

Effects of Misinformation on Online Discussions

MISDOOM 2024

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WORK IN PROGRESS

Misinformation and emotions

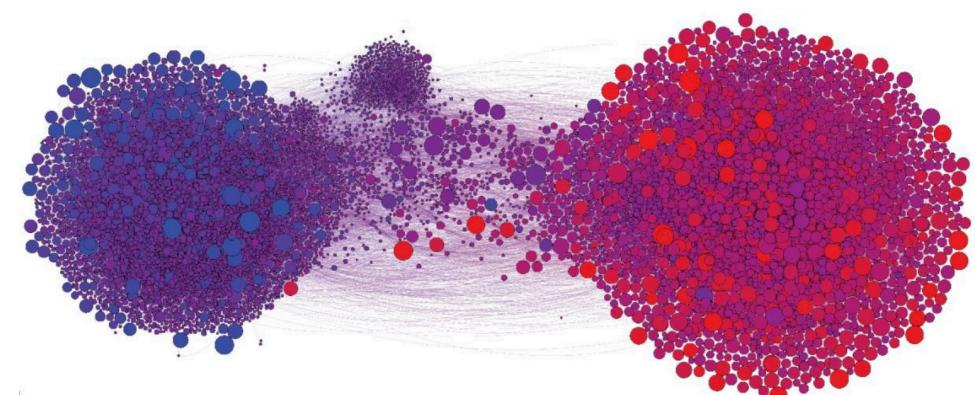
Misinformation
is a symptom of
partisan
information
ecosystems

Arousing
emotions
reinforce
partisan-based
information
processing

Misinformation on social media

Collective dynamics online

- Moralizing and arousing content gets high engagement
- Misinformation is often negative and conflict-laden
- **But it is a contained problem and we lack causal evidence**
 1. only 0.3–6% in 5 studies from 2016–2021 (less incl. all media)
 2. mostly elite and ordinary partisan superspreaders
 3. connected to hate speech and inter-group conflict



Nikolov et al., 2021

**What are effects of
misinformation on online
discussions?**

Problems

1. Misinformation is often measured as clearly true or false instances,

- neglecting less extreme types,
- making it hard to isolate effects of misinformation.

2. Different effects of emotions are overlooked

- by measuring positive and negative sentiment only,
- mixing up emotional reactions with prior state, stimuli, etc.,
- ignoring the function of emotions.

Our objectives

1. Collecting a **systematic, large-scale and long-term data set** for the German-speaking context

Continuous trustworthiness ratings by NewsGuard (#1)

2. Approximating **causal inference** to test the effects of misinformation on emotions

Nonparametric matching strategy (#2)

Data collection

Posts from Twitter/X
mentioning any of 347
German news domains

$N = 20.6M$ tweets

- 9.3M discussions incl. 0 replies
- 1M discussions excl. 0 replies

→ 93.8% trustworthy (>60)



DER SPIEGEL ✨ @derspiegel · 11h

Dem Sohn von US-Präsident Joe Biden, Hunter, droht nach dem Schulterspruch vor einem Bundesgericht eine Haftstrafe. Für den Vater gibt es in der ganzen Affäre nur einen kleinen Lichtblick.



(S+) Hunter Biden: Urteil gefällt - dunkle Stunde für den Biden-Clan

From spiegel.de



15



3



7

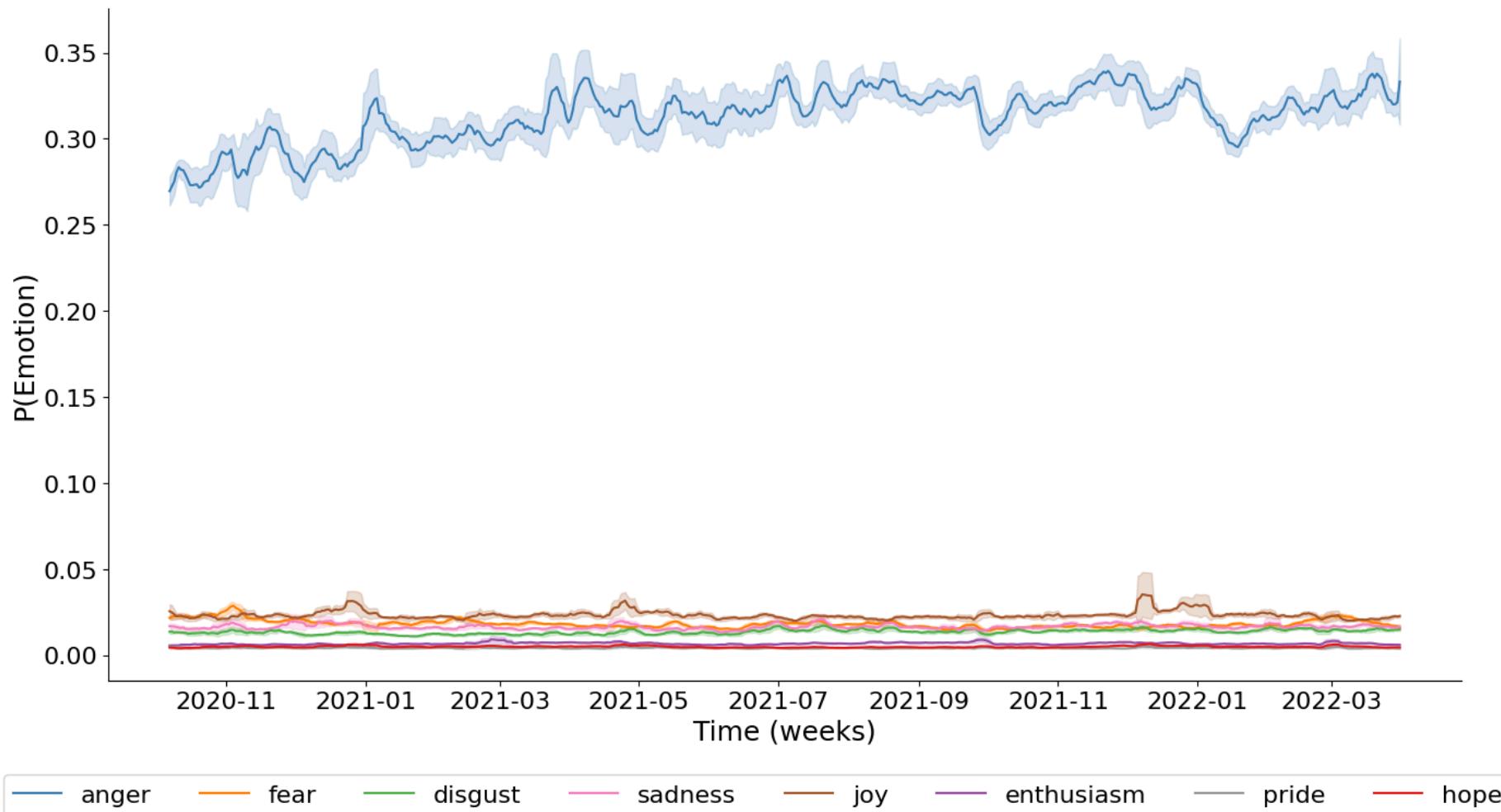


11K



...

Machine learning classification



Basic emotions, pride and hope (macro F1 = 0.67)

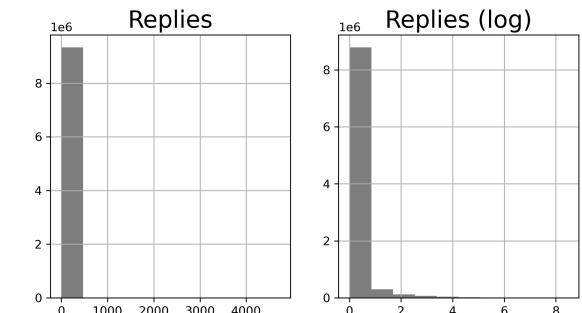
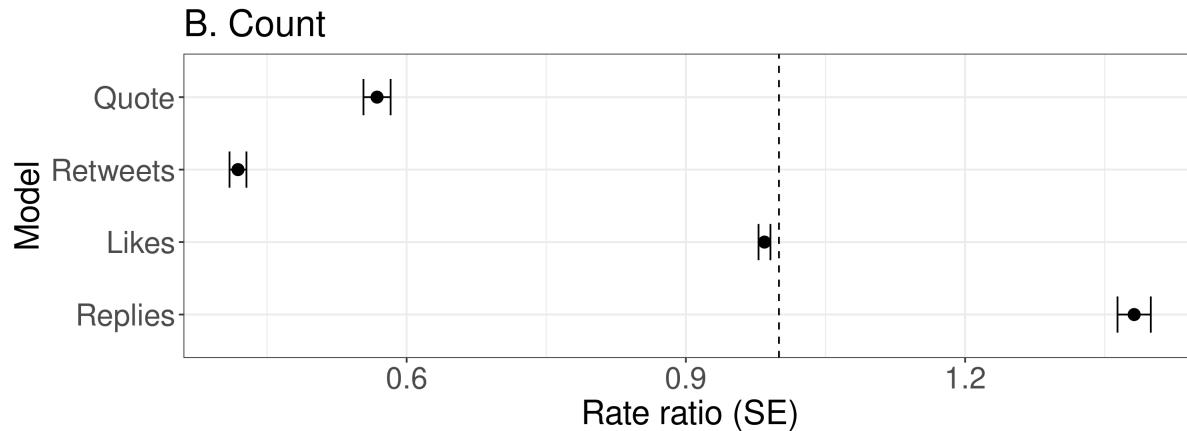
A) Correlations

Part I: Engagement

Misinformation gets more reshares but less replies

Models: Zero-inflated Negative Binomial (log-link)

Controls: PO, word count, following, initial emotions

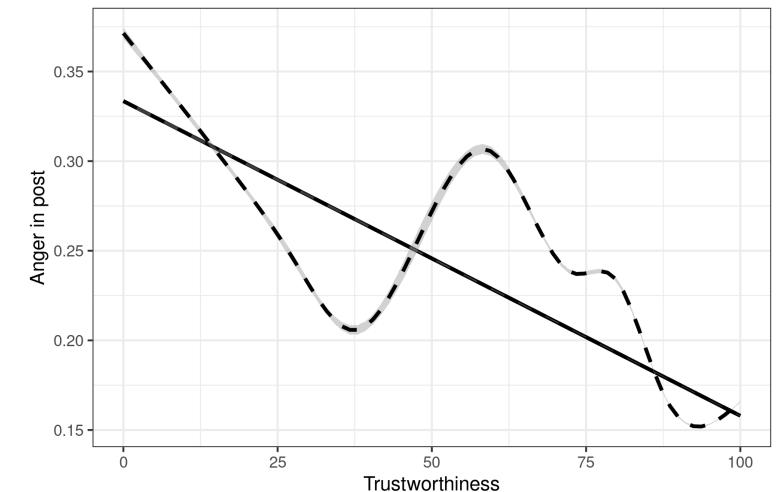
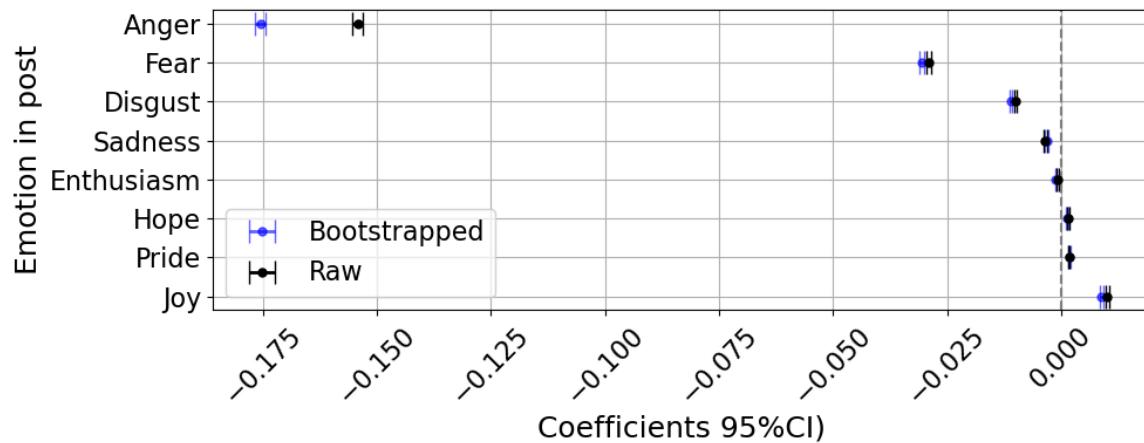


- 58% in retweets
- 43% in quotes

→ Misinformation gets less replies, i.e., less discussions

Part II: Emotion in the post

More negative emotions in misinformation



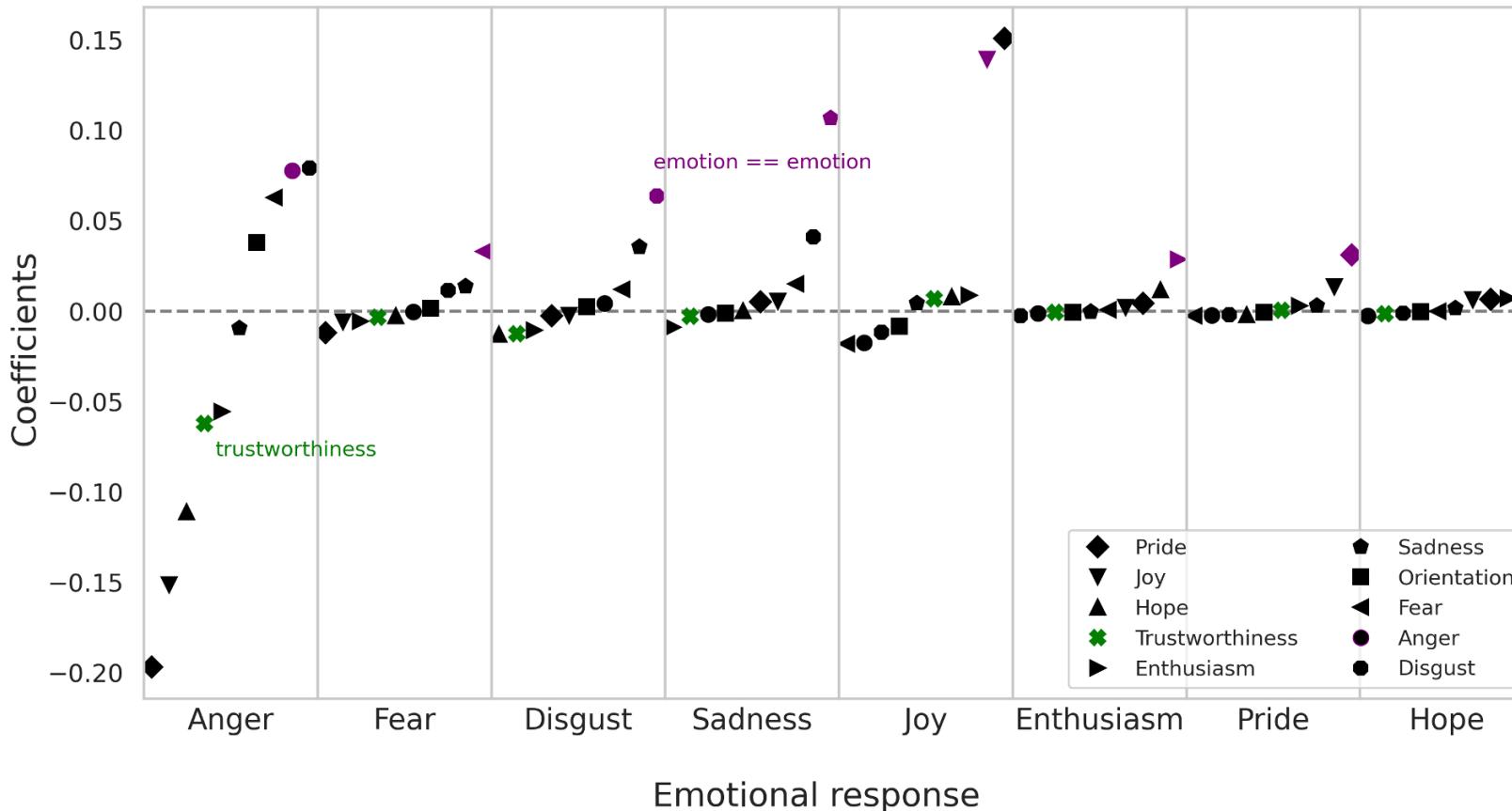
→ Trustworthiness predicts a 15% decrease in anger

But gray-area content matters, too!

Part III: Emotional responses

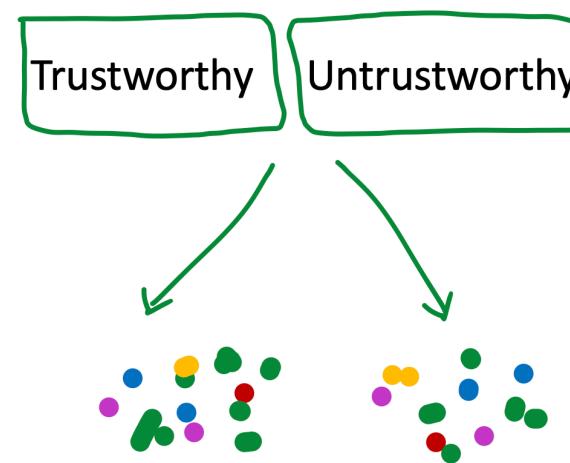
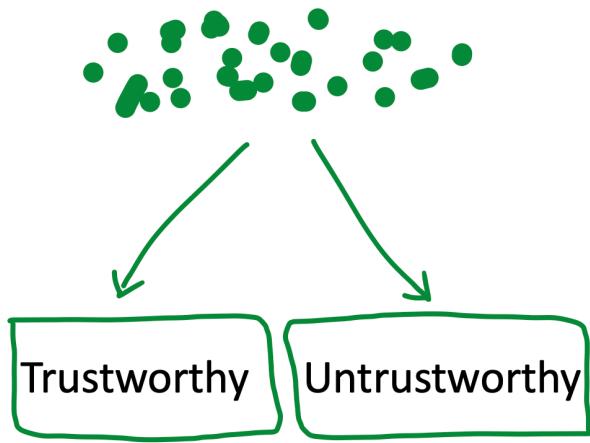
Emotional response reflects emotion in post

! ~1M discussions with 12M tweets (92% trustworthy)

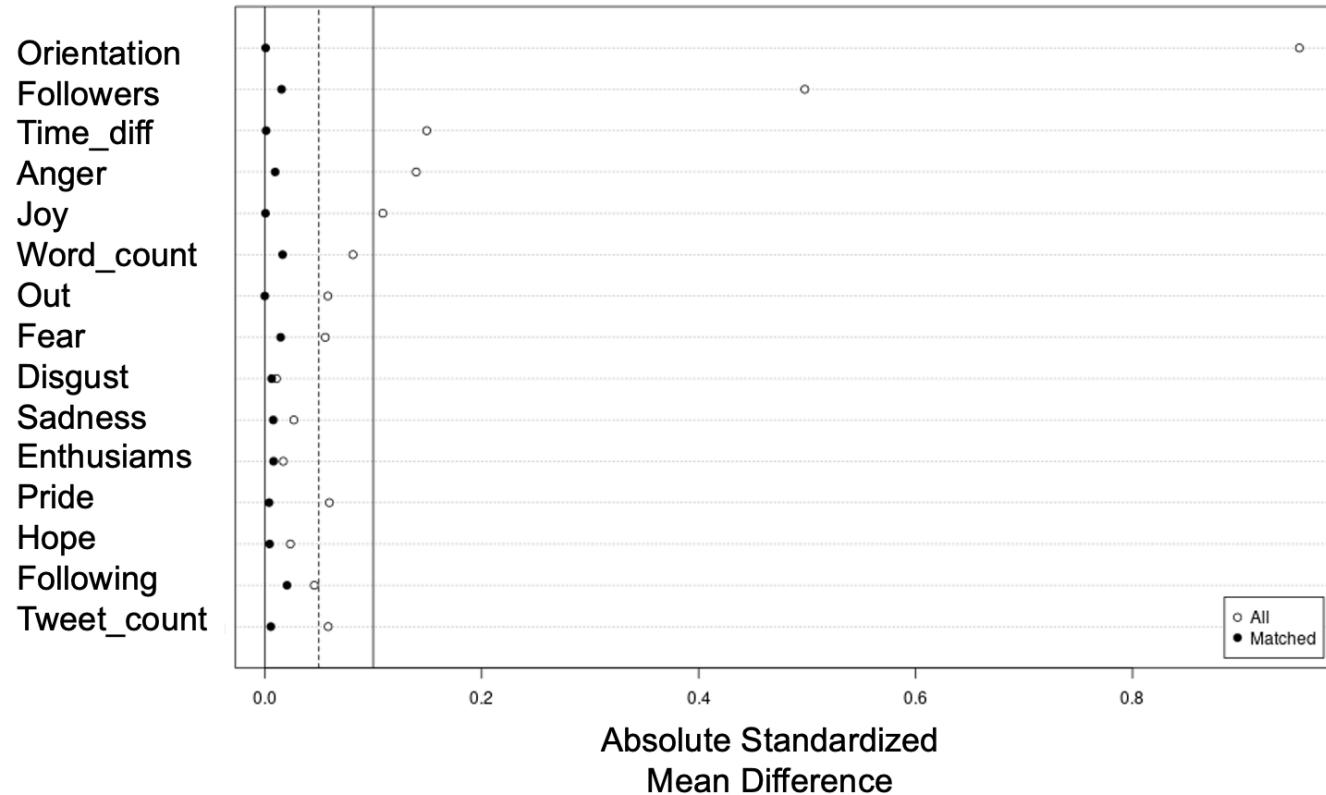


→ Does misinformation actually cause emotional reactions?

B) Causal inference



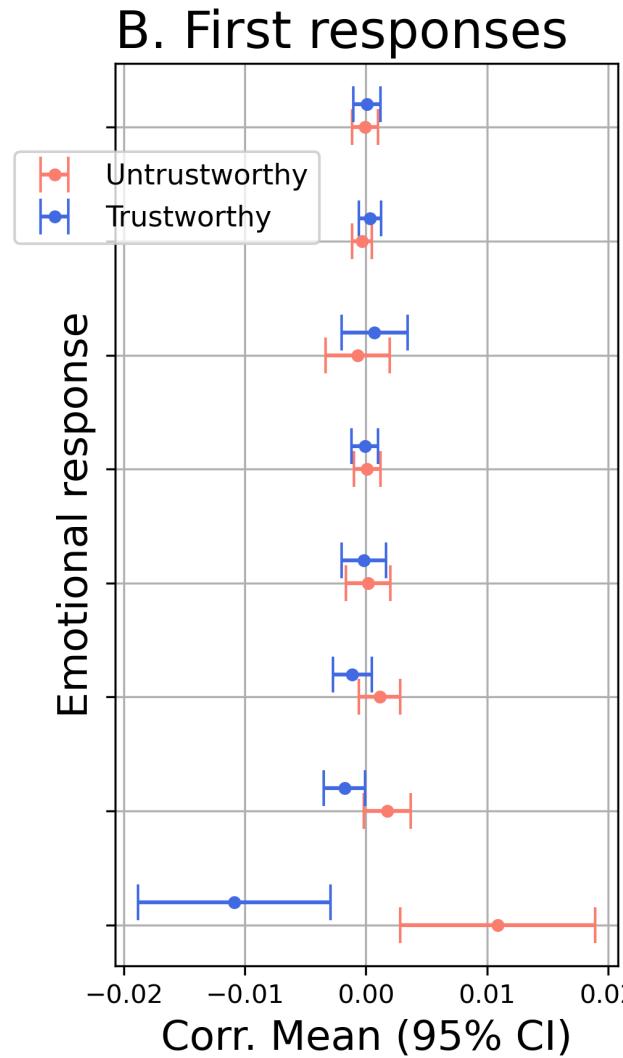
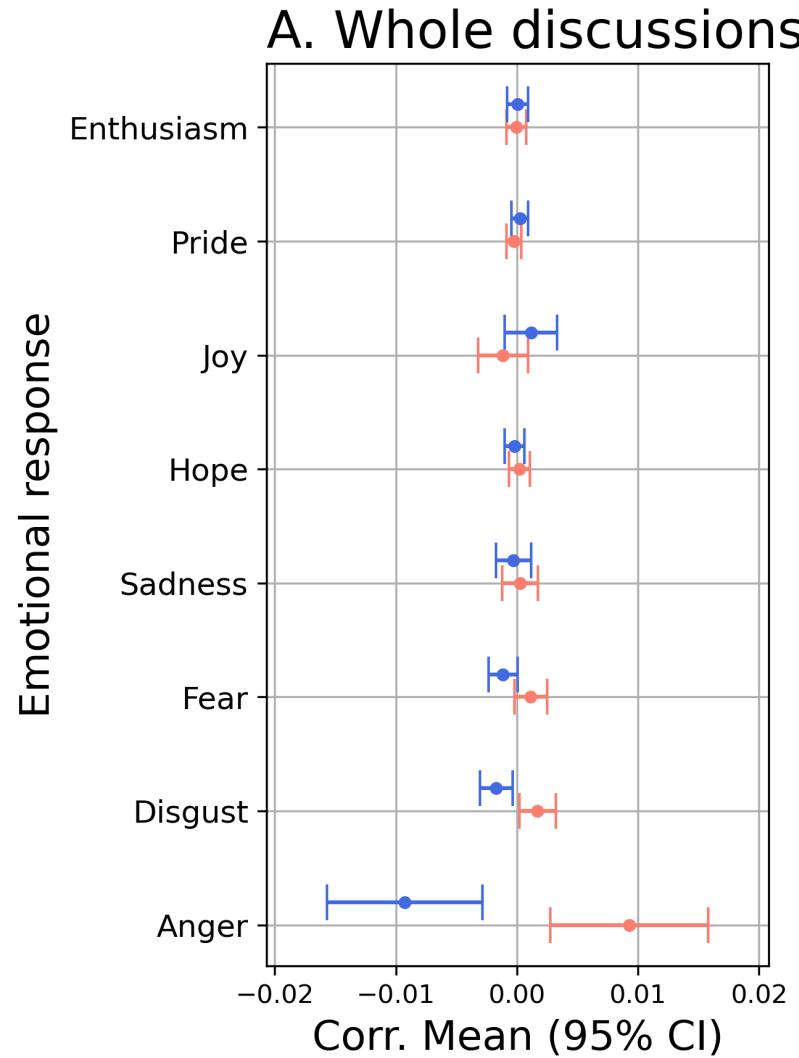
Non-parametric matching



Nearest Neighbor
and Mahalanobis
distance

→ $N = 87,132$

Does misinformation affect emotional responses?

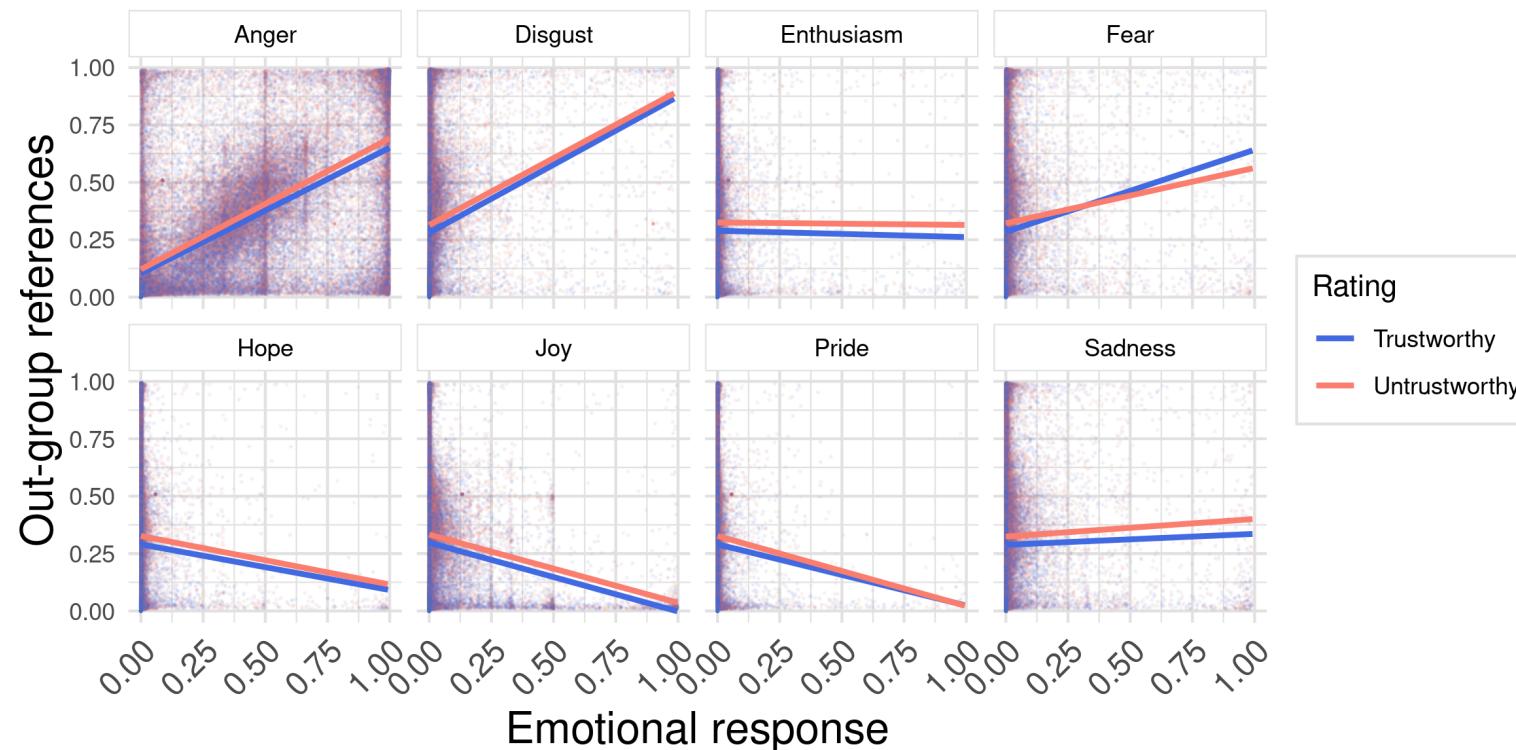


→ Less joy

→ 2% more
anger

C) Origin and direction of anger (TBD)

What happens in most angry discussions? What are the topics in the first post?

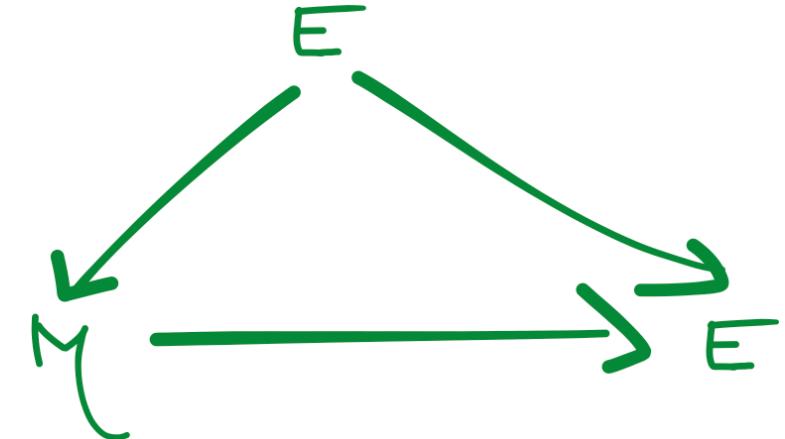


Out-group classification (Lasser et al., 2023; F1=0.8)

Conclusion (tentative)

What are effects unique to misinformation?

- Overall: trustworthy news prevails
- Misinformation causes anger
- Emotional reaction mirrors emotion in stimuli
- Misinformation is more angry



→ Not low trustworthiness is harmful, but hateful content
→ **Misinformation is not the cause – is it a tool?**

Thank you!

→ Pre-print coming soon!

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