to the top continues for Harry Potter as new challenges, new allies, and new women are brought before him. Harry/Kara/Karen/Faora/Diana/Multi.

https://en.wikipedia.org/wiki/List_of_longest_novels

Book title	Author	Edition/publisher	Page count	Volumes	Page size	Word count	Language	Notes
<i>Devta</i>	Muhiyyu-d-Deen Nawaab	Suspense Digest	8,128	56		11,206,310	Urdu	Started in 1977 and ended in 2010 (33 years)
<i>Venmurasu</i>	Jeyamohan	Natrinal/Kizhakku	22,400	26 [5][6][7][8][9][10][11][12][13][14][15][16][17][18]	8.25 inches (21.0 cm) x 5.85 inches (14.9 cm)	3,640,000 (as of June 2020)	Tamil	A novel based on <i>Mahabaratham</i> , approximately 25,000 pages, completed in July 2020 in 26 volumes.
<i>A Chronicle of Ancient Sunlight</i>	Henry Williamson	Macdonald, 1951-1969	6,062	15		2,436,924	English	
<i>Les Hommes de bonne volonté</i>	Jules Romains	Groupe Flammarion	7,892	27		2,070,000	French	English title: <i>Men of Good Will</i>
<i>Artamène ou le Grand Cyrus</i>	Georges and/or ^[19] Madeleine de Scudéry	Augustin Courbé, 1649–53	13,095	10 [20]		1,954,300 ^[21]	French	
<i>Het Bureau</i>	J. J. Voskuil	Van Oorschot, 1996-2000	5,058	7	7.85 inches (19.9 cm) x 4.95 inches (12.6 cm)	1,590,000 ^[22]	Dutch	
<i>Gordana</i>	Marija Jurić Zagorka	Školska knjiga, 2007	8,768	12 [23][24][25]		1,400,000 (estimated)	Croatian	The longest Croatian novel.
<i>À la recherche du temps perdu</i>	Marcel Proust	Gallimard (Collection Folio edition, 1988–1990)	3,031	7 ^[26]	7 inches (17.8 cm) x 5 inches (12.7 cm) ^[27]	1,267,069 ^[28]	French	Guinness World Record holder for longest novel. Uses estimated character count of 9,609,000 ^[29]

Accumulation

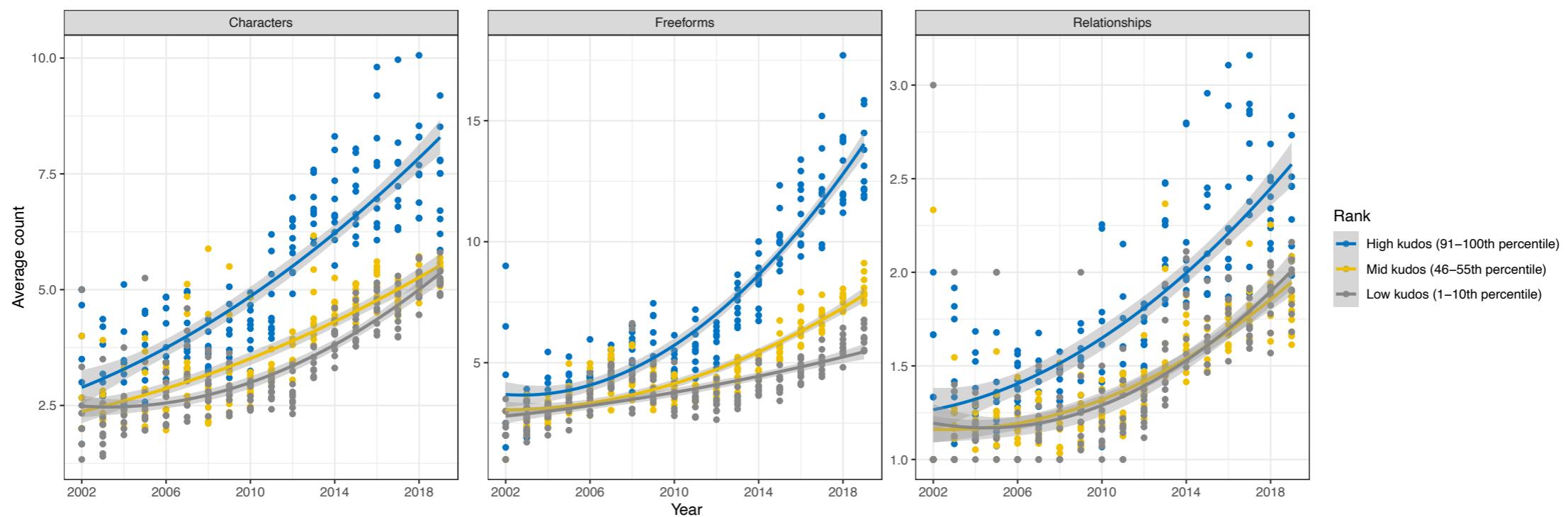
- Working not on the text (so far) but on metadata (e.g. tags, “kudos”, etc.)
- Are stories getting more complex? (Tags as proxy)



The total number of unique tags increases in time

Accumulation

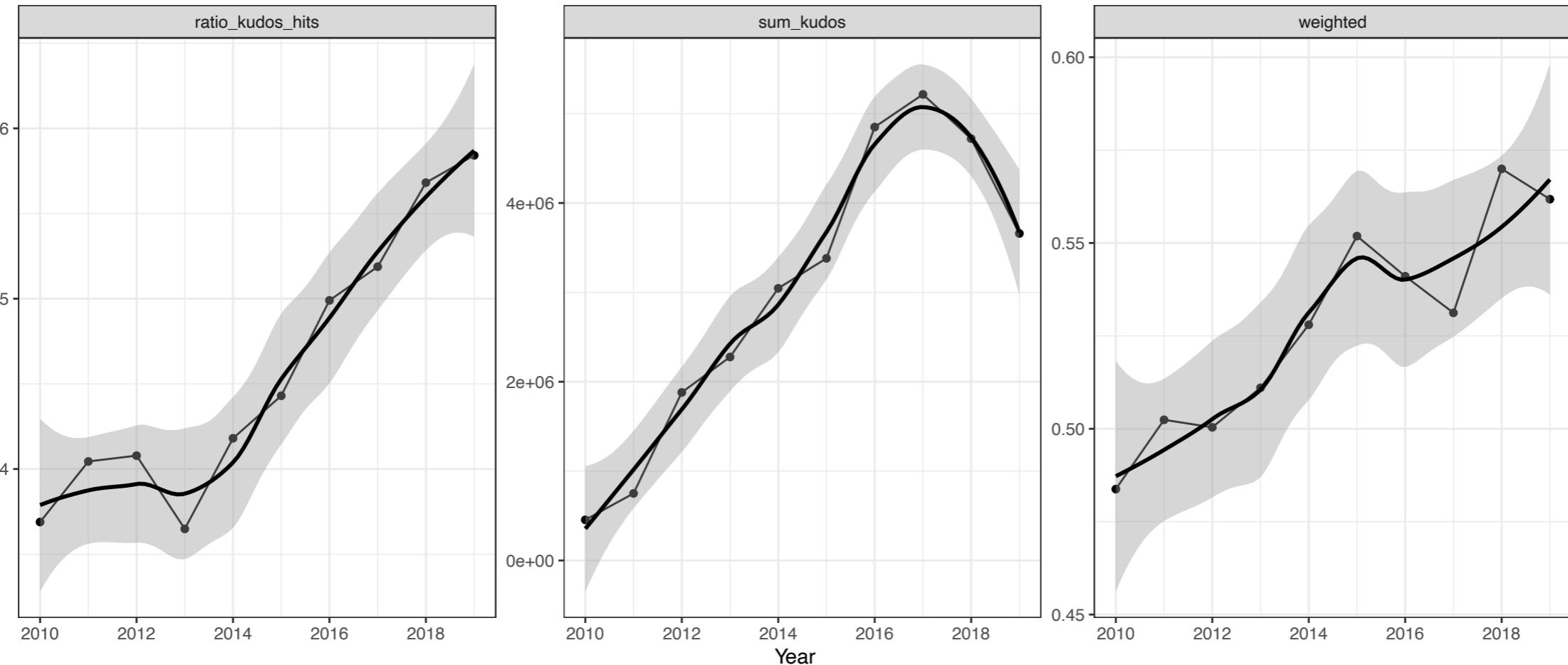
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The number of unique tags **per story** increases in time

Improvement

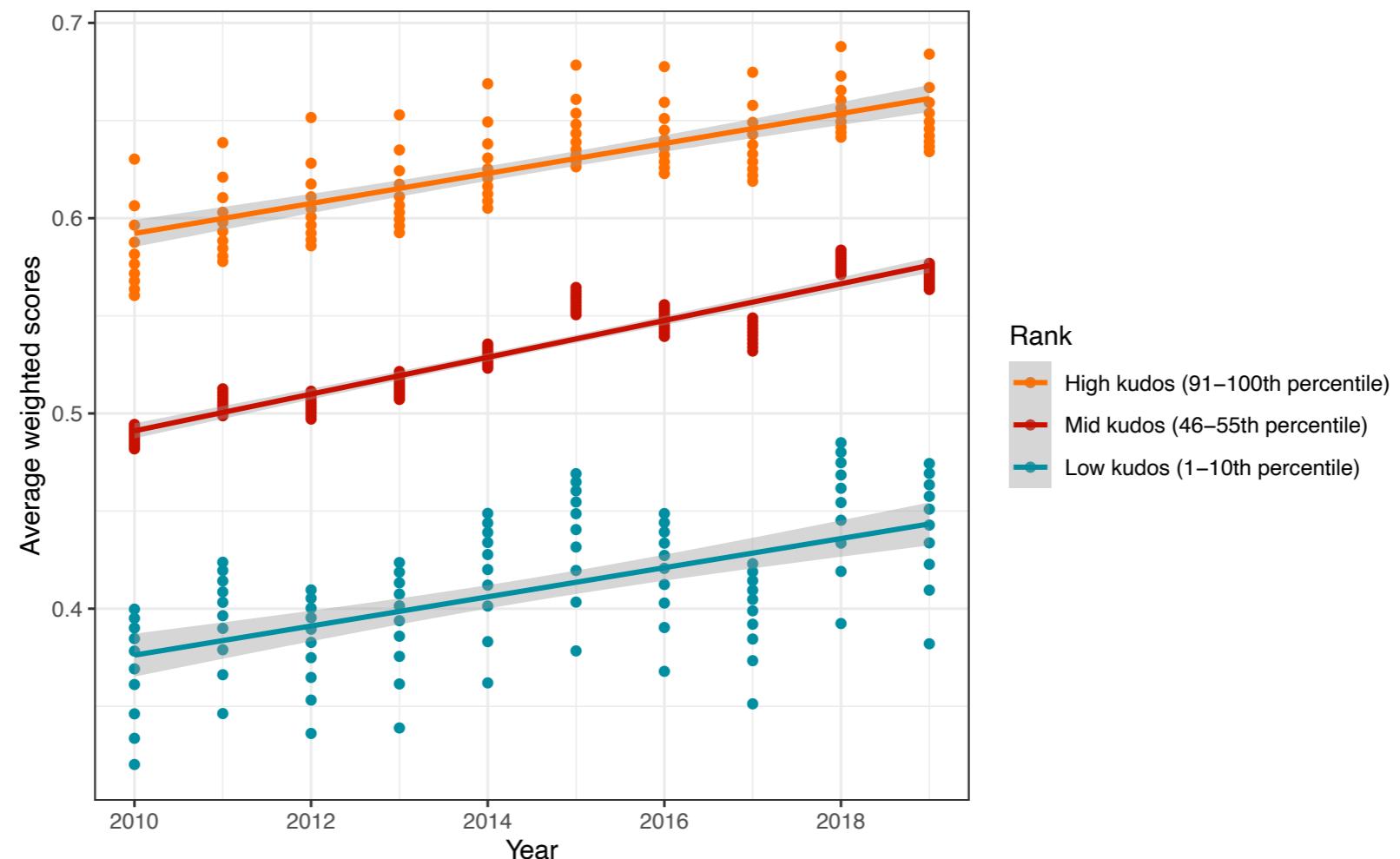
- Are stories getting “better”? (As measured by kudos)



The total number of kudos increases in time

Improvement

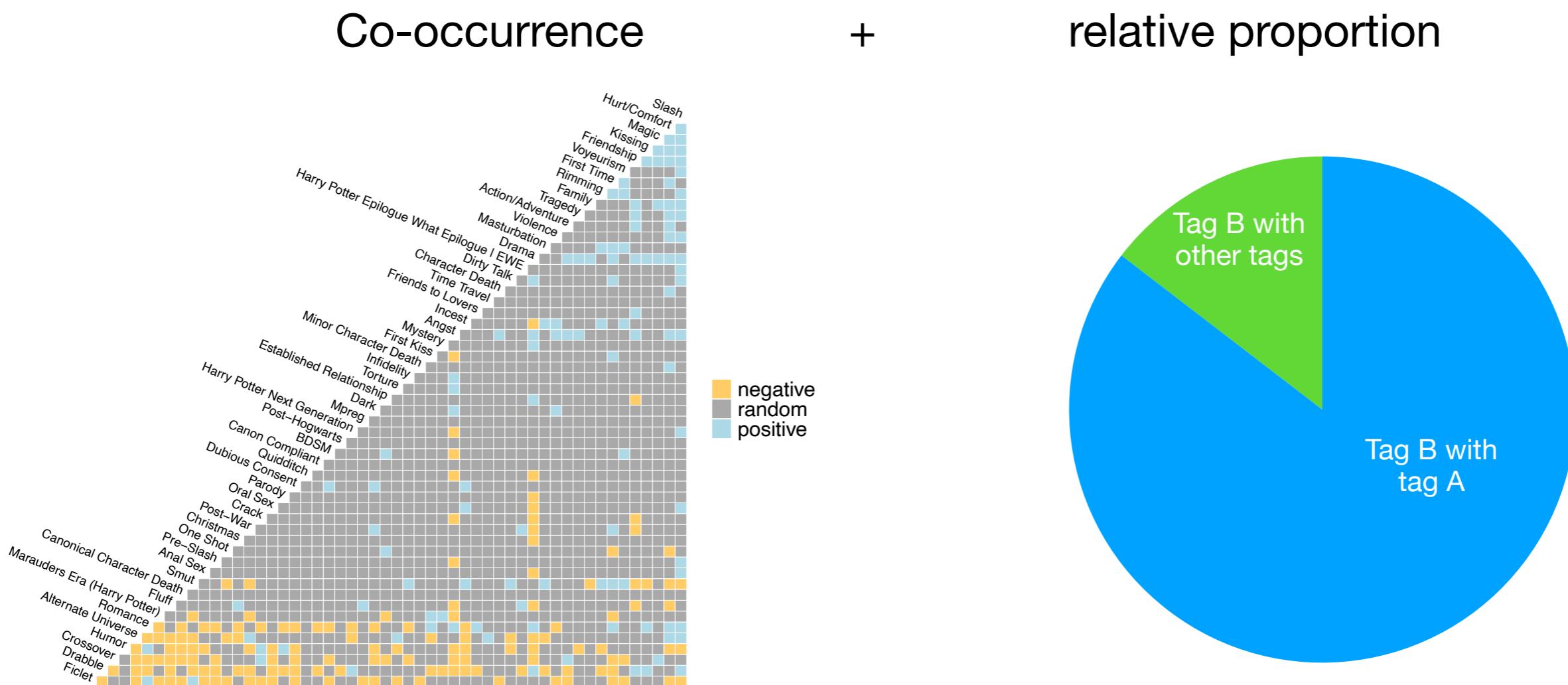
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Ratcheting

- Introduction of a new tag B is allowed (or facilitated) by the presence of the tag A .



Cultural cumulation in online fan fiction

- Measuring cumulation in online social media, using concepts from cultural evolutionary theory
- Availability plus fidelity of transmission can boost cumulation

Conclusion

- Cultural evolution as a promising framework to study the effects of digital online media
- Online misinformation: *why* do we share it? Cognitive factors are important (misinformation as high quality information that spreads because of the efficiency of online media)
- Cumulative cultural evolution online. Digital online media provide hyper-availability and cheap fidelity of transmission. Does this improve cultural cumulation?



THANK YOU!

- Pianzola, Acerbi, Rebora (2020) Cultural accumulation and improvement in online fan fiction, *Computational Humanities Research 2020 Conference*.
- Acerbi (2020) *Cultural evolution in the digital age*, Oxford University Press
- Acerbi (2019) Cognitive attraction and online misinformation, *Humanities and Social Science Communications*, 5, 15.
- Acerbi (2016) A cultural evolution approach to digital media, *Frontiers in Human Neuroscience*, 10, 636.



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