# Do search engines amplify or suppress LGBTQ+ polarization?

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European MEDIA AND INFORMATION Fund

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# Tilburg Algorithm Observatory (TAO)

Part of Academic Collaborative Center for a Resilient Democratic Society (REDES)



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# Democracy and online platforms

- Polarization can decrease trust in insitutions, distrupt democratic functioning, and result in real-world harm.
- European Institutions concerned about the increase of polarization through online platforms (Fletcher & Jenkins, 2019).

# Democracy and search engines

- Search engines are the modern gatekeepers to online information.
- Widely used and **highly trusted** (Edelman, 2025; Aslett et al., 2023).
- However, there are known cases of bias in search engines.
  - Political bias: Robertson et al., (2018); Hu et al., (2018).
  - Election influence: Epstein & Robertson, (2015).
  - Information warfare: Williams & Carley, (2023).

# Tools and targets of influence

**Problem**: We know little about how they handle a societally contentious topic likely to fuel polarization:

- Monitoring SE's difficult.
- Small-scale.
- Studies often US-focused

# Our aims

- Multi-lingual context,
- Large-scale monitoring study,
- Focus on a currently polarized topic: **LGBTQ+ issues.**

Why LGBTQ+?

- Disinformation campaigns (Strand & Svensson, 2022).
- Democratic backsliding (Flores, Carreno & Shaw, 2023).

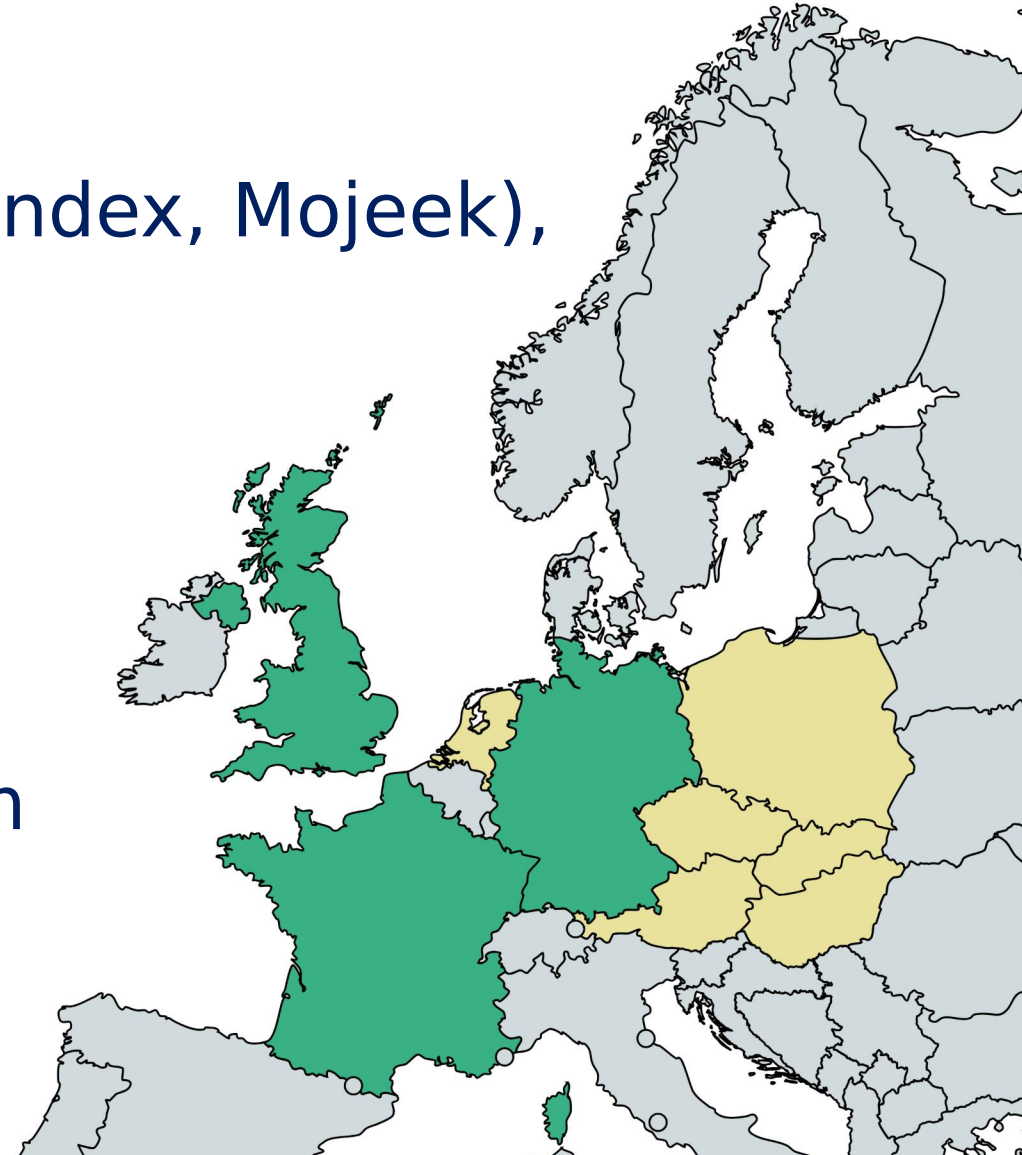
# Methods

We monitored:

- 4 search engines (Google, Bing, Yandex, Mojeek),
- 3 countries (FR, DE, UK),
- for 3 months in 2024,
- with ~1300 multi-lingual queries.

Dataset size:

- 560 thousand search results from automated queries



# Methods - Queries

Queries were either **neutral ...**

trans therapy

**Search results**

Generic News
https://genericnews.com/today/what_are_people_saying_about_LGBT...
Today's News of LGBTIQ
People say many things about the LGBTIQ+ community. But what are they saying today? Read Generic News for your most up to date generic news, today...

LGBTIQ Information
https://find_lgbt_info.com/definitions/lgbtiq...
LGBTIQ+: What does it stand for?
What does each letter in LGBTIQ+ mean? Read on to find out the history of gay labels and how the acronym was created.

LGBTIQ Information
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LGBTIQ+: What does it stand for?
What does each letter in LGBTIQ+ mean? Read on to find out the history of gay labels and how the acronym was created.

or **negative ...**

transing away the gay

Polarising Opinions
https://polarising_the_world.com/LGBT_is_very_bad...
Don't believe what the crazy gay lobby says...
I have nothing nice to say on this topic, and am very angry about it. Do not believe what the deep state tells you, sheeple, because the lobbyists are coming for your children...

Polarising Opinions
https://polarising_the_world.com/LGBT_is_very_bad...
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Don't believe what the crazy gay lobby says...
I have nothing nice to say on this topic, and am very angry about it. Do not believe what the deep state tells you, sheeple, because the lobbyists are coming for your children...

# Example - “trans therapy”




Home › What's worrying you? › Gender dysphoria

WHAT'S WORRYING YOU?

## Gender dysphoria

**Written by Ellen Lees**

Last updated 7th August 2026 | Next update due August 2029

Gender dysphoria describes the distress or discomfort some people experience when their gender identity differs from the sex registered at birth. Everyone's experience is different, and understanding or exploring your feelings can take time.

Gender dysphoria can affect a person's mental health and wellbeing. Feelings of distress may be made more difficult by a lack of support, fear of judgement or discrimination, or not feeling able to express your identity openly.

Here, we explain what gender dysphoria is, the support available, and how counselling can provide a safe, non-judgmental space to explore your thoughts and feelings.

# Example - “transing away the gay”



spiked

## Kemi is right: trans ideology is a threat to gay kids

So called gender-affirming care is merely a new form of gay conversion therapy.

DENNIS KAVANAGH

7th December 2023



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# Methods - reference data

NewsGuard

- Journalists/editors evaluate **12 thousand** web-domains
- Political leaning [Left, No bias, Right]
- Credibility score [0-100]
  - A score under 60 is considered “untrustworthy”

- We combine political leaning and credibility score to examine polarization.

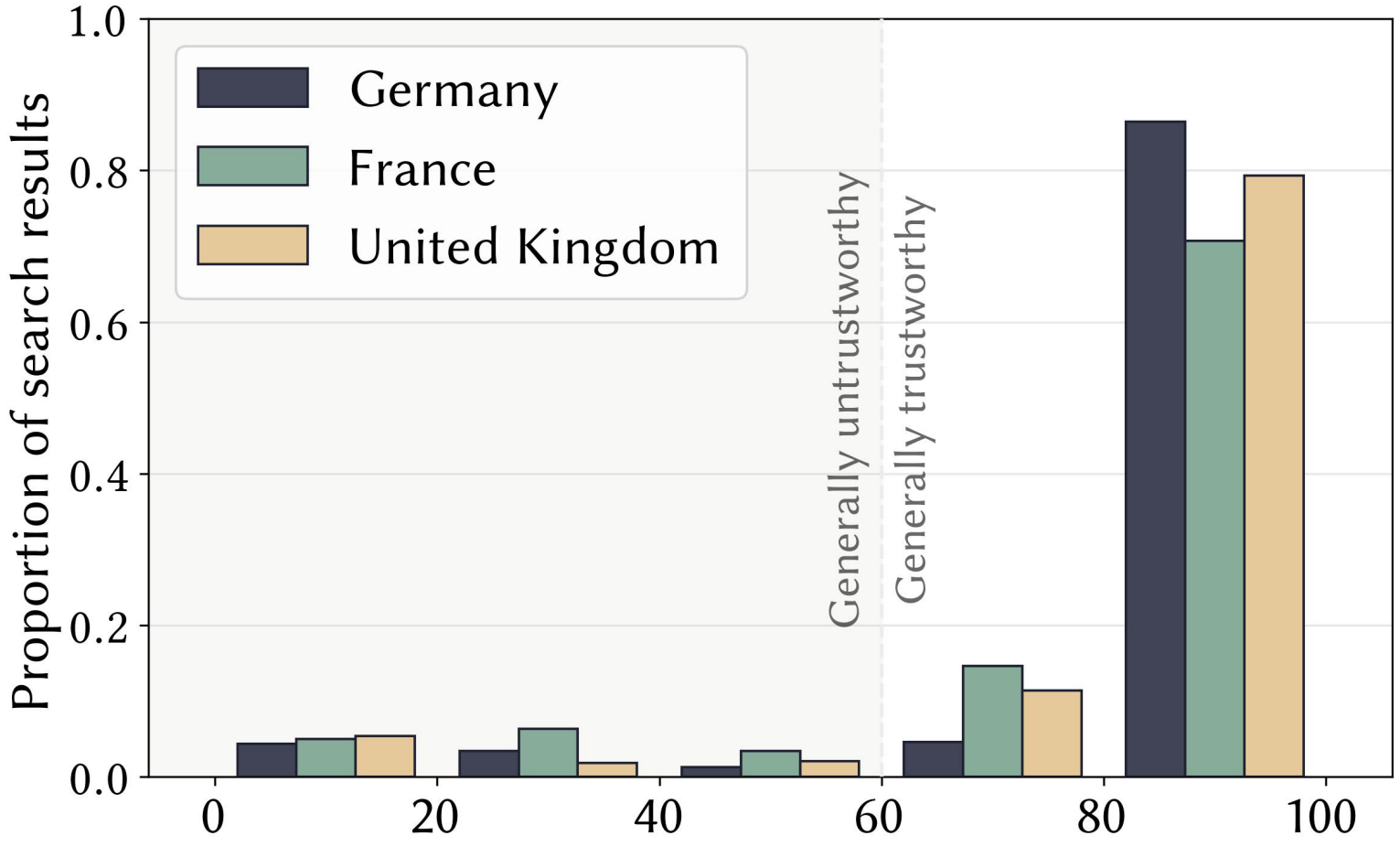
# Quick reminder

We can examine what likely exposes users to polarizing content on search engines:

- user's location
- user's choice of search engine
- user's input query (neutral vs negative)

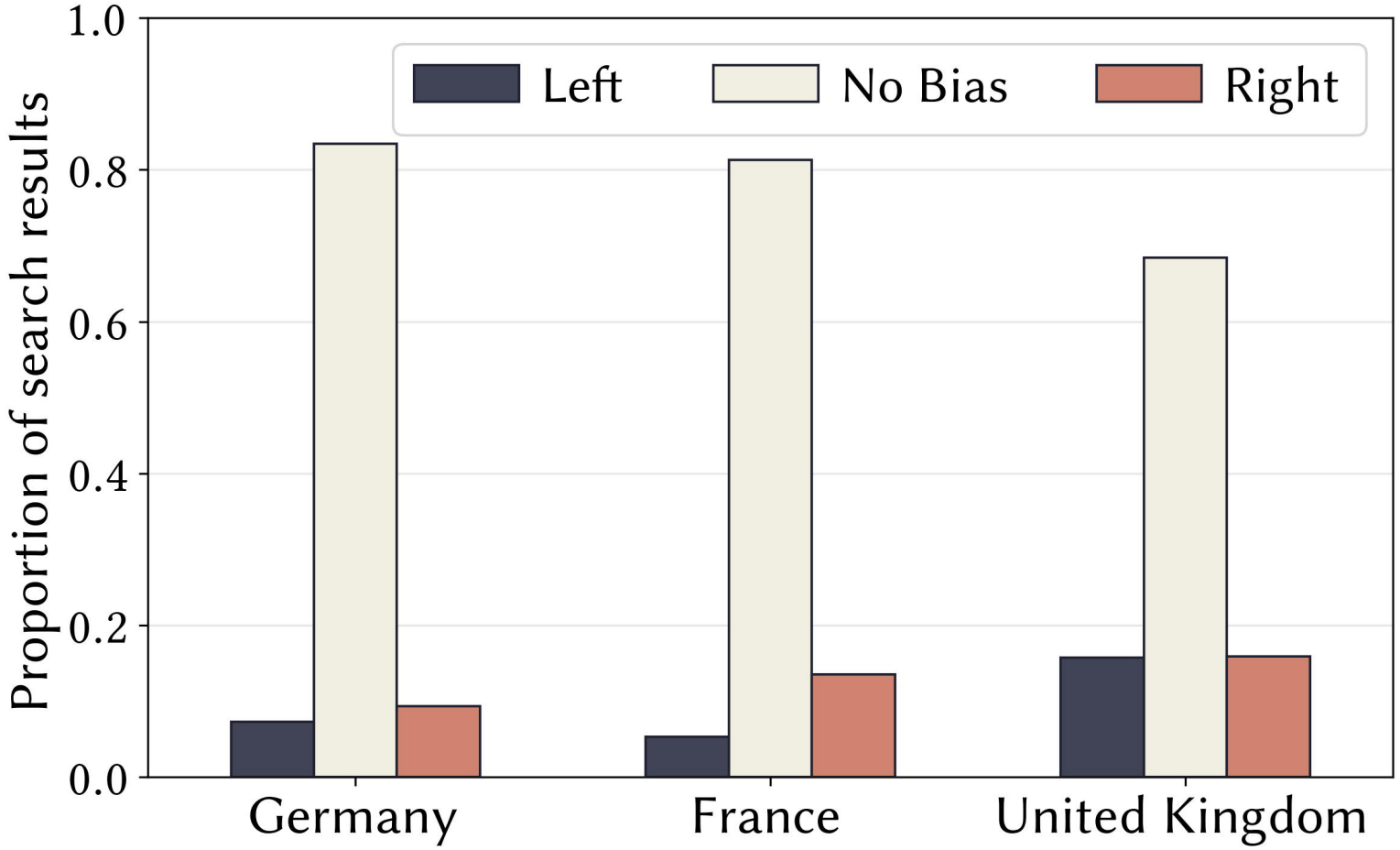
# Results - Location and Language

- Credibility per country, across all search engines



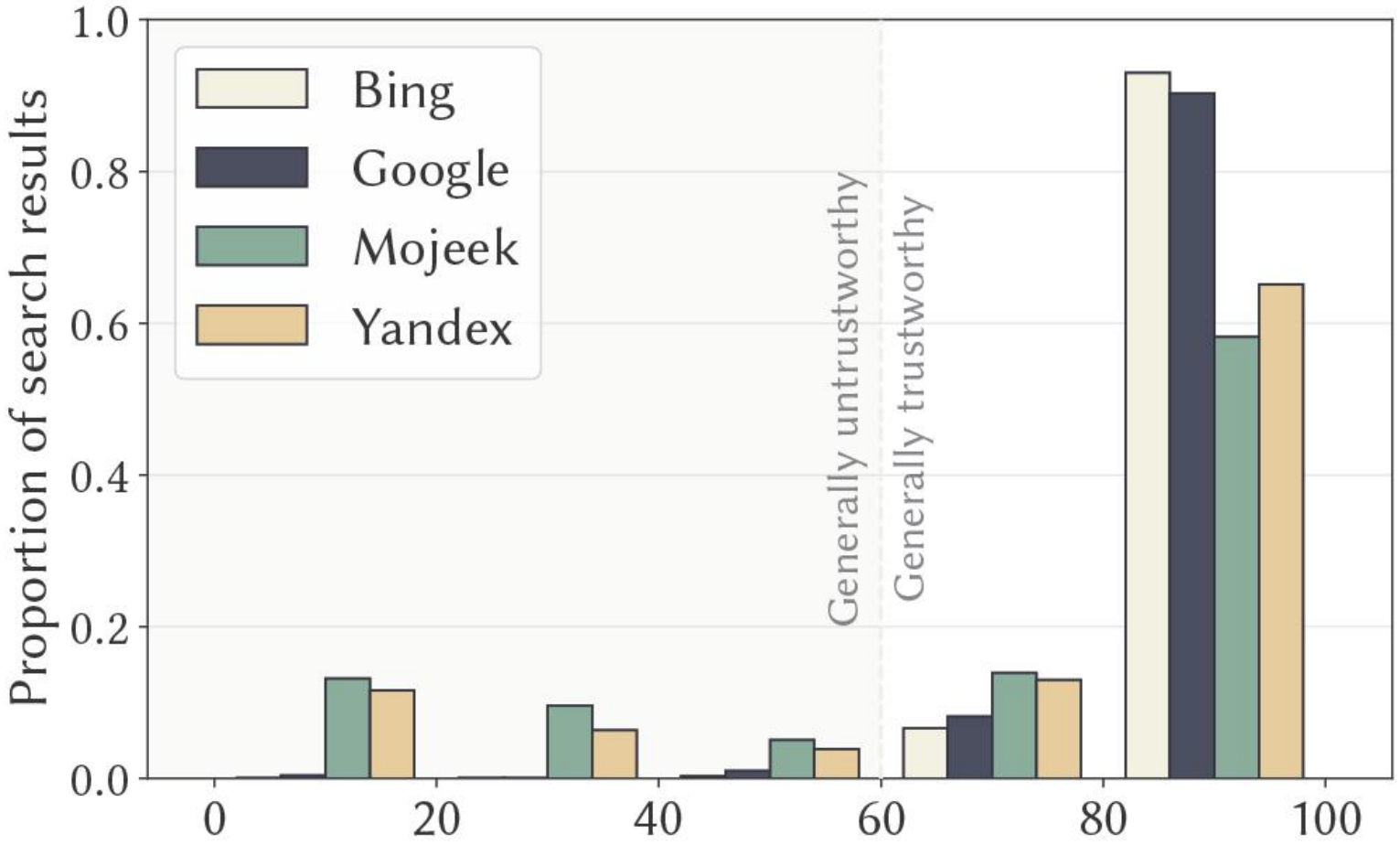
# Results - Location and Language

- Political leaning per country, across all search engines



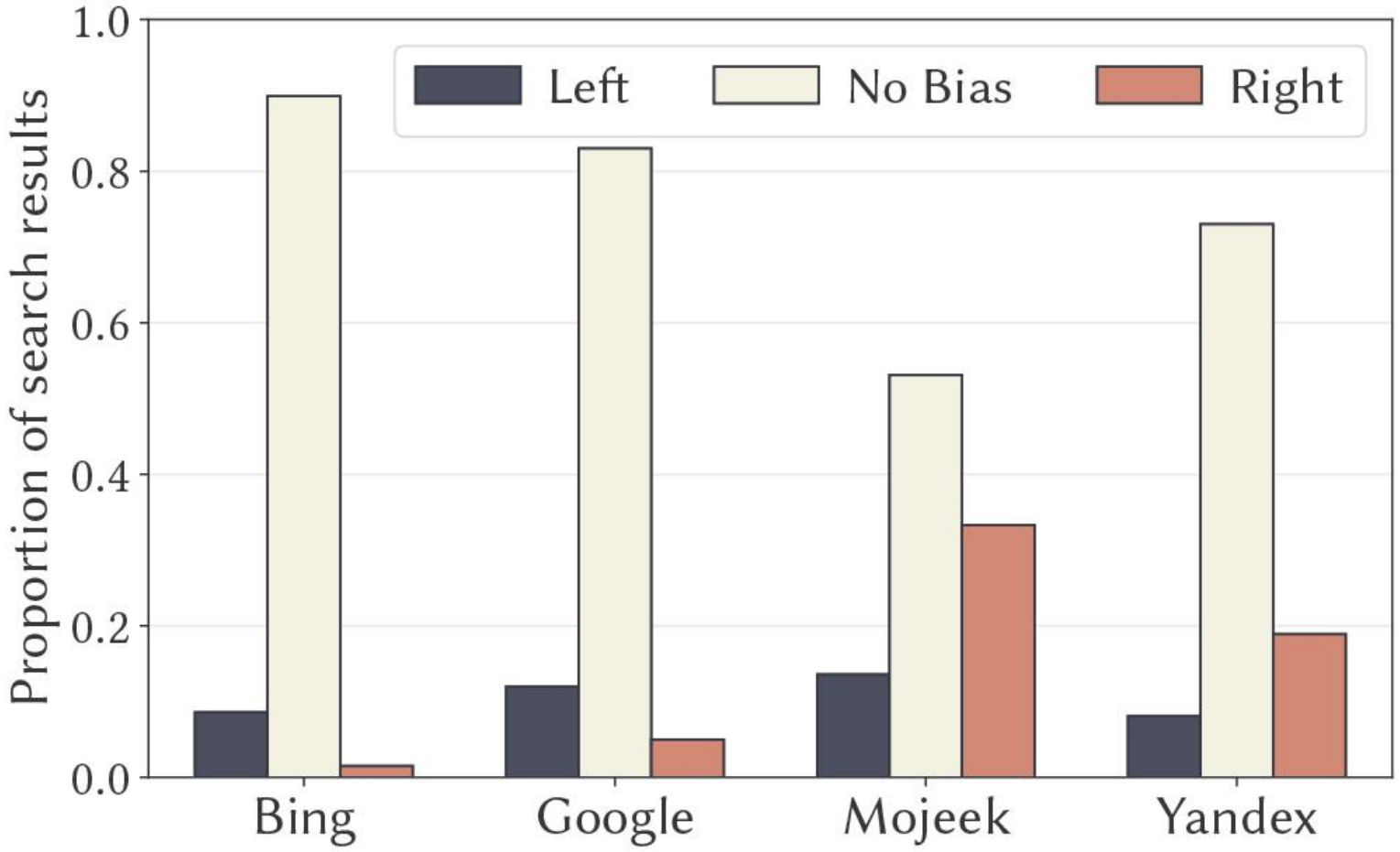
# Results - Search engine

- Credibility scores per search engine, across all countries

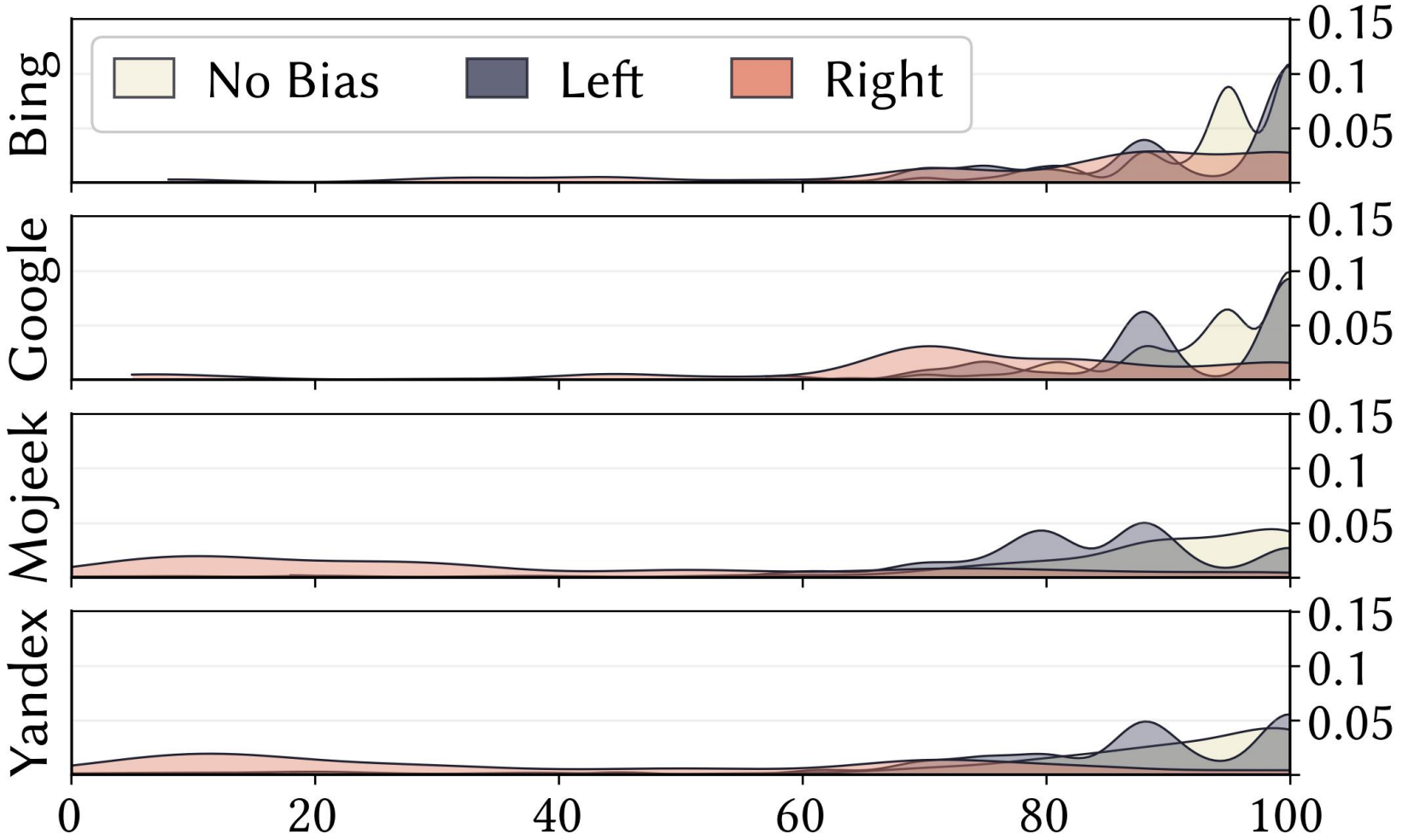


# Results - Search engine

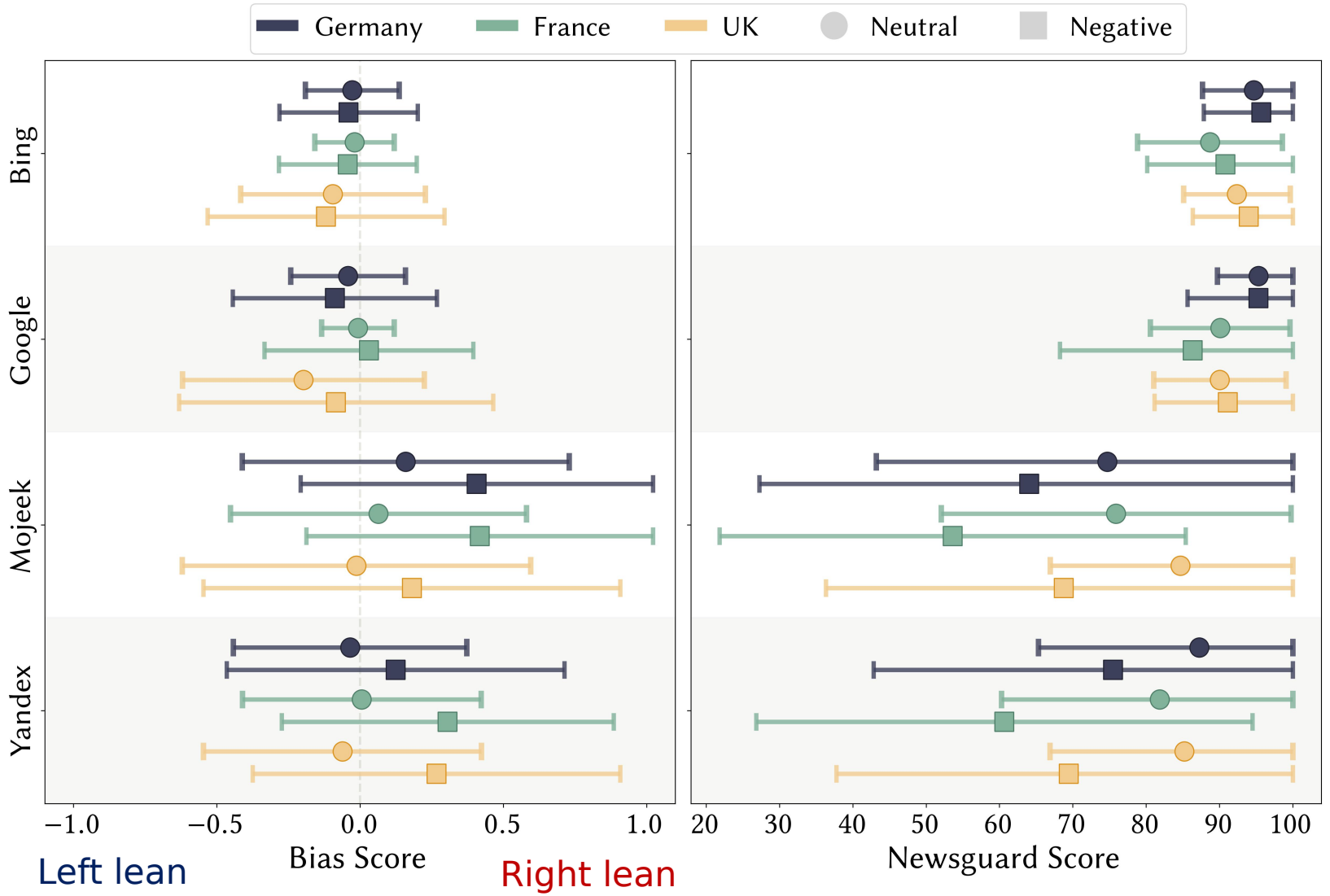
- Political leaning per search engine, across all countries



# Results - Political lean and credibility



# Results - Query polarity



# Discussion

- Location and language matter relatively little,
- Choice of search engine biggest determinant,
  - Bing and Google re-direct users to more moderate content,
  - Mojeek and Yandex show more polarizing content even to neutral users, and mirror negative user input

# Concluding take-aways

- Location matters comparatively little
- Choice of **search engine** biggest determinant
  - Bing & Google: → 0.2 results on the first page unreliable
    → redirect users to moderate content
  - Mojeek & Yandex: → 2-3 results on the first page unreliable
    → more polarizing content to neutral users, and negative queries amplifed
- Do differences reflect accidental downstream effects, or editorial choices?

# References


**Edelman Trust Institute**. 2024b. “2025 Edelman trust barometer.” *Edelman*, 50.

Emil **Edenborg**. Jan. 1, 2023. “‘Traditional values’ and the narrative of gay rights as modernity: Sexual politics beyond polarization.” *Sexualities*, 26, 1, (Jan. 1, 2023), 37–53. Publisher: SAGE Publications Ltd. doi: 10.1177/13634607211008067.

Robert **Epstein** and Ronald **Robertson**. 2015. “The search engine manipulation effect (SEME) and its possible impact on the outcomes of elections.” Proceedings of the National Academy of Sciences, 112, 33, E4512–E4521. eprint: https://www.pnas.org/doi/pdf/10.1073/pnas.1419828112. doi: 10.1073/pnas.1419828112.

R **Fletcher** and J **Jenkins**. 2019. “Polarisation and the news media in Europe.” *Publications Office of the EU*, 1–49. Retrieved Feb. 27, 2025 from https://data.europa.eu/doi/10.2861/059702.

Andrew R **Flores**, Miguel Fuentes, and Ari Shaw. 2023. Democratic backsliding and LGBTI acceptance. (2023).

Kiran **Garimella**, Tim Smith, Rebecca Weiss, and Robert West. May 22, 2021. “Political Polarization in Online News Consumption.” *Proceedings of the International AAAI Conference on Web and Social Media*, 15, (May 22, 2021), 152–162. doi: 10.1609/icwsm.v15i1.18049.

George **Geguchadze** and Maia **Urushadze**. 2021. “The LGBTQ issue as a supplementary tool for polarization in post-Soviet countries–the case of Georgia.” *STRATEGIES XXI: The Complex and Dynamic Nature of the Security Environment,* 84–93.

Mykola **Makhortykh**, Tobias Rorhbach, Maryna Sydorova, and Elizaveta Kuznetsova. Jan. 8, 2025. Search engines in polarized media environment: Auditing political information curation on Google and Bing prior to 2024 US elections. (Jan. 8, 2025). *arXiv*: 2501.04763[cs]. doi: 10.48550/arXiv.2501.04763.

Mykola **Makhortykh**, Aleksandra **Urman**, and Mariëlle **Wijermars**. Mar. 7, 2022. “A story of (non)compliance, bias, and conspiracies: How Google and Yandex represented Smart Voting during the 2021 parliamentary elections in Russia.” *Harvard Kennedy School Misinformation Review*, (Mar. 7, 2022). doi: 10.37016/mr-2020-94.

Elizaveta **Kuznetsova**, Mykola Makhortykh, Maryna Sydorova, Aleksandra Urman, Ilaria Vitulano, and Martha Stolze. Jan. 24, 2024. Algorithmically Curated Lies: How Search Engines Handle Misinformation about US Biolabs in Ukraine. (Jan. 24, 2024). *arXiv*: 2401.13832[cs]. doi: 10.48550/arXiv.2401.13832.

Ernesto de **León**, Mykola Makhortykh, Aleksandra Urman, and Roberto Ulloa. Aug. 30, 2024. Googling the Big Lie: Search Engines, News Media, and the US 2020 Election Conspiracy. (Aug. 30, 2024). *arXiv*: 2409.10531[cs]. doi: 10.48550/arXiv.2409.10531.

Barbara **Grabowska-Moroz** and Anna **Wójcik**. 2021. “Reframing LGBT rights advocacy in the context of the rule of law backsliding: The case of Poland.” *Intersections. East European Journal of Society and Politics,* 7, 4, 85–103. Number: 4. doi:10.17356/ieejsp.v7i4.852.

Mario **Haim**. May 18, 2020. “Agent-based Testing: An Automated Approach toward Artificial Reactions to Human Behavior.” *Journalism Studies*, 21, 7, (May 18, 2020), 895–911. doi: 10.1080/1461670X.2019.1702892.

Emily **Kubin** and Christian von **Sikorski**. Sept. 1, 2021. “The Role of (Social) Media in Political Polarization: A Systematic Review.” *Annals of the International Communication Association*, 45, 3, (Sept. 1, 2021), 188–206. doi: 10.1080/23808985.2021.1976070.

Cecilia **Strand**, Jakob Svensson, Roland Blomeyer, and Margarita Sanz. 2021. Disinformation campaigns about LGBTI+ people in the EU and foreign influence. *European Parliament, Policy Department for External Relations*.

Ov Cristian **Norocel** and David **Paternotte**. Mar. 4, 2023. “The Dis/Articulation of Anti-Gender Politics in Eastern Europe: Introduction.” *Problems of Post-Communism,* 70, 2, (Mar. 4, 2023), 123–129. doi: 10.1080/10758216.2023.2176075

Sebastian **Schultheiß** and Dirk **Lewandowski**. June 1, 2023. “Misplaced trust? The relationship between trust, ability to identify commercially influenced results and search engine preference.” *Journal of Information Science*, 49, 3, (June 1, 2023), 609–623. Publisher: SAGE Publications Ltd. doi: 10.1177/01655515211014157.

Kevin **Aslett**, Zeve Sanderson, William Godel, Nathaniel Persily, Jonathan Nagler, and Joshua A. Tucker. Jan. 2024. “Online searches to evaluate misinformation can increase its perceived veracity.” *Nature*, 625, 7995, (Jan. 2024), 548–556. Publisher: Nature Publishing Group. doi: 10.1038/s41586-023-06883-y.

Levi **Boxell**, Matthew Gentzkow, and Jesse M. Shapiro. Mar. 19, 2024. “Cross-Country Trends in Affective Polarization.” *The Review of Economics and Statistics*, 106, 2, (Mar. 19, 2024), 557–565. doi: 10.1162/rest_a_01160.

# References


Sedona **Chinn**, P. Sol Hart, and Stuart Soroka. Feb. 1, 2020. “Politicization and Polarization in Climate Change News Content, 1985-2017.” *Science Communication,* 42, 1, (Feb. 1, 2020), 112–129. Publisher: SAGE Publications Inc. doi:10.1177/1075547019900290.

Javier **Corrales** and Jacob **Kiryk**. Aug. 2022. Homophobic Populism. (Aug. 2022). doi: 10.1093/acrefore/9780190228637.013.2080.

Axel **Westerwick**. Jan. 2013. “Effects of Sponsorship, Web Site Design, and Google Ranking on the Credibility of Online Information.” *Journal of Computer-Mediated Communication*, 18, 2, (Jan. 2013), 194–211

Jason **Weismueller**, Richard L. Gruner, Paul Harrigan, Kristof Coussement, and Shasha Wang. 2024. “Information sharing and political polarisation on social media: The role of falsehood and partisanship.” *Information Systems Journal,* 34, 3, 854–893.

Aleksandra **Urman**, Mykola **Makhortykh**, and Roberto **Ulloa**. Oct. 1, 2022. “The Matter of Chance: Auditing Web Search Results Related to the 2020 U.S. Presidential Primary Elections Across Six Search Engines.” *Social Science Computer Review,* 40, 5, (Oct. 1, 2022), 1323–1339. Publisher: SAGE Publications Inc. doi: 10.1177/08944393211006863.

Aleksandra **Urman**, Mykola Makhortykh, Roberto Ulloa, and Juhi Kulshrestha. Aug. 2022. “Where the earth is flat and 9/11 is an inside job: A comparative algorithm audit of conspiratorial information in web search results.” *Telematics and Informatics*, 72, (Aug. 2022), 101860. doi: 10.1016/j.tele.2022.101860.

**Rekker**, 2022. “factual belief polarization” *Journal,* (Mar. 11, 2022), 1–22. doi: 10.1017/npt.2024.4

**Budak**, Ceren, Brendan Nyhan, David M. Rothschild, Emily Thorson, and Duncan J. Watts. 2024. “Misunderstanding the harms of online misinformation.” *Nature* 630, no. 8015 (June 6, 2024): 45–53. ISSN: 0028-0836, 1476-4687, accessed June 10, 2024. https://doi.org/10.1038/s41586-024-07417-

# Positive outlook

- The **majority of search results are from decently credible and not politically biased domains**.
- Major search engines do not significantly amplify user negativity
  - Google and Bing comparatively unaffected by inflammatory queries

**Bing and Google**

- Seem to push users to moderate content even when user inserts a very negative query

**Mojeek and Yandex**

- Show more polarising content to neutral users
- Mirror or amplify polarising content when a query is negative.

# Concerns

- User's choice of search engine is a major determinant, even **more so than what they actually search for** (query polarity).
- Using **fringe search engines** amplifies exposure to problematic, potentially polarizing content.
- Implications for the **fragmentation** of the web, **factual belief** polarization, and the **post-truth** society.
  - Rise of alt-tech services, “splinternet”
  - Users play a primary role in determining their own exposure to polarizing content, but some search engines might amplify existing polarization

# Bonus content

# Beyond the presentation

Our paper also examined:

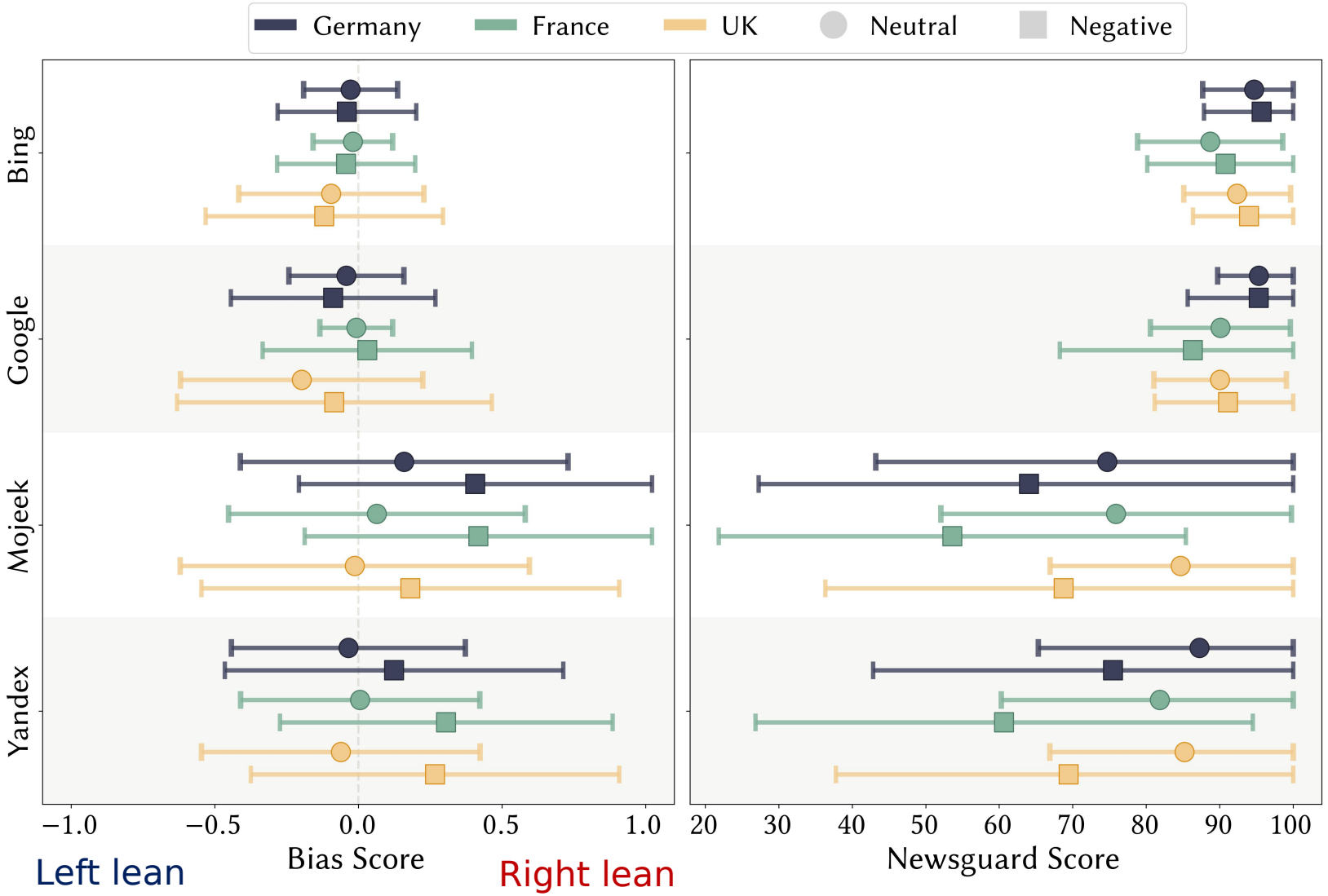
- Disinformation and conspiracy content,
- Trends in the ranking of results,
- Queries about known anti-LGBTQ+ extremists,
- Which queries were the most likely to result in polarizing search results?

# Example: Yandex domains that mainly appear for negative queries

| ID | negative | neutral | difference | Wiki Blurb | vsGuard_Sc | guard_Orier |
|---|---|---|---|---|---|---|
| reddit.com | 1272 | 254 | 1018 | Reddit () is an American social news aggregation, content rating, and forum social network. | | |
| youtube.com | 5181 | 4180 | 1001 | YouTube  is an American online video sharing platform owned by Google. | | |
| thepinknews.com | 1247 | 460 | 787 | PinkNews is a UK-based online newspaper marketed to the lesbian, gay, bisexual, transgender, queer, and questioning community (LGBTQ+) in the UK and worldwide. | | |
| lifesitenews.com | 333 | 22 | 311 | No wiki found. | | |
| advocate.com | 468 | 172 | 296 | The Advocate is an American LGBT magazine, printed bi-monthly and available by subscription. | | |
| naturalnews.com | 323 | 35 | 288 | Natural News (formerly NewsTarget, which is now a separate sister site) is a fa… | | |
| dailymail.co.uk | 748 | 476 | 272 | MailOnline (also known as dailymail.co.uk and dailymail.com outside the UK) is … | | |
| thefederalist.com | 254 | 46 | 208 | The Federalist is an American conservative online magazine and podcast that covers politics, policy, culture, and religion, and publishes a newsletter. | 12 | Right |
| dailykos.com | 293 | 87 | 206 | Daily Kos ( KOHZ) is a group blog and internet forum focused on the U.S. Democratic Party and progressive liberal American politics. | 45 | Left |
| breitbart.com | 264 | 62 | 202 | Breitbart News Network (; known commonly as Breitbart News, Breitbart, or Breit… | 50 | Right |

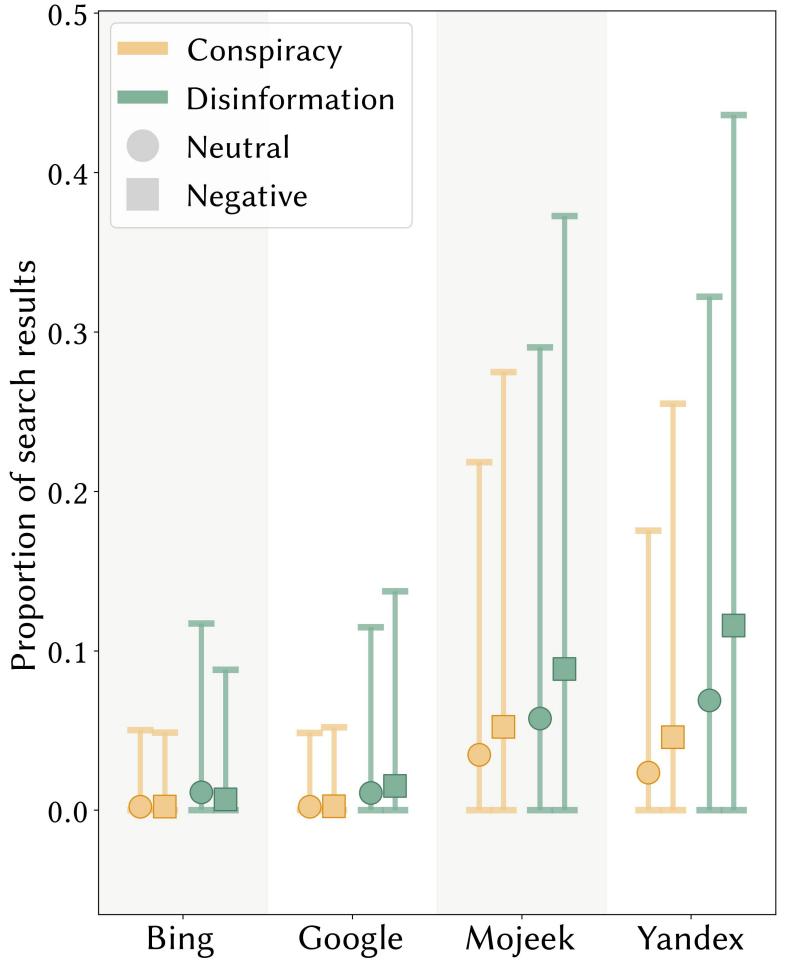
We can only show 3 examples of NewsGuard Scores

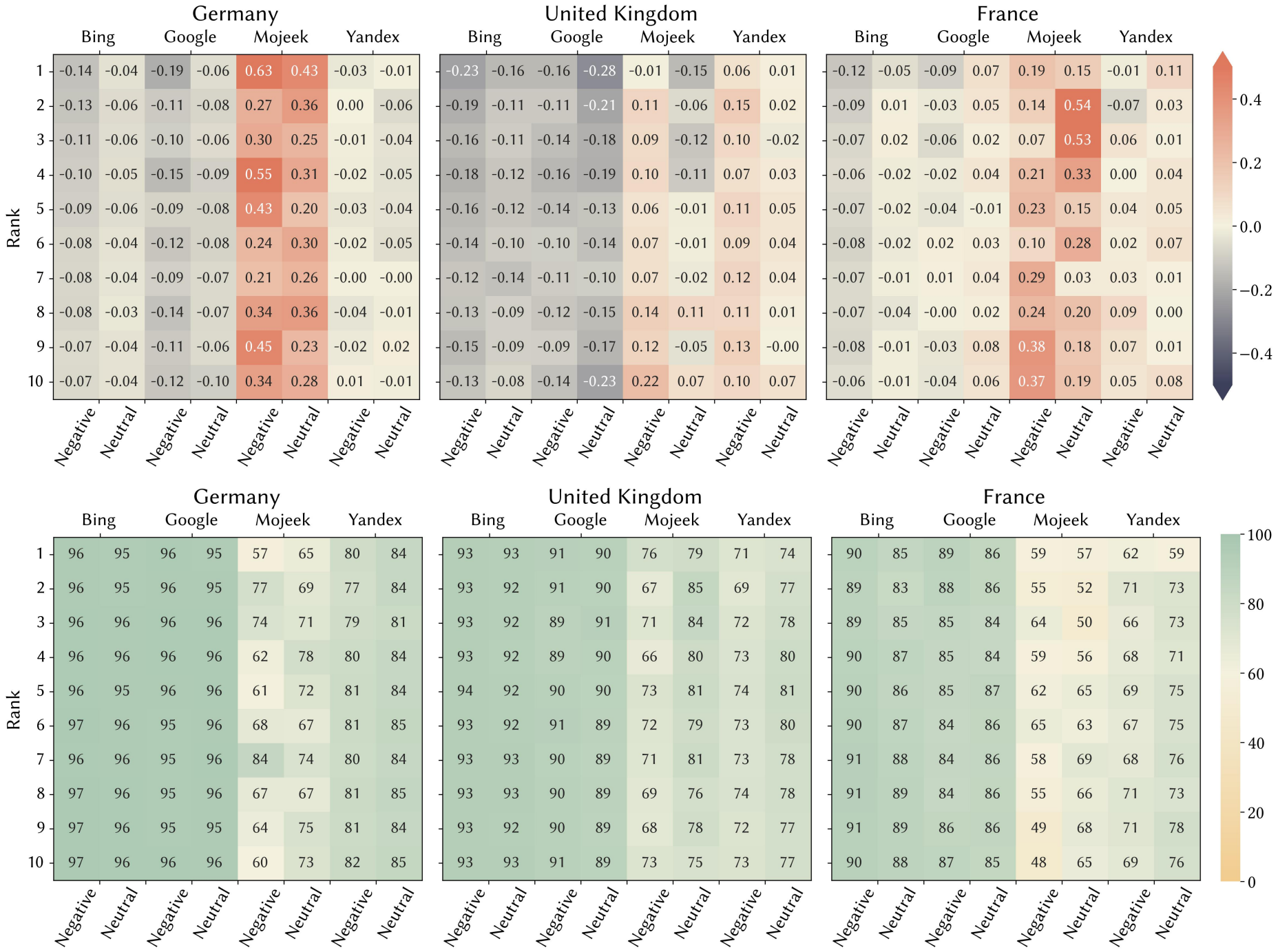
# Results - User input




Left lean

Right lean




Germany
United Kingdom
France
Bing
Google
Mojeek
Yandex
Rank
1 -0.14 -0.04 -0.19 -0.06 0.63 0.43 -0.03 -0.01
2 -0.13 -0.06 -0.11 -0.08 0.27 0.36 0.00 -0.06
3 -0.11 -0.06 -0.10 -0.06 0.30 0.25 -0.01 -0.04
4 -0.10 -0.05 -0.15 -0.09 0.55 0.31 -0.02 -0.05
5 -0.09 -0.06 -0.09 -0.08 0.43 0.20 -0.03 -0.04
6 -0.08 -0.04 -0.12 -0.08 0.24 0.30 -0.02 -0.05
7 -0.08 -0.04 -0.09 -0.07 0.21 0.26 -0.00 -0.00
8 -0.08 -0.03 -0.14 -0.07 0.34 0.36 -0.04 -0.01
9 -0.07 -0.04 -0.11 -0.06 0.45 0.23 -0.02 0.02
10 -0.07 -0.04 -0.12 -0.10 0.34 0.28 0.01 -0.01
1 -0.23 -0.16 -0.16 -0.28 -0.01 -0.15 0.06 0.01
2 -0.19 -0.11 -0.11 -0.21 0.11 -0.06 0.15 0.02
3 -0.16 -0.11 -0.14 -0.18 0.09 -0.12 0.10 -0.02
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9 -0.08 -0.01 -0.03 0.08 0.38 0.18 0.07 0.01
10 -0.06 -0.01 -0.04 0.06 0.37 0.19 0.05 0.08
0.4
0.2
0.0
−0.2
−0.4
Negative
Neutral
Germany
United Kingdom
France
Bing
Google
Mojeek
Yandex
Rank
1 96 95 96 95 57 65 80 84
2 96 95 96 95 77 69 77 84
3 96 96 96 96 74 71 79 81
4 96 96 96 96 62 78 80 84
5 96 95 96 96 61 72 81 84
6 97 96 95 96 68 67 81 85
7 96 96 95 96 84 74 80 84
8 97 96 95 96 67 67 81 85
9 97 96 95 95 64 75 81 84
10 97 96 96 96 60 73 82 85
1 93 93 91 90 76 79 71 74
2 93 92 91 90 67 85 69 77
3 93 92 89 91 71 84 72 78
4 93 92 89 90 66 80 73 80
5 94 92 90 90 73 81 74 81
6 93 92 91 89 72 79 73 80
7 93 93 90 89 71 81 73 78
8 93 93 90 89 69 76 74 78
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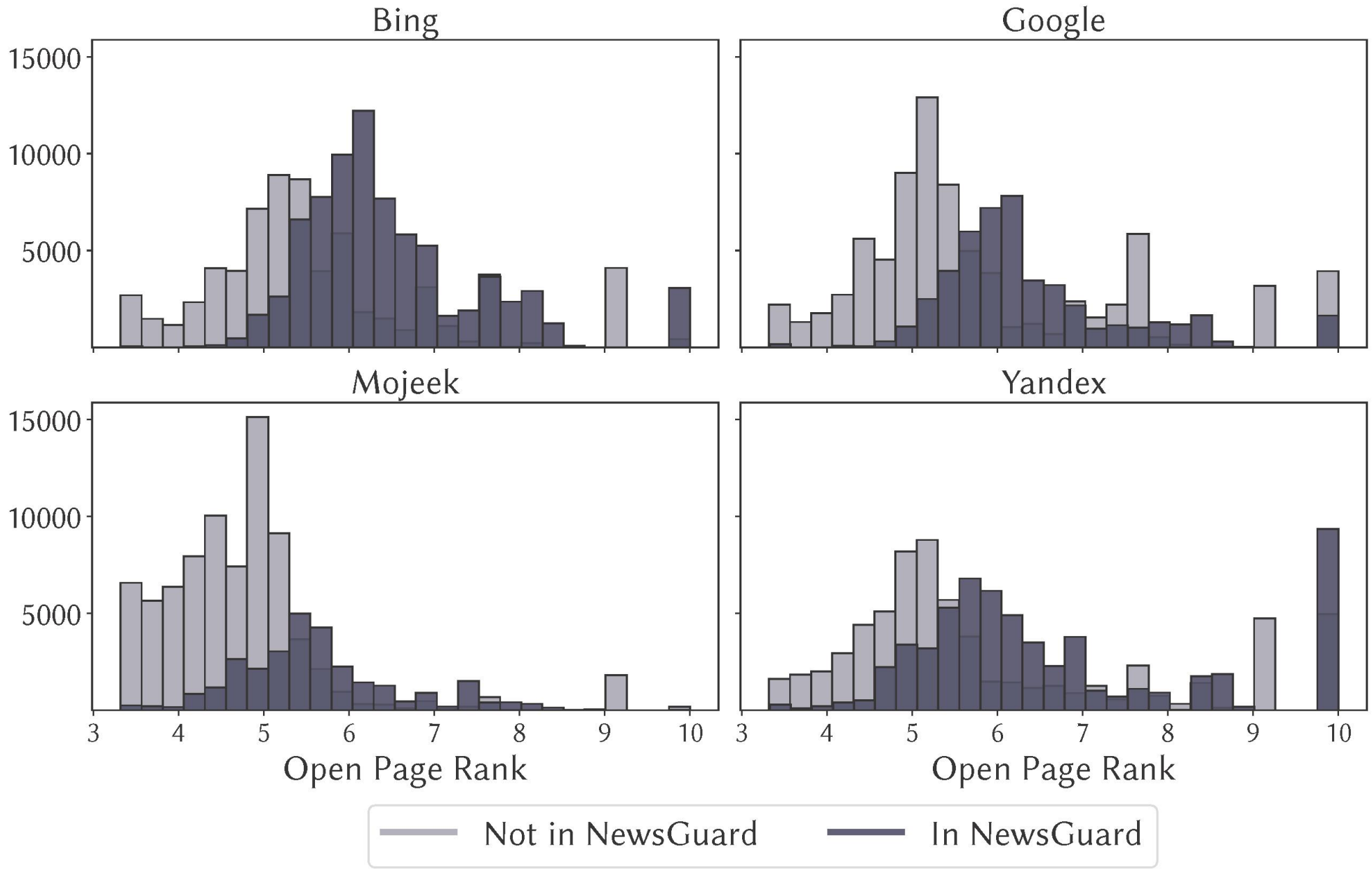
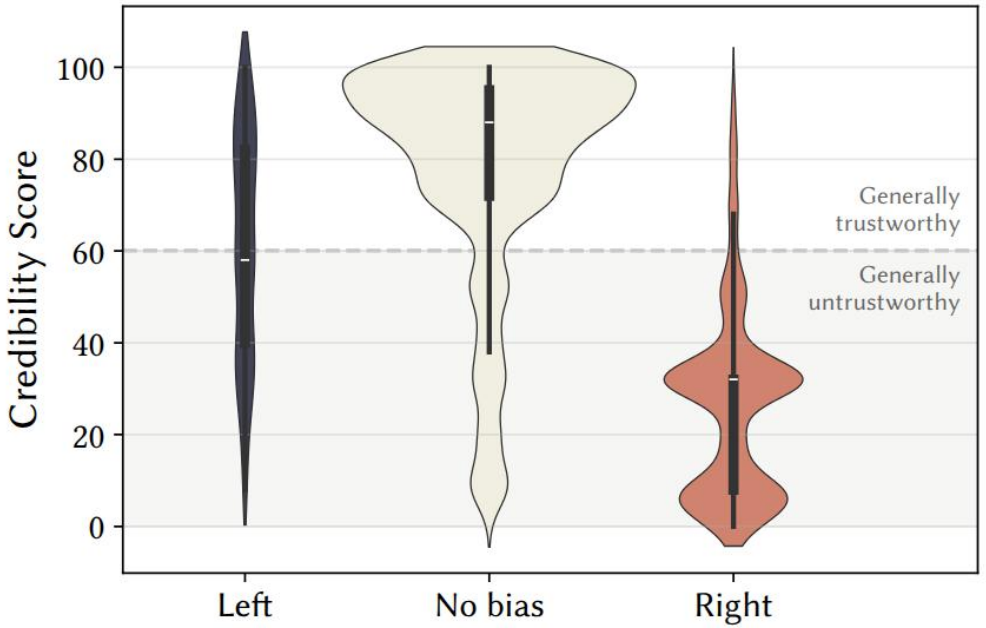
2 89 83 88 86 55 52 71 73
3 89 85 85 84 64 50 66 73
4 90 87 85 84 59 56 68 71
5 90 86 85 87 62 65 69 75
6 90 87 84 86 65 63 67 75
7 91 88 84 86 58 69 68 76
8 91 89 84 86 55 66 71 73
9 91 89 86 86 49 68 71 78
10 90 88 87 85 48 65 69 76
100
80
60
40
20
0
Negative
Neutral

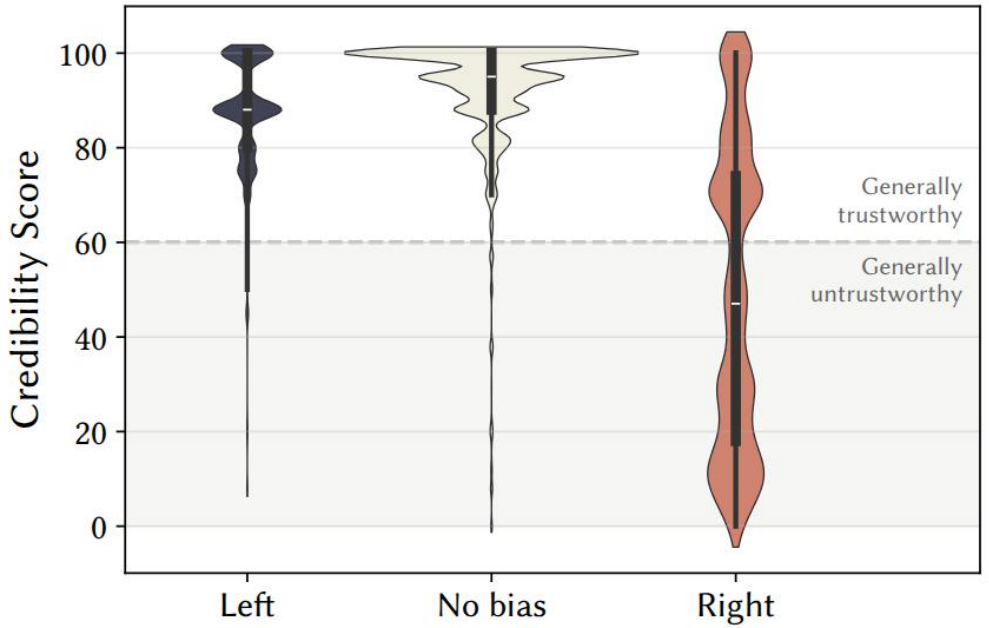
Open Page Rank of search results in our dataset



# NewsGuard's label distribution




(a) Credibility per political orientation label in NewsGuard.




(b) Credibility per political orientation label in search results.

Fig. 13. Shows the distribution of credibility scores per political orientation label in (a) NewsGuard and (b) our search result data set (across all countries, search engines, and query polarities). All labels are determined by NewsGuard. For left-leaning sources, search results cluster content at high credibility scores, while the scores are evenly spread in NewsGuard's labels. For sources with no bias, the vast majority is situated between a score of 80 to 100. There are some sources under the threshold however. Regarding the right-leaning sources, there is an even spread of content across the whole range of credibility scores in search results, but scores are concentrated beneath NewsGuard's trustworthiness threshold in NewsGuard's distribution. All search engines display more high-credibility content for all political leanings compared to the base distribution of NewsGuard.

Table 8. Coverage of NewsGuard per Country

| | Search results with metadata | Search results without metadata | Percentage of search results with metadata | Unique domains with metadata | Unique domains without metadata | Percentage of domains with metadata |
|---|---|---|---|---|---|---|
| DE | 82732 | 137352 | 37.6% | 692 | 6299 | 9.9% |
| FR | 43608 | 77298 | 36.1% | 539 | 4422 | 10.9% |
| UK | 88345 | 131982 | 40.1% | 949 | 7094 | 11.8% |

Table 9. Coverage of NewsGuard per Search Engine

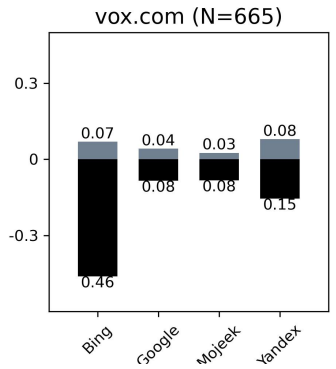
| | Search results with metadata | Search results without metadata | Percentage of search results with metadata | Unique domains with metadata | Unique domains without metadata | Percentage of domains with metadata |
|---|---|---|---|---|---|---|
| Bing | 77290 | 75698 | 50.5% | 761 | 3901 | 16.3% |
| Google | 47333 | 88174 | 34.9% | 697 | 4714 | 12.9% |
| Mojeek | 29440 | 107922 | 21.4% | 691 | 7107 | 8.9% |
| Yandex | 60622 | 74838 | 44.8% | 1013 | 5153 | 16.4% |

# What domains stop or start appearing when the query is negative?

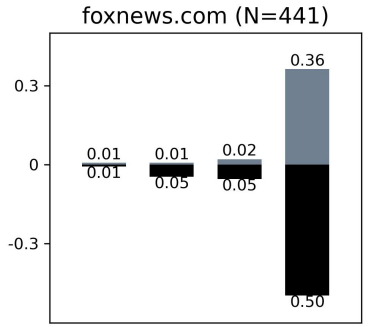
Popular and no disinformation

Vox.com (left bias) is mainly shown by Bing for negative queries

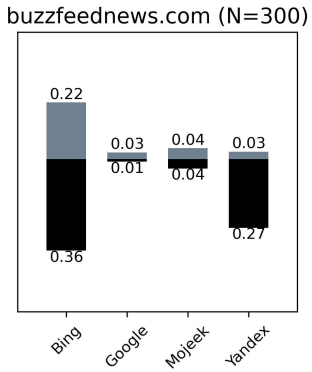
Potentially nudging?

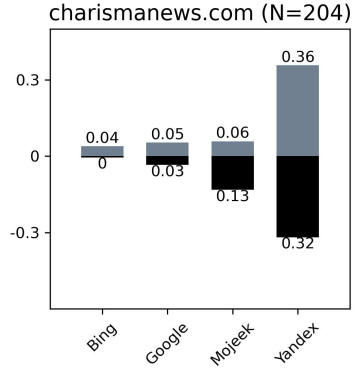



Popular and with disinformation




Yandex shows foxnews.com (right bias) the most, and especially when queries are negative

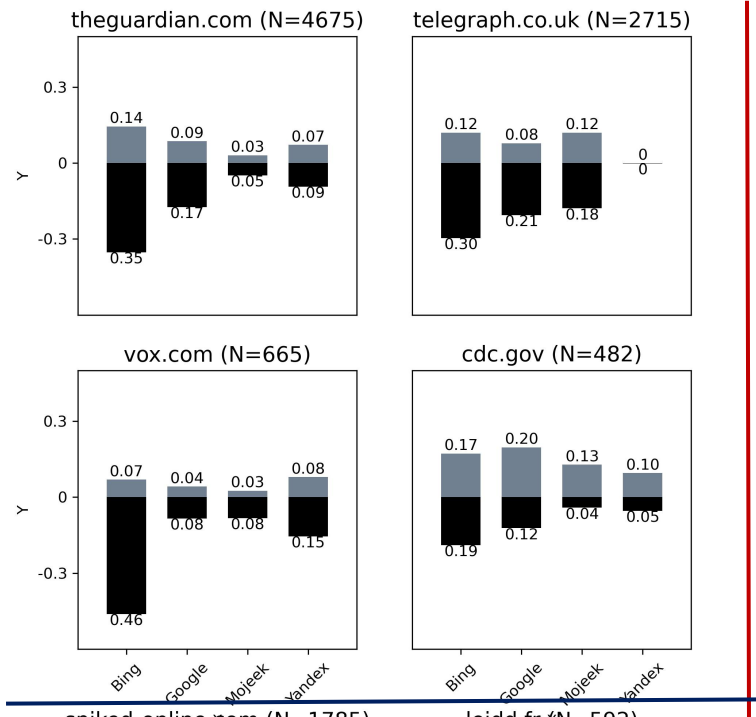


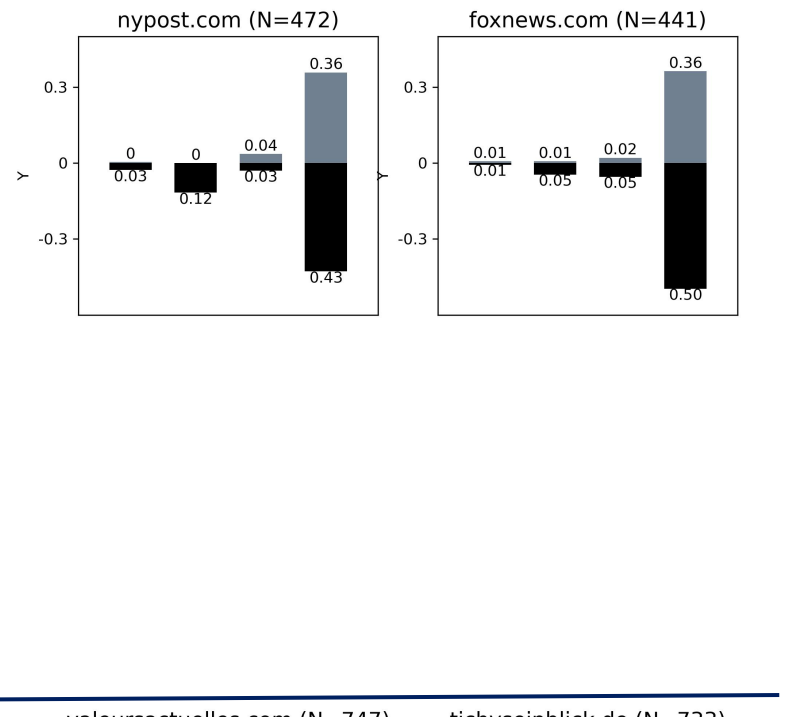

Unpopular and no disinformation

Unpopular and with disinformation

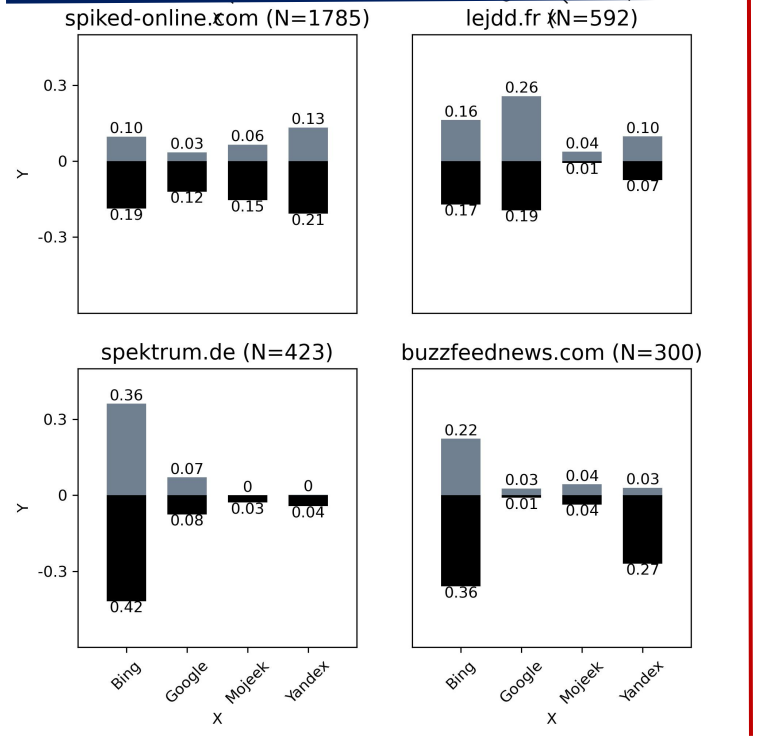
Popular and no disinformation



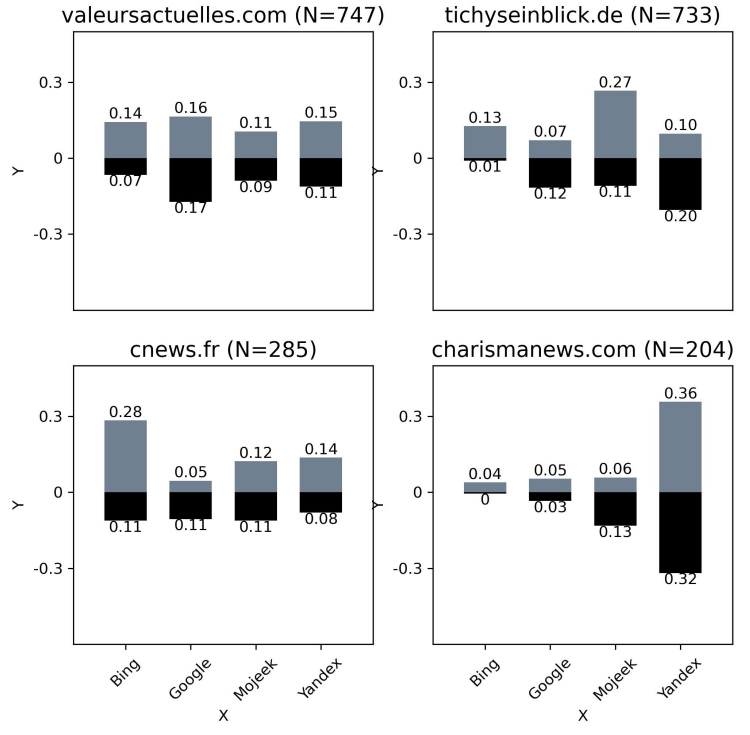

Popular and with disinformation




Unpopular and no disinformation




Unpopular and with disinformation



# Types of disinformation per query polarity

