

Spotting False News and Doubting True News: A Meta-Analysis of News Judgments

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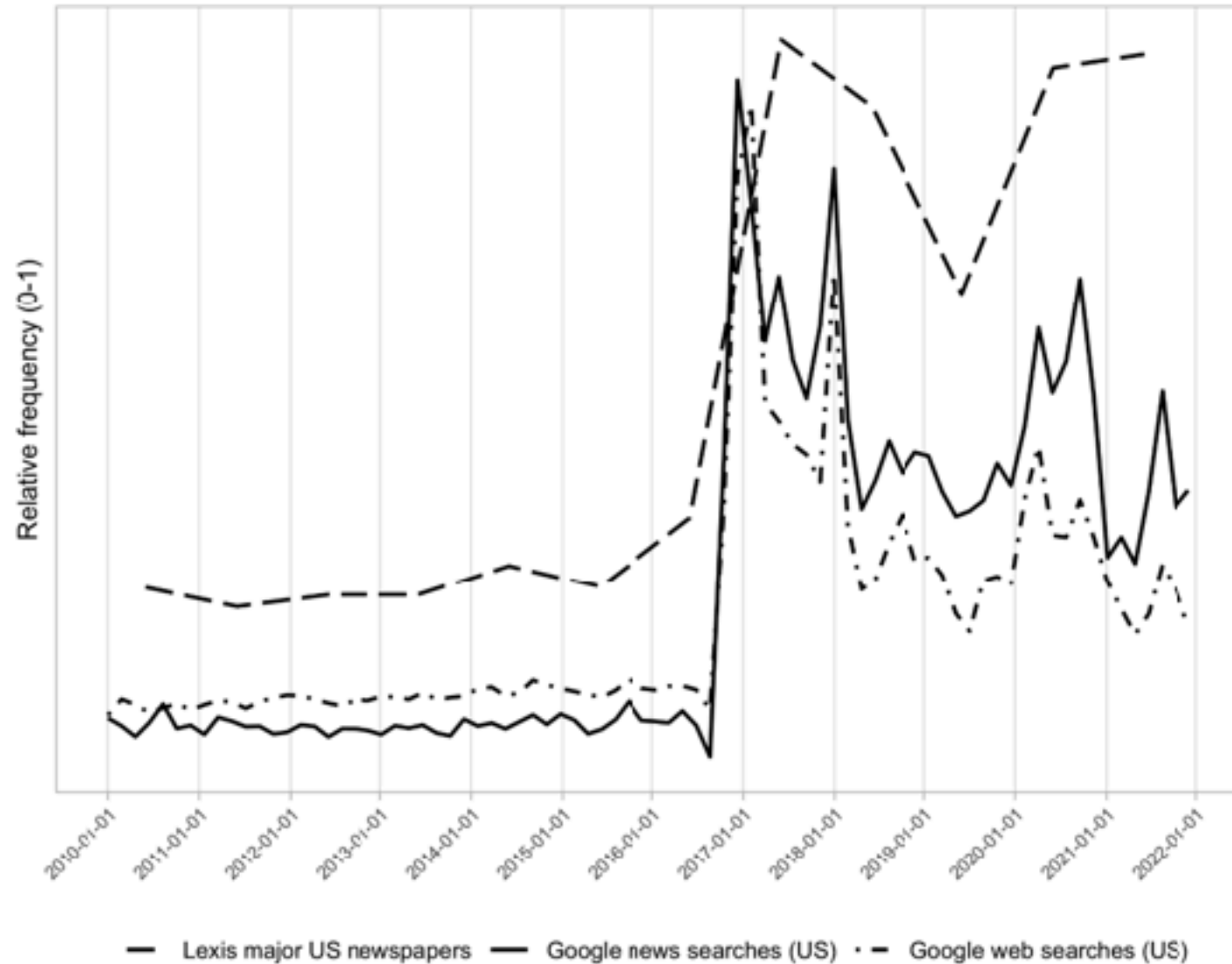
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Coverage of misinformation



Study of misinformation

Title of scientific articles (Google Scholar)

- **Misinformation * 3:**

70'900 articles between 2007-2015
220'000 articles between 2016-2024

- **Fake news * 49:**

5'130 articles between 2007-2015
252'000 articles between 2016-2024

- **False news * 8:**

3'010 articles between 2007-2015
25'400 articles between 2016-2024



LICONSERVATIVE.COM

Donald Trump Sent His Own Plane To Transport 200 Stranded Marines



PALMERREPORT.COM

Ahead Of His Possible Arrest, Jared Kushner Secretly Leaves The Country



MBCNEWS.COM

Trump gets endorsement of NYC police union, warns 'no one will be safe in Biden's America'



THEGUARDIAN.COM

Montana Republican refuses to quit over call for socialists to be 'jailed or shot'



An Ohio woman was charged by the Centerville Police Department with slowly eating her husband alive over a period of three years

A 62-year-old Centerville, Ohio woman has been arrested on charges of mutilation and assault for a brutal crime involving her 65-year-old husband.



Gray Wolves May Lose Endangered Status and Protections

Once again, federal wildlife officials say their numbers have rebounded. But conservationists may go back to court to fight the move.

A True partisan news



Abortion will soon become cost-free in Ireland

Until recently, abortion was illegal in Ireland. However, according to Health Minister Simon Harris, a new law is about to be submitted to the legislature in October proposing to make abortion cost-free...

B Fake partisan news



Republicans voted to allow people with pre-existing mental illness to buy firearms

Republican party Representatives voted to allow people with pre-existing mental illness to buy firearms, yet denied them health insurance to treat their pre-existing mental illness...



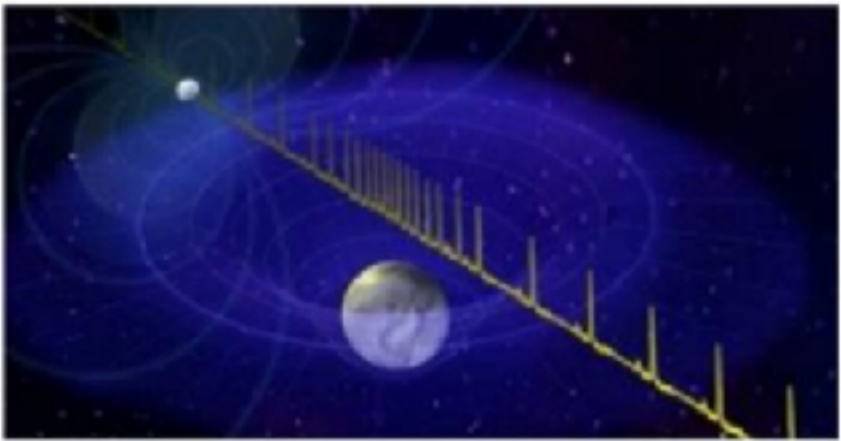
New evidence suggests a majority of abortion cases are on-demand and do not involve rape victims

One of the most common reasons given to justify abortion is that it may allow mothers to postpone childbearing to a more suitable time and provide already born children with more care and resources...



Chicago Shootings Prove That Gun Control Doesn't Reduce Crime

Chicago has the strongest gun laws in the U.S., and yet the total number of murders per inhabitant in Chicago is the highest in the country...



ABCNEWS.GO.COM
Scientists discover the 'most massive neutron star ever detected'

To the best of your knowledge, is the above headline accurate?

No

Yes



Devastating Flooding Threatens California Farmer's Pistachio Farm, Causing Massive Losses
Makram Hanna, a California businessman who invested his savings in a pistachio farm, faces a dire situation as his newly planted trees are submerged under 2 feet of water due to the resurgence of Tulare Lake.

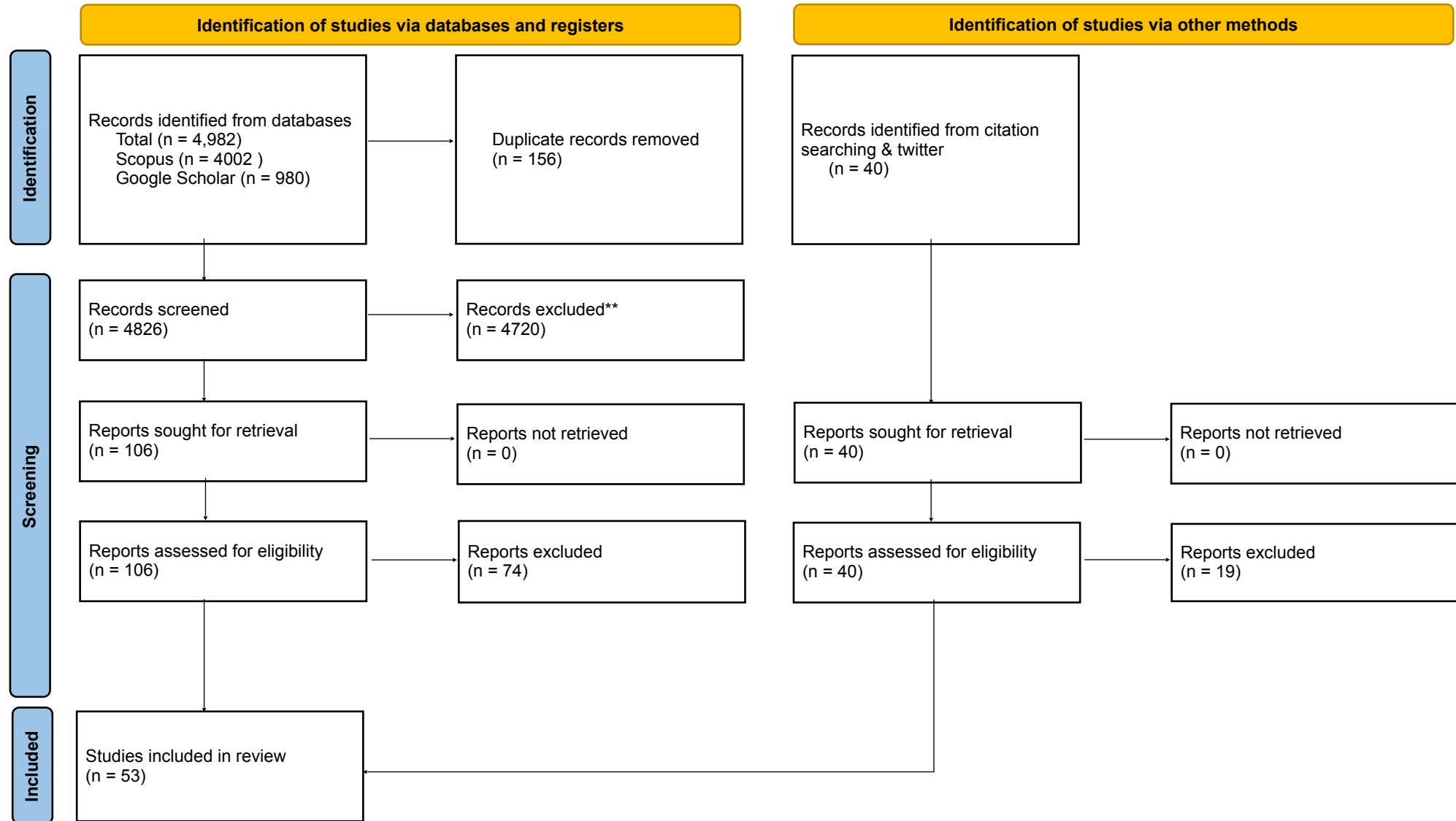
How accurate is the claim in the above headline?

- Certainly false
- Probably false
- Possibly false
- Possibly true
- Probably true
- Certainly true

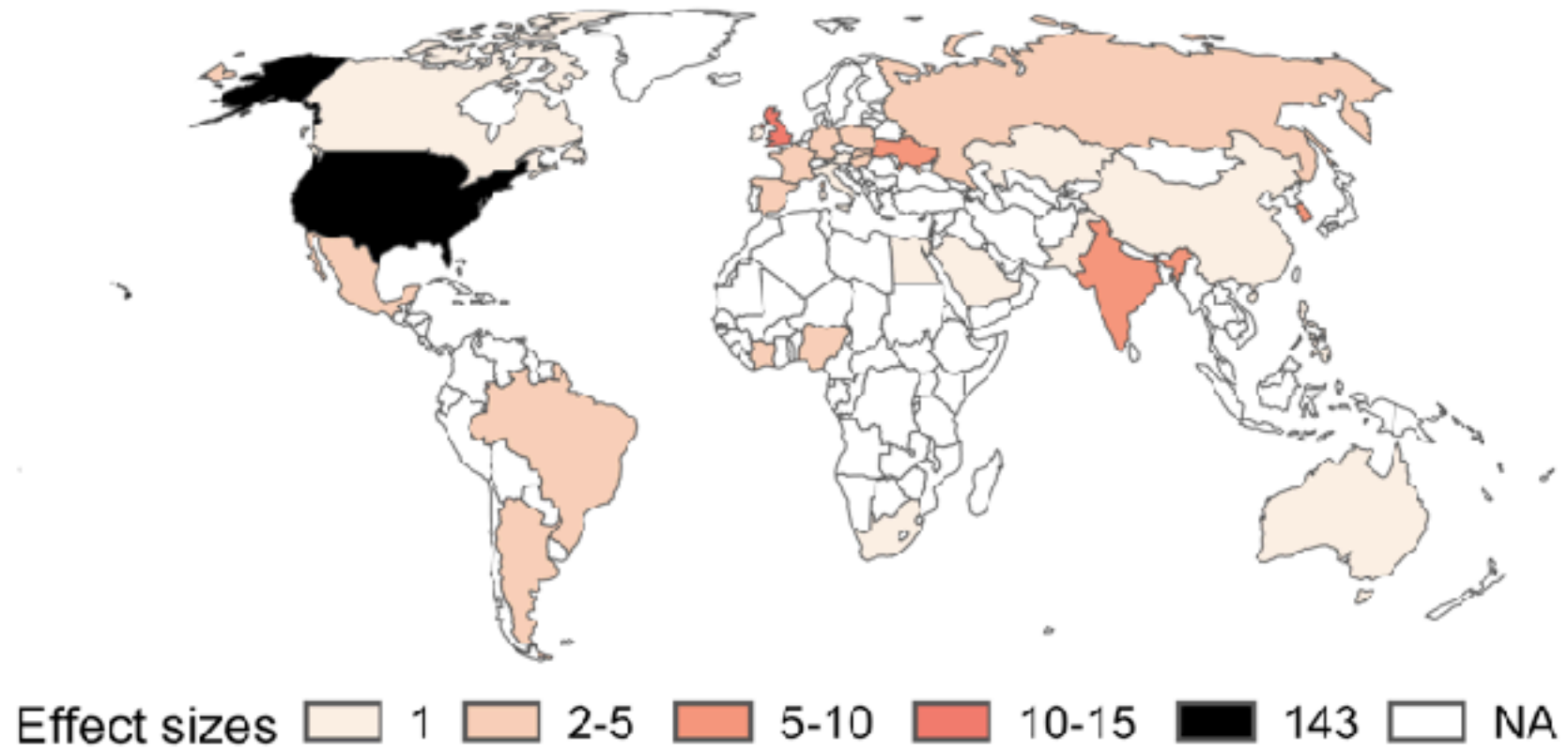


How good are people at judging
the veracity of true and false
news?

A systematic literature review using PRISMA

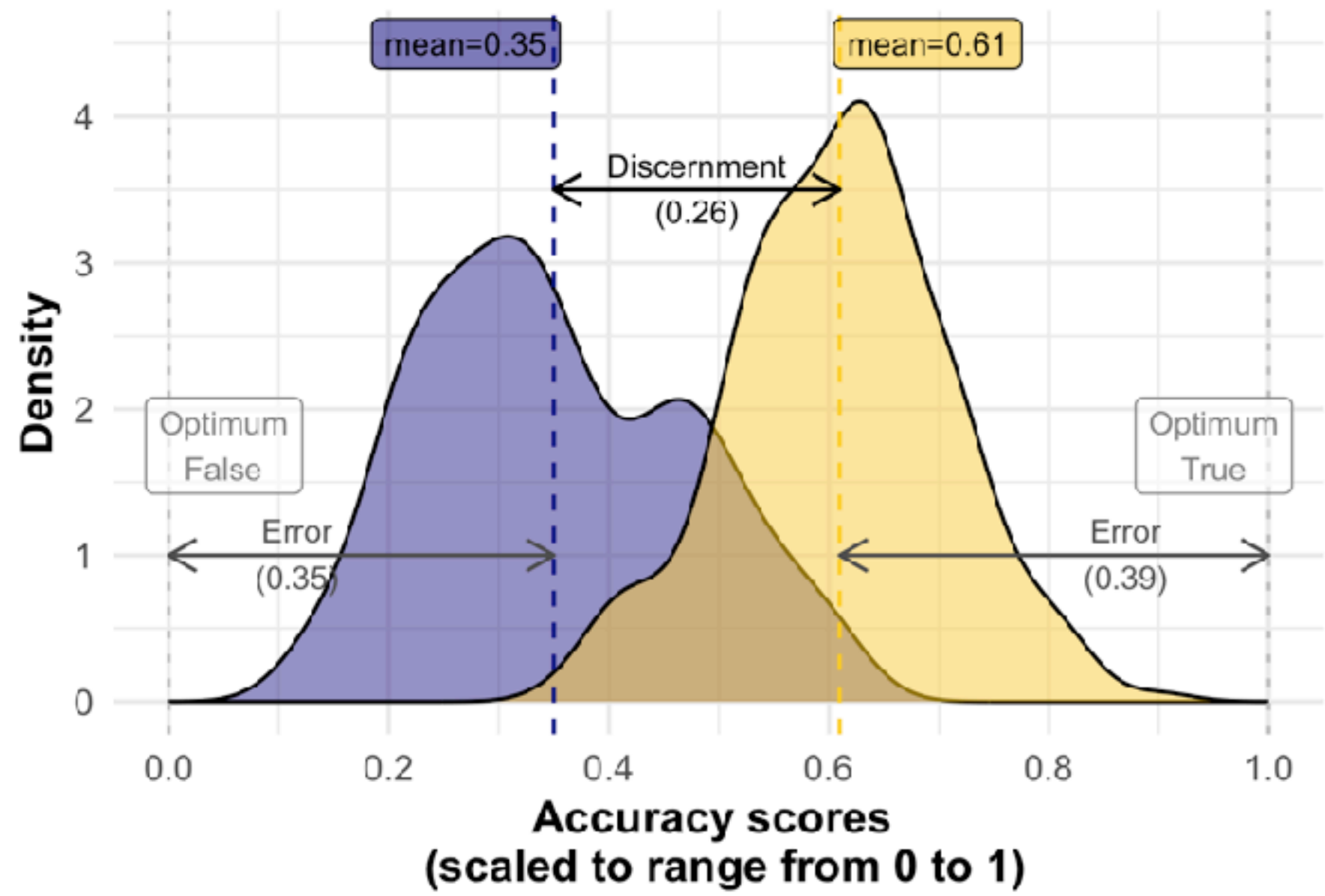


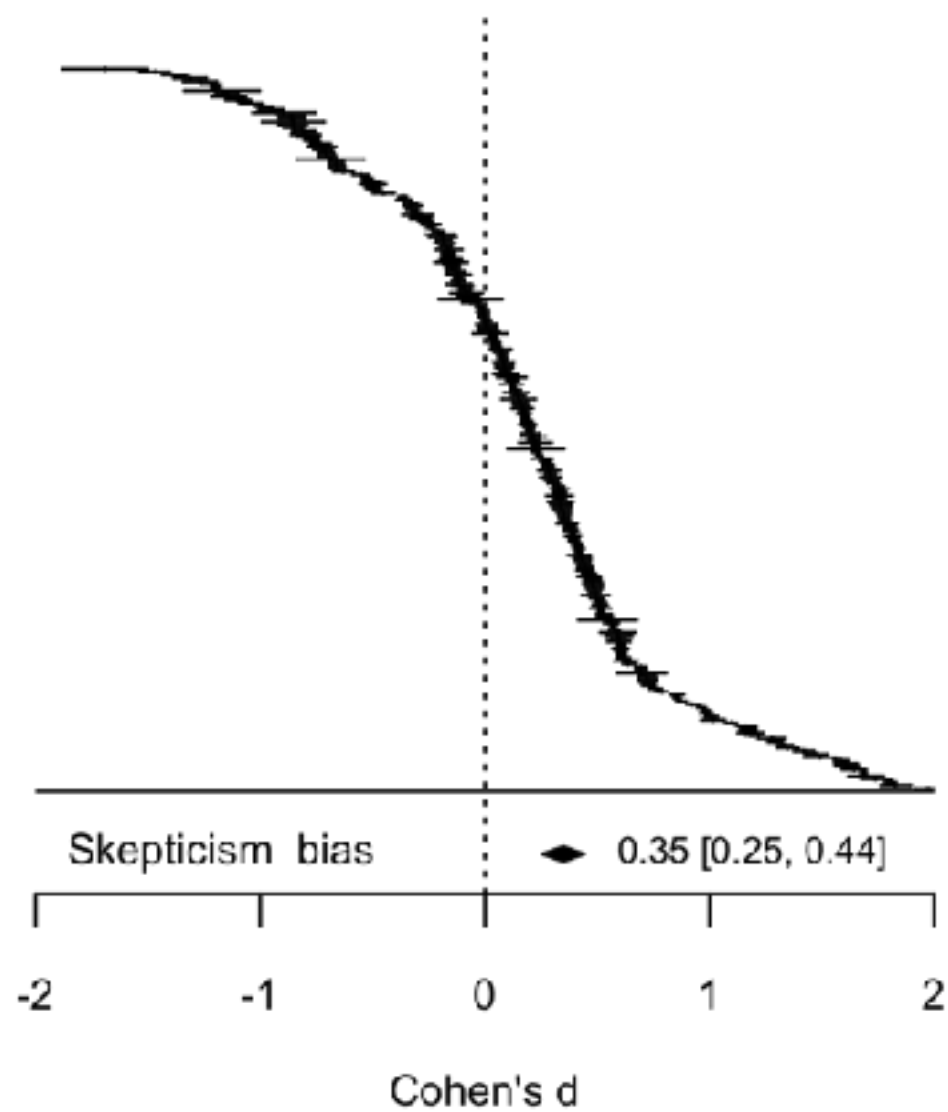
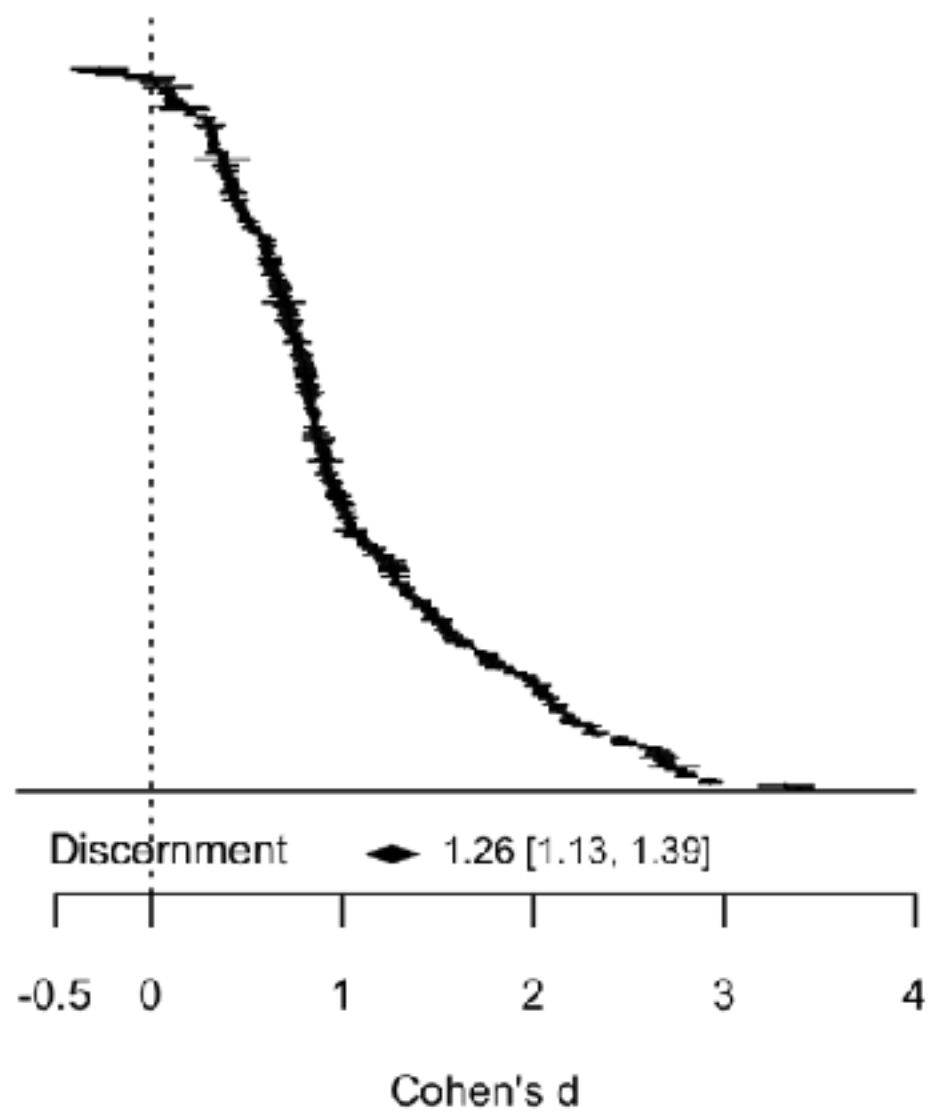
A total of 232 effect sizes



Two outcomes:
Discernment and Skepticism bias

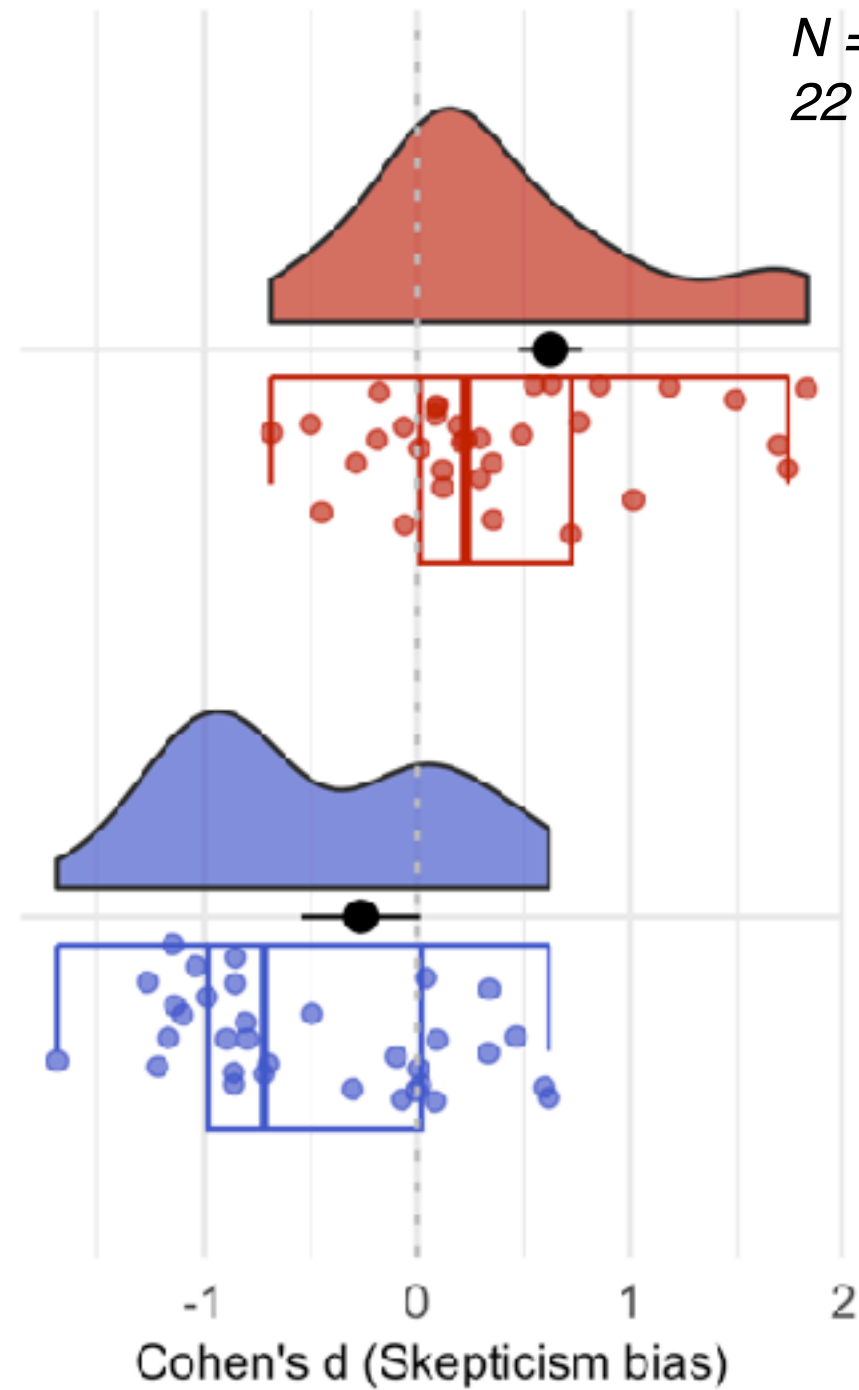
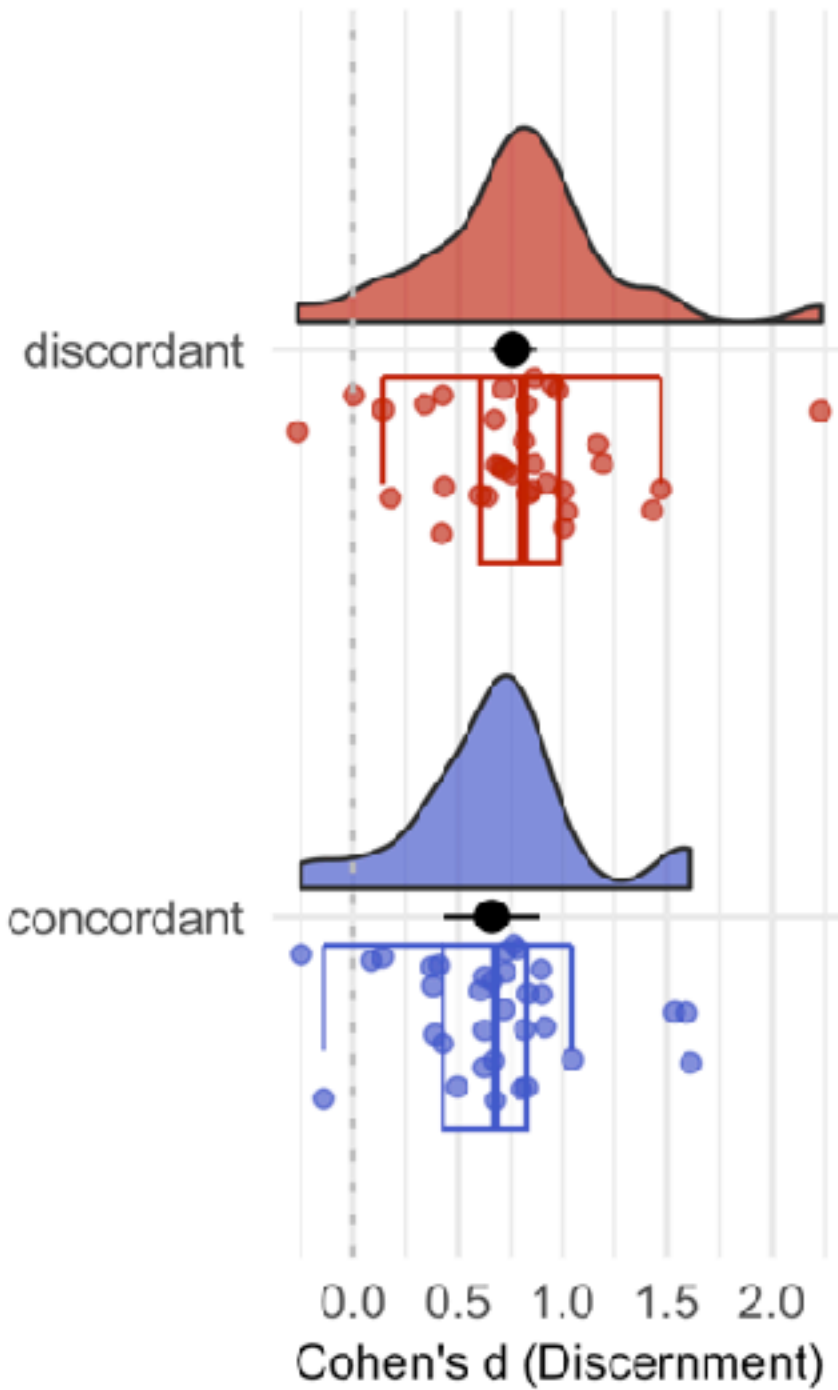
veracity | false | true





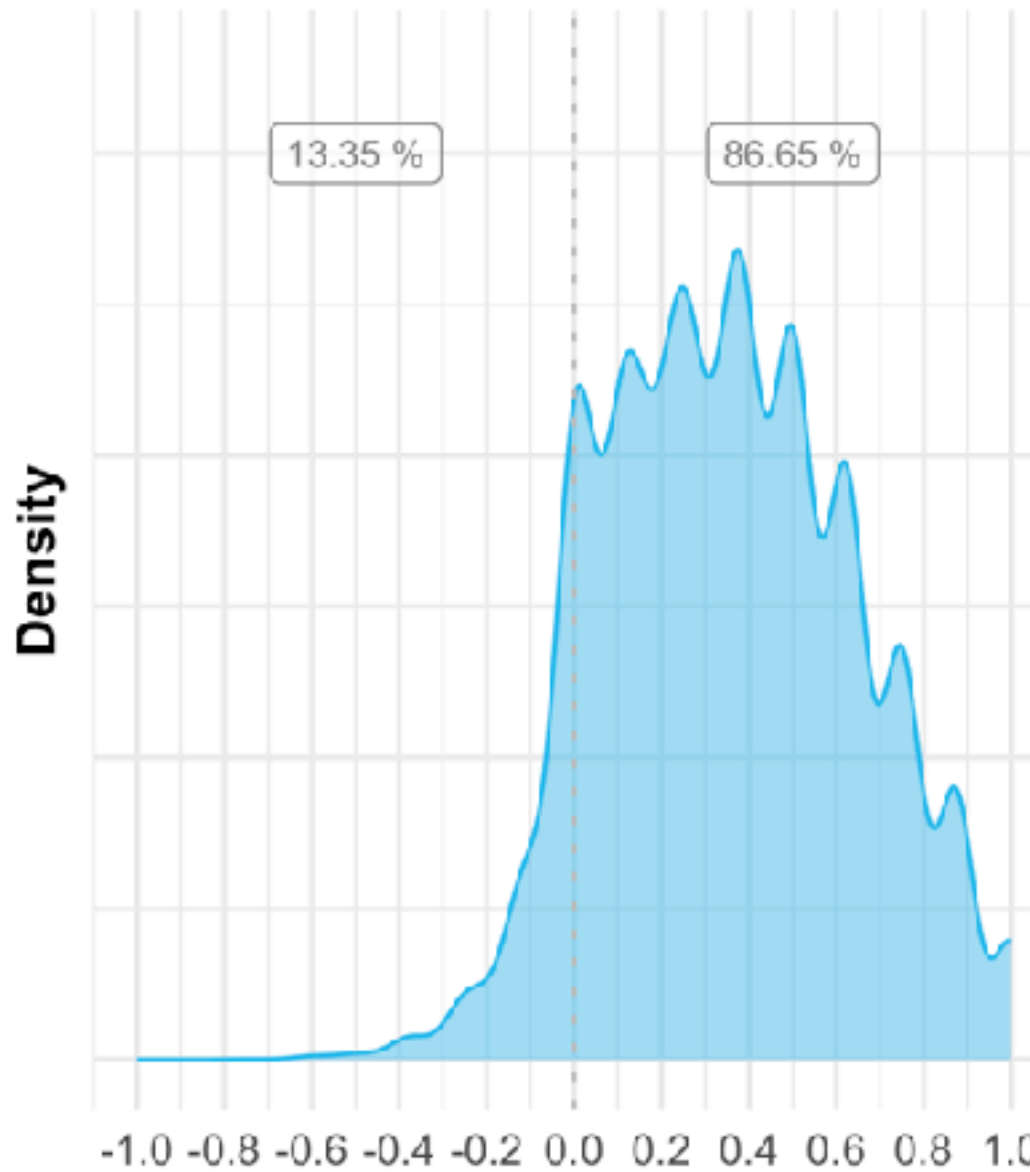
A moderator: Political Concordance

*N = 10 articles,
22 unique samples*

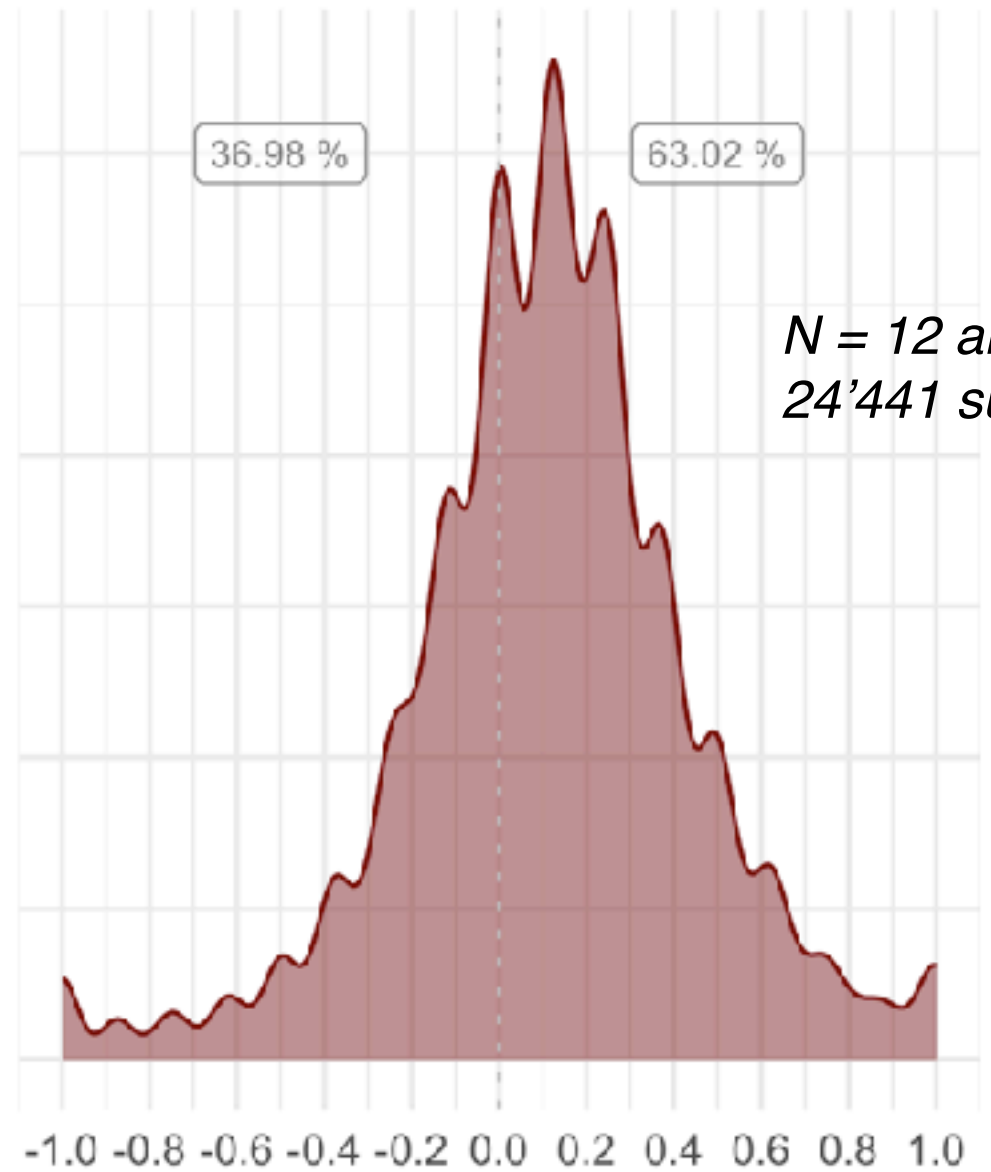


How about the individual level?

Discernment



Skepticism bias



*N = 12 articles,
24'441 subjects*

Robustness checks and limitations

- The results hold:
 - Across alternative effect size estimators
 - When collapsing Likert scales into binary
 - When relying on d' and c in Signal Detection Theory
- The results are likely limited to **fact-checked false news**, and may not generalize to misinformation more broadly.
- The results show that **people have the ability to identify false news when asked to do so**, but they may not always, or fully, use these abilities outside of experimental settings.

Conclusion

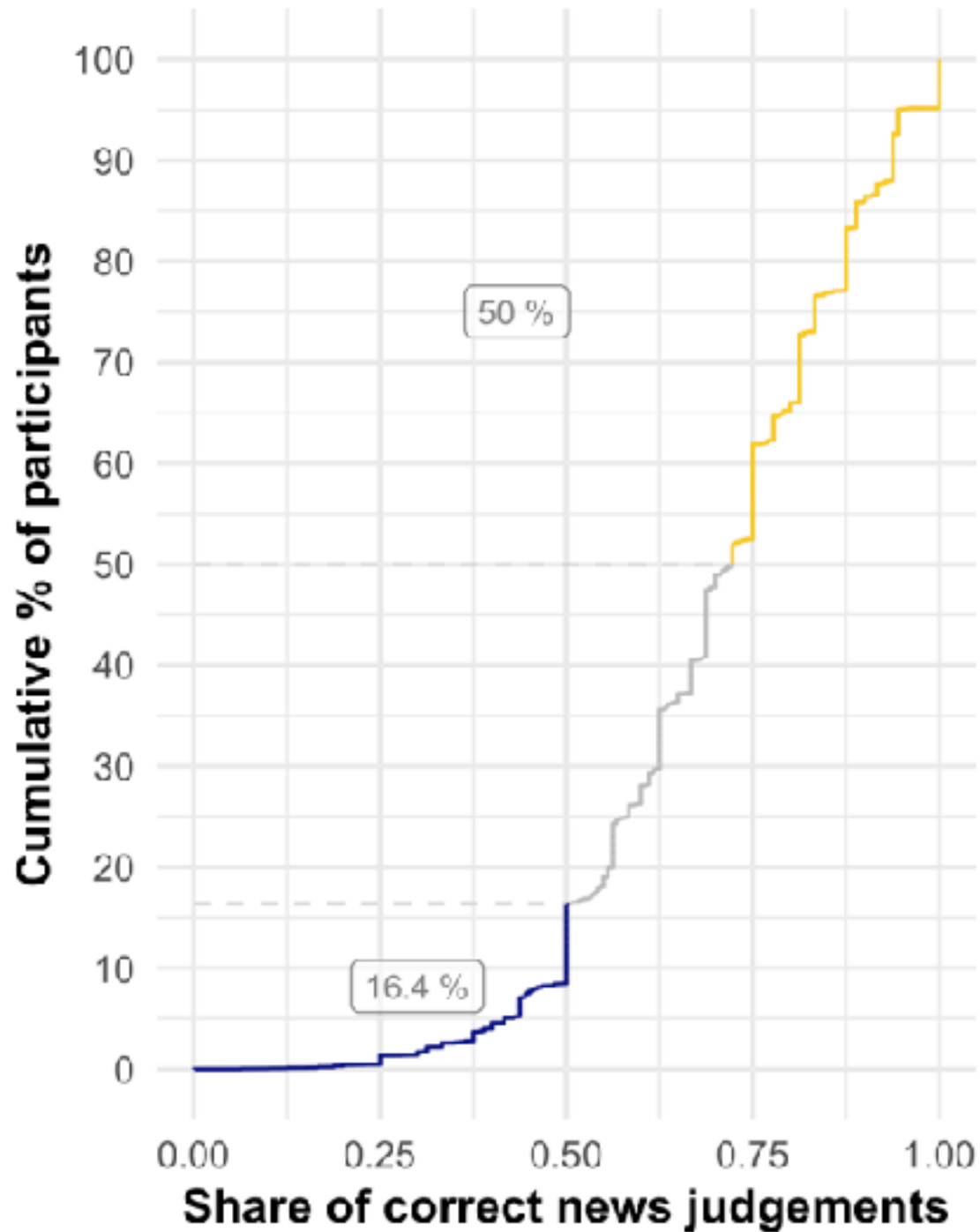
- People are able to discern true from false news, but err on the side of **skepticism** rather than credulity
- To improve discernment, there is more room to **increase the acceptance of true news** than to reduce the acceptance of false news.
- Crowdsourcing fact-checking on social media is promising.

Thank you!

- Pfänder, J., & Altay, S. (2023). Spotting False News and Doubting True News: A Meta-Analysis of News Judgements. osf.io/n9h4y



Backup slides



- At chance or worse
- Best 50% of participants
(correct at least 72.22 % of the time)

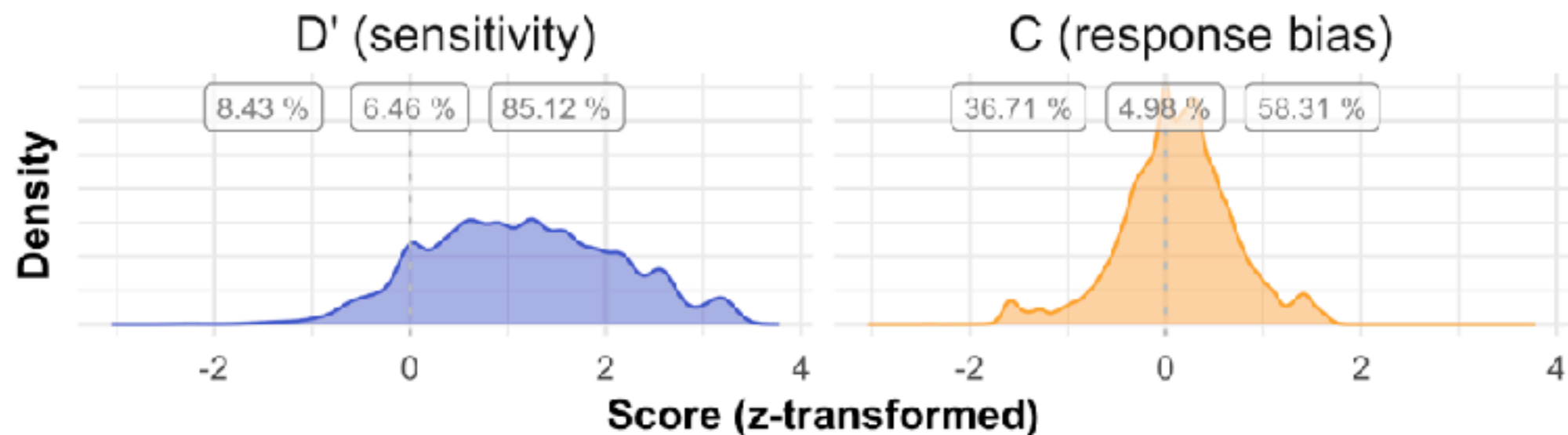
$$\text{Cohen's } d = \frac{\bar{x}_{\text{true}} - \bar{x}_{\text{false}}}{SD_{\text{pooled}}}$$

$$SD_{\text{pooled}} = \sqrt{\frac{SD_{\text{true}}^2 + SD_{\text{false}}^2}{2}}$$

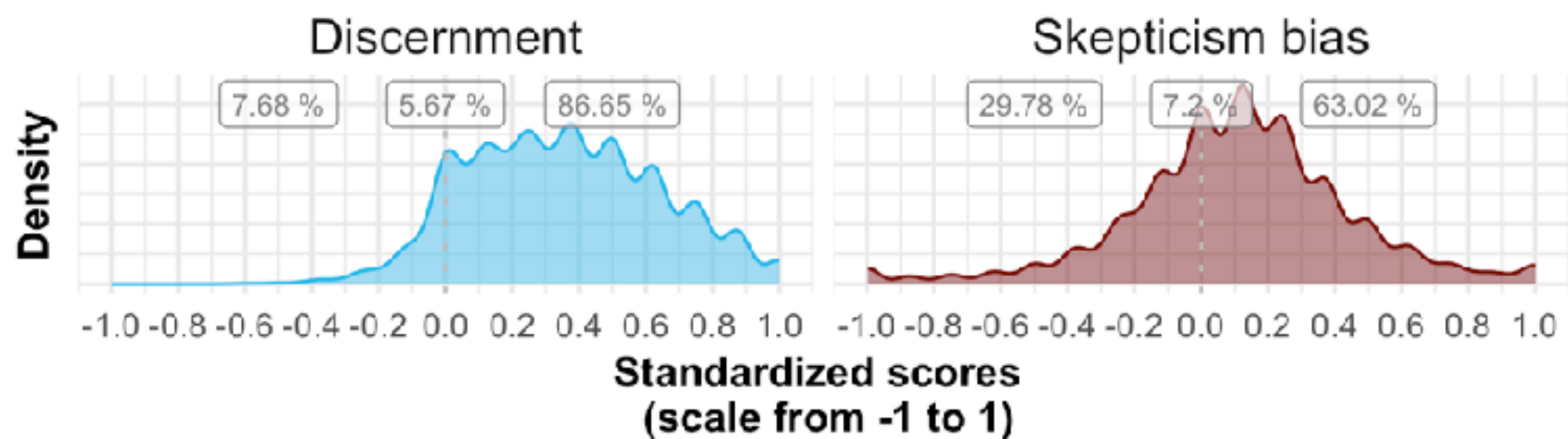
$$SE_{\text{Cohen's } d \text{ (within)}} = \sqrt{\frac{2(1 - r_{\text{true,false}})}{n} + \frac{\text{Cohen's } d^2}{2n}}$$

$$SE_{\text{Cohen's } d \text{ (between)}} = \sqrt{\frac{n_{\text{true}} + n_{\text{false}}}{n_{\text{true}}n_{\text{false}}} + \frac{\text{Cohen's } d^2}{2(n_{\text{true}} + n_{\text{false}})}}$$

(SDT Framework)



(Our measures)



Model results

	<i>Main estimator</i>		<i>Preregistered estimator</i>		<i>Alternative estimators</i>			
	Cohen's d		SMCC		SMCR		SMD	
	Discernment	Skepticism bias	Discernment	Skepticism bias	Discernment	Skepticism bias	Discernment	Skepticism bias
Estimate	1.262*** (0.067)	0.350*** (0.048)	0.992*** (0.053)	0.270*** (0.039)	1.288*** (0.072)	0.342*** (0.048)	1.262*** (0.067)	0.350*** (0.048)
Num.Obs.	231	231	231	231	231	231	231	231
AIC	365.1	408.0	251.3	301.6	391.9	404.8	365.1	407.9
BIC	375.5	418.3	261.7	312.0	402.2	415.1	375.4	418.2

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note: Comparison of different effect sizes. Cohen's d is the estimator we report in the main analysis. SMCC (Standardized mean change using change score standardization) is the estimator we pre-registered. For reference, we provide the results we obtain when using a standardized mean difference assuming independence for all effect sizes (SMD), precisely Hedge's g, and a standardized change score using raw (instead of change) standardization (SMCR). For effects from studies that used a between participant design, we calculated Hedge's g in the results listed under "SMCC" and "SMCR".

(Raw) Mean Differences between true and false news

	4-point	10-point	binary	7-point	6-point	1-point	21-point
<i>Discernment</i>							
Estimate	0.862*** (0.058)	2.440*** (0.171)	0.382*** (0.030)	1.600*** (0.201)	1.140*** (0.072)	0.290*** (0.023)	3.249*** (0.414)
Num.Obs.	91	2	34	42	30	24	1
AIC	24.1	6.2	-52.8	112.1	26.7	-32.8	6.5
BIC	31.6	2.3	-48.2	117.3	30.9	-29.3	2.5
<i>Skepticism bias</i>							
Estimate	0.337*** (0.067)	-1.807+ (1.078)	0.044 (0.032)	0.131 (0.095)	0.784*** (0.160)	0.092*** (0.017)	4.361*** (0.858)
Num.Obs.	91	2	34	42	30	24	1
AIC	86.6	17.3	-12.5	76.7	85.7	-47.2	9.4
BIC	94.2	13.3	-8.0	81.9	89.9	-43.7	5.4

Note:

One scale, a 100-point scale, does not appear since there was only one effect size on that scale
+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Individual-level studies with likert scale ratings collapsed to binary outcome

	<i>(based on individual data)</i>		<i>(based on meta data)</i>			
	Log OR		Cohen's d		Mean change	
	Accuracy	Error	Accuracy	Error	Accuracy	Error
Estimate	1.864*** (0.127)	0.422*** (0.112)	0.932*** (0.078)	0.312*** (0.084)	0.853*** (0.092)	0.379*** (0.101)
Num.Obs.	25	25	58	58	58	58
AIC	56.1	49.6	22.9	95.5	42.5	110.9
BIC	59.8	53.3	29.1	101.7	48.7	117.1

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note: Note that the number of observations differ, because some samples provide several effect sizes in the meta-data. For the odds ratios based on the individual data, however, we calculated only one average effect size per sample. The sample consists of all studies we had individual-level data on. For individual-level studies with continuous response scales, we computed the odds ratio after collapsing responses to a binary outcome.