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*SEO effects and the question of Google's content moderation*

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# Fact-checks versus problematic content in search rankings: SEO effects and the question of Google’s content moderation

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## ABSTRACT

This study investigates the ranking of problematic content and fact-checks of that content in Google Web Search results, examining their competition. The analysis is based on over 825 URLs extracted from Google Search Engine results pages (SERP) using 50 thematic keywords derived from fact-checked content. It reports findings on both the rankings as well as the levels of SEO optimisation of problematic content and the fact-checks. Our investigation found that fact-checks enjoy greater visibility in Google Web Search compared to the articles they seek to correct, both in terms of frequency of appearance and their placement within the SERP rankings. Specifically, our study shows fact-checks rank higher than problematic content across five topical keywords groups, Covid-19, climate change, the war in Ukraine, U.S. liberals and U.S. elections, except in contested stories related to the war in Ukraine, where articles about U.S. bio-labs share equal prominence with their corresponding fact-checks. The findings imply Google moderation effects, as fact-checking content is more prominent given (nearly) equal levels of optimisation. It also implies that fact-checks are generally more prominent for audiences searching for problematic content, though both often appear in the same SERP. Navigational queries (e.g., searching for the name of a source and that content) reduce moderation effects.

## CCS CONCEPTS

• **Information systems** → Page and site ranking; *Presentation of retrieval results.*

## KEYWORDS

fact-checking, problematic content, SEO, content moderation, Google Web Search visibility

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## 1 INTRODUCTION

Fact-checking is one of the principal forms of mitigation against the spread of misinformation online. In response to regulatory pressures aimed at curbing its spread, over the past few years major tech companies have engaged the services of fact-checking organisations to reduce the levels of misinformation on their platforms [12]. The fact-checkers publish ‘fact-checks’ or stories that correct or debunk published posts. These are labeled and linked to the ‘problematic information’, or content that is ‘inaccurate, misleading, inappropriately attributed, or altogether fabricated’ [26]. The goal is to correct the record, and to the extent possible, reduce the circulation of the misinformation [28]. Indeed, such labeling influences algorithmic content recommendations on some platforms as Facebook, reducing its prominence in the feeds [13].

While fact-checking on social media and its effectiveness have been the subject of a growing body of scholarly research, there is a noticeable research gap in the context of web search. In part, this lacuna can be attributed to the main location and funding source of fact-checking activities. At least in the contemporary period, ‘fake news’ after all was first attributed to Facebook posts [61], and according to industry sources, Meta’s Third Party Fact-Checking program has been the leading funding source for fact-checkers, contributing at one point to nearly 50% of their total income [46].

While Google has created a fact-check search engine as well as a markup tool for fact-checking organisations to tag their fact-checks as such so that they appear more prominently in the SERP, there is currently no equivalent large-scale effort by Google (or other major search engines) to fund or otherwise open the platform to them in a similar manner [36] [53].

Despite the popularity of using social media for querying information and the challenges posed by the advancement of language model-based chatbots, Google Web Search currently maintains its dominance as the primary tool for online search. Google’s market dominance is crucial to its success, but its reputation for reliability plays a role here, as users often express a high level of trust in the credibility of its results, including its ranking practices [44].

At the same time, malicious and entrepreneurial actors are committed to exploiting that trust, using well-constructed websites to spread online misinformation [1][23]. Indeed, there is evidence that manipulating the organic results of search engines has become a strategy for increasing discoverability; a significant portion of the traffic to dubious websites, frequently scrutinised by fact-checking efforts, can be attributed to organic searches [4][5]. Yet, as said, Google Web Search remains among the least studied platforms concerning online misinformation [52] and, as we address in this study, that includes the visibility of fact-checks compared to problematic, fact-checked stories within it.

This leads us to the question of whether the discoverability of fact-checking content is any better than that of the content it tries to correct. A comparative study would include the extent to which each is optimised for the search engine to index and rank it as well as content moderation effects, or at least indications thereof.

Along those lines, in this study we pose the following questions.

- (1) Does the content that fact-checkers strive to correct perform better or worse than the fact-checks on Google Web Search?
- (2) To what extent do fact-checking websites as well as those with problematic content employ search engine optimisation (SEO)?
- (3) Are there indications that Google is moderating misinformation more for one topic area than for another, where such indications could be the comparative quantity of problematic URLs returned as well as the rankings of the sites given equivalent levels of optimisation?
- (4) Are there particular query types where problematic content outperforms fact-checking content (and vice versa)?

To answer these questions we conduct a comparative analysis of their Google rankings and levels of optimisation in order to determine the visibility of fact-checks and the problematic content they check as well as content moderation effects. Concretely, we scrutinise the relative visibility of fact-checking content within search engine results pages (SERP) compared to the content it seeks to correct by comparing their rankings [50]. We do so across a number of topic areas, discussed below. We then determine the performance of the two content types by studying the SEO levels of their respective domains. This analysis subsequently serves as a means to develop indications of Google's content moderation per topic area. It is also a proxy for evaluating the effectiveness of fact-checking organisations as well as misinformation purveyors in engaging with audiences through web search, which is where we conclude.

The paper proceeds as follows. First, we provide a brief review of research concerning the prevalence of problematic content within Google Web Search as well as a summary of factors determining prominence in SERP. Subsequently, we provide an overview of the method, which repurposes SEO professional practices in line with recent scholarly work doing the same [57] [74] [35]. We then elaborate on the findings related to a) misinformation and the performance fact-check content by topic in Google SERP and b) SEO performance of misinformation and fact-checking domains in Google SERP. Examining the rankings as well as levels of optimisation of problematic sources compared to fact-checkers, we provide indications of where Google's content moderation is focused and (somewhat) less focused.

In all we found that the fact-checks are generally outperforming the content they are seeking to correct with the exception of stories related to the war in Ukraine, where articles discussing presence of U.S. funded bio-labs are almost as visible as content that contests that information. Stories concerning Covid-19, climate change, U.S. elections, and U.S. liberals are notably well-moderated, with fewer problematic sources returned for queries related to these topics. Moreover, fact-checking websites tend to rank higher for queries associated with these subjects. We also found that 'navigational queries' (where a source is named together with the problematic

content) results in fact-checks ranking lower than the stories they seek to correct.

In all, fact-checks currently enjoy a boost from Google, but at the same time users can still find dubious content in certain areas (U.S. bio-labs in the context of the war in Ukraine) as well as via data voids and navigational queries. Our findings imply that fact-checkers could supply additional content, marked up for Google, that address these areas.

## 2 RELATED WORK

### 2.1 The presence of problematic content in Google Web Search

The study of the discoverability of problematic content within Google Web Search is inevitably linked to the issue of 'quality', a pivotal concept within the realm of modern information retrieval related to searching the web [2] [76]. As a result, the presence or absence of quality also has framed recent research related to the role of commercial search engines in the dissemination of problematic content. Studies examining the presence of low quality content have introduced a variety of terms and definitions (e.g., 'fake news' and 'junk news') and have discussed the stakes of their discoverability in the context of health as well as political information [66] [4].

For instance, Schultheiß et al. [55] found that potentially harmful medical content was visible and accessible through Google Web Search, according to the study's participants, who were asked to rate the quality of web pages returned based on attributes of 'trustworthiness, expertise, objectivity, transparency, familiarity, understandability, and relevance'. For political information, for example, Torres and Rogers [68] assessed the visibility of 'hyper-partisan' content in Google Web Search related to the Dutch provincial and European parliamentary elections of 2019, finding that it ranked highly for queries for certain right-of-center politicians and issue frames. The analysis worked with both Silverman [61]'s definition of 'fake news' (which included hyper-partisan sources) as well as Howard et al. [25]'s junk news, characterised as including 'extremist, sensationalist, conspiratorial, and masked commentary'. A comparable concern regarding the editorial quality of information retrieved from Google was shared by Zade et al. [75], who found a proportion of Google Search headlines could erode user trust in the legitimacy of the 2020 U.S. election. As discussed below in our analysis, Google has termed such information 'borderline content' and has sought to moderate it [20].

In terms of methodology, the examination of the quality of Google results has been approached using various techniques, including API calls, data donations as well as scraping [70]. While Google provides the Google Search API for retrieving and displaying search results to developers, it has been noted that the results are not presented in the format required by some researchers [75]. API calls also do not yield results users actually would see, whether they are logged into Google or not, given geographical as well as other forms of personalisation [52]. Especially the effects of personalisation and the 'filter bubble' but also other quality questions have been studied through data donations [42] [48]. Given that they are gathered with browser extensions (by consenting users), it is challenging to scale the number of participants and achieve a balance between sides of the political spectrum, with some exceptions [40].

Most recently, search engine researchers (especially from the social and information sciences) employ methods referred to as algorithmic auditing [54] [73], where data are often collected through basic screen-scraping techniques. Scraping often involves the use of purpose-built tools for extracting HTML code [34], such as the Search Engine Scraper [52], the Result Assessment Tool [65] [35] as well as third-party commercial services such as SerpApi [59]. Additional computational techniques include the use of virtual agents [39] [71], which among other applications allows for comparing outputs from different online recommendation systems in order to study privileged information and biases [32] [51].

## 2.2 Visibility enhancement in Google Web Search

While there is scholarly work on the ranking and privileging mechanisms of Google as well as other recommendation systems online, there remains a notable gap regarding the efforts made by publishers and SEO specialists. Of that work, most scholarly literature on SEO has been focused on the analysis of factors that enhance individual website visibility rather than on the impact of search engine optimisation on the discoverability of informational content [33]. One of the reasons for the emphasis on the examination of individual websites has to do with the lingering stigma surrounding SEO as a technique of 'gaming' search results rather than complying with Google standards [42]. Furthermore, there is limited scholarly access to multi-use tools for identifying and reverse-engineering SEO practices [22].

Nonetheless, for some time now it has become evident that SEO tactics are extending beyond the realm of optimising commercial sites or playful trolling like 'Google bombing' [3]. They are increasingly influencing informational areas of the web, including the ranking of dubious sources [4]. One prime illustration of this shift is the rise of COVID-19 misinformation embedded in informational formats, where so-called 'rogue doctors' use blogs to spread harmful medical falsehoods [15]. Such developments have extended the scope of examinations of Google's recommendation methods in the context of online health information seeking behaviour (OHISB) [55] [64] [38].

Of comparable significance are recent efforts pertaining to the exploration of results queried with long-tail, problematic, or otherwise rare terms. For example, Norocel and Lewandowski [43] employed extreme-right 'red pill' words to prompt Google Web Search to return fringe content of limited societal relevance, commonly referred to as 'data voids' [18]. While not explicitly categorised as such, the intentional creation of content tailored to correspond with such terms could be considered a kind of SEO strategy. That is, both the visibility of data void content as well as the level of interest in such terms (akin to content associated with branded terms) are manufactured. The increasing influence of these strategies on Google Web Search results – or what was once thought of as SEO marketing tactics – has led to calls for reevaluation and better scrutiny of 'risk' within online recommendation systems, particularly Google's [22]. It especially obtains in the context of publishers who advise or comment on consequential topics, but who lack subject expertise to do so [35].

Beyond its use in the context of commercial operators and misinformation spreaders, SEO practices are prevalent behind the scenes in the dissemination of news content on Google, another informational space [10] [11] [17]. Optimisation here extends beyond the practices behind the discoverability of a website in Google Web Search. Rather, it involves content shaping as optimisation, with a greater reliance on web analytics [67] [17] [31]. It is a sensitive subject matter in the newsroom, given the perception of potential norm breaches. Journalists are hesitant to introduce analytics-driven working methods into their routines, as they often lead to concerns of 'topic setting' and even 'gaming' journalistic principles [56].

Some media organisations and fact-checking bureaus do make use of such optimisation practices. For example, media organisations may seek to enhance their visibility in Google rankings for current or popular queries, such as 'fact-checking the presidential debate' [21]. They will publish so-called 'story shells' in advance of the debate to secure a desirable position in Google Web Search rankings. Fact-checking bureaus are known to use structured data markup on their pages so that a summarised version of their fact-checks will be featured as indented search results on Google. Such formatting practices optimise their content so that it becomes part of Google's ClaimReview, one of its method of promoting fact-checks in SERP [17]. As a case in point, the fact-checking organisation, Full Fact, has a ClaimReview field markup added directly to its content management system [45].

## 3 METHODOLOGY

The methodology employed combines the use of Duke Reporters' Lab and Meta's lists of fact-checking websites and fact-checked stories (the problematic information) with professional SEO practices that we have repurposed, following the work of Schultheiss et al. [57] [55]. In order to study the competition in ranking between fact-checks and the problematic stories that were fact-checked, we first built a corpus of SERPs by querying keywords found on the problematic web pages where they would be strategically inserted in accordance with industry standards. We sorted the results by topics and then compared the rankings of fact-checks and the problematic stories per topic. We subsequently employed website scanning software to determine the level of search engine optimisation of both kinds of web pages. With this information we are able to provide indications of Google's content moderation per topic. Principally, we note that the absence of problematic sources present for certain topics over others and their rankings, despite optimisation. We detail this methodology further below.

### 3.1 Data collection

We started the data collection by sourcing a set of URLs from Meta's 'URL Shares' dataset [69] with the objective to obtain claims verified by fact-checkers (between 1 March and 31 October 2022). To narrow our focus specifically to claims accessible through search engines, we excluded URLs from social media domains and online video platforms. This selection resulted in a data set of approximately 500 web page URLs that had been shared on Facebook, either in regular posts or as link posts, each receiving more than 100 shares.

In addition, to ensure these website URLs had a chance to rank on Google, we checked them with a website crawler called The Screaming Frog SEO Spider, an SEO industry standard site audit tool [6]. Conducting this step was essential for establishing which stories would appear in Google SERP. Next, we used the Screaming Frog crawler's output, which includes web page titles, and ran it through Google Translate's language detection function in Google Sheets to determine the languages in which the content was written. Our assessment of the page titles revealed that the majority of the content verified by fact-checkers was written in English (n=141), leading us to focus on indexable stories accessible through English-language search queries.

### 3.2 Query formulation

Subsequently, we conducted an examination of the article contents, categorising them into five thematic groups that consistently emerged: Covid-19, climate change, U.S. liberals, U.S. elections, and the war in Ukraine. In each of the thematic categories, we selected 10 articles at random for a secondary 'SEO reading'. For each of these chosen articles, we composed a set of 10 search queries, using SEO reverse engineering practices discussed in detail below. All those queries were made to create the corpus for extracting Google Web Search results. While formulating these queries we adhered to the principles of a) query popularity and b) topic coverage outlined by Schultheiß et al. [57].

Since the purpose of this research is to assess the levels of SEO optimisation, we approached the selected articles with the presumption that they had already undergone SEO optimisation. Under this assumption, we anticipated how hypothetical SEO specialists working with this content would strategically incorporate important keywords into the text. These strategic keyword insertions would be placed in accordance with the industry practices of content optimisation, in elements such as headers, title tags, and URL paths. Important keywords would also be used sparingly in the article body [6]. Even in the absence of optimisation, the places where the keywords were extracted would hold significance for Google ranking algorithms.

We designed our query list by extracting keywords from these important web page elements. In addition, we also included queries that stood out as potential data voids, that is, low volume queries or entirely new terms that could have been crafted by media manipulators to encourage further activity on search engines [18]. To ensure each theme topic was covered, we established a maximum limit of ten keywords and keyword variations per article. Following a duplicate check, the query design phase concluded with a corpus of 497 distinct queries.

### 3.3 Collecting Google results

While there exists a Google Search API designed for developers that could be repurposed, given the issues with it, as discussed above, we instead used a Python script that automatically queried Google via the ValueSERP API infrastructure that performs the scraping tasks [72]. We used it to harvest the first ten organic SERP results for 497 unique queries. Since most of the analysed articles are from U.S.-registered websites, and often discussed issues concerning the U.S., we set the ValueSERP scraper's parameters to retrieve results

from the US-en market. We also set it to imitate desktop searches, given that in the next step we are assessing their optimisation for desktop rather than mobile. The scraping activity took place on 3 August, 2023 and thus the analysis reflects that specific time frame.

### 3.4 Analysis of websites' SEO performance

Our analysis began by examining the ranking results obtained from the collection of data consisting of 4,970 web page URLs. Each URL was accompanied by a rank, or a numerical value between 1 and 10 (since we only requested first-page Google Web Search results), indicating its position in the SERP (for that day). We aggregated the ranking scores for each topic and domain, enabling us to determine their average positions in the SERP.

We categorised these pages into groups, namely fact-checks, problematic stories, and other. These were cross-referenced with existing lists of fact-checking domains from aggregated lists from Duke's Reporters Lab [30] and Meta [41]. We then ran the results through lists of labelled websites by the GATE domain URL analysis service from the University of Sheffield [60] as well as Media Bias/Fact Check media monitoring site [14]. Included in the annotations by Media Bias/Fact Check are the sources labelled as questionable, pseudo-science, satire, or conspiracy with very low, low or mixed quality content scores [14]. Note that satire may be checked by fact-checkers, as per the domains listed by Meta that undergo fact-checking. We concluded the labelling stage by distinguishing between web domains categorised as fact-checks (41 domains) and those disseminating content contested by fact-checkers and media monitoring organisations (46 domains) (see Zenodo data set [29]).

The next step is to analyse the extent of search engine optimisation of these domains. We accomplished this task by using the SEO Site Checkup[8], an industry standard SEO audit tool [16]. This tool audits websites according to the guidelines set forth by Google Search Essentials [19]. These are classified into distinct groups that correspond to different types of factors, including 'common SEO issues', 'speed optimisations', 'server and security', and 'advanced SEO'[8]. We followed the 'SEO Site Checkup' methodology to assess domains' compliance with Google's ranking indicators, with the exception of 'mobile usability', since we had initiated only desktop searches in our data collection. This resulted in a checklist of 60 technical and content optimisation factors (see Appendix).

We then gathered the SEO optimisation scores for the 87 domains in our sample by assessing the number of errors and warnings from the 60 factors, represented in percentages. The highest optimisation level registered in our sample is 82%, indicating a 18% error rate, while the lowest is 52%, with a 48% error rate.

It is worth noting that this method for checking the SEO optimisation levels shares many of the factors used in similar work by Lewandowski et al. [35], where the level of optimisation is assessed by automatic identification of SEO indicators. Finally, to compare the respective levels of visibility of these two types of publishers, we considered their SEO efforts (and adherence to Google Search Essentials), plotting their average base rank against the average optimisation levels for each topic group and content type (see Table 1 and Figure 1).

**Table 1: The competition between fact-checks and corrected content in Google Search. Source: Google, SEO Site Checkup. Date: 3 August, 2023**

Topic	Type	Avg. ranking	Optimisation score	Ranking URLs
CLIMATE	fact-checks	4.35	69%	103
CLIMATE	corrected content	6.18	67%	34
COVID	fact-checks	4.56	71%	151
COVID	corrected content	5.80	56%	25
US LIBERALS	fact-checks	4.32	67%	141
US LIBERALS	corrected content	6.25	61%	64
UKRAINE	fact-checks	5.07	66%	72
UKRAINE	corrected content	5.35	68%	72
US ELECTIONS	fact-checks	4.39	67%	160
US ELECTIONS	corrected content	9.25	67%	4

## 4 FINDINGS

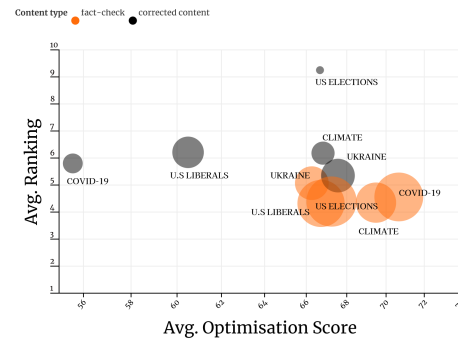
In the following we present our findings with respect to assessing the competition in SERP between fact-checks and the problematic stories addressed by them. We recognise the competition in Google Web Search results as one for search engine visibility, consisting of a variety of factors such as "unique keywords, positions, and URL results" appropriated by algorithms that rank and organise results [62]. Additionally, we examine visibility as a concept shaped not only by algorithms but also by publishers' efforts in search engine optimisation. Apart from discussing the rankings and levels of SEO by the fact-checks and the problematic content, in this section our aim is also to draw conclusions regarding the presence of content moderation.

We identify two principal indicators that suggest that content moderation is at work: a) a significant difference in the number of ranking URLs per content category within a topic, and b) instances where one type of content attains a higher rank despite having a lower or comparable optimisation score within a topic.

These indicators are applicable across all content types, but are expected to be in evidence for topics on websites that fall into Google's category, "Your Money or Your Life", or those with potential consequences for "health, financial stability, safety of people, or the welfare or well-being of society" [49] [62] [19]. We also expect them to be present for "borderline content", or what scholars have called "awful but lawful" material [37], to which Google seeks to "limit its reach" [20].

### 4.1 The competition between fact-checks and problematic stories in Google results

We found 627 fact-checks and 198 stories that fact-checkers sought to rectify. We also observed that, on average, fact-checks tend to outperform the problematic stories, as domains from fact-checking organisations usually appear higher in SERP rankings than the content they were addressing (with average rankings of 4.5 vs. 5.9) (See Table 1 and Figure 1). Optimisation levels vary somewhat across topics but generally are higher for fact-check articles. Their relative prominence is not decisive, however, given that the stories contested by fact-checkers often come from sources that are on

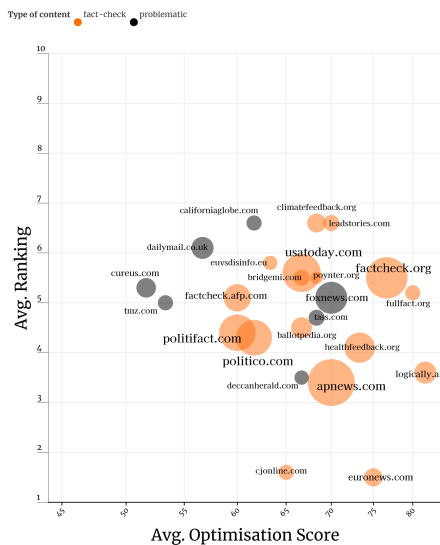


**Figure 1: The competition between fact-checks and corrected content in Google Web Search. Scatter plot of average optimisation score and average ranking for analysed topics. Size of the nodes representative of the number of URLs for each topic. Source and date: Google, 3 August, 2023**

average quite well optimised (such as *foxnews.com*, *datidicke.com* or *tass.com*).

The majority of recommended fact-checking content comes from prominent English-speaking news organisations (*reuters.com*, *ap-news.com*, *euronews.com*) and national media outlet (*usatoday.com*), well-established (*factcheck.org*) as well as specialised fact-checking institutions such as *healthfeedback.org* and *ballotpedia.org*. These sources exhibit good visibility in Google SERP rankings, with some occasionally albeit sporadically, appearing in Google's Golden Triangle of top three results [24] (see Figure 2). Stories contested by fact-checkers come from a variety of sources, although a similar pattern is observed.

In the context of Google's Search Engine Results Page (SERP), the results usually include an array of result types extending beyond the conventional organic listings (Table.2) SEO experts commonly refer to these expanded results as "rich snippets" [63] owing to their distinctive appearance in the SERP and often leading to a higher click-through rate compared to the standard organic results. Our study shows that fact-checks are mostly available through the organic results (n=573) in a standard, uninterrupted list of results



**Figure 2: Competition between fact-checks and corrected content in Google Web Search.** Scatter plot of average optimisation score and average rankings for analysed domains (filtered for domains with > 5 entries). Size of the nodes representative of the number of URLs from each source. Source and date: Google, 3 August, 2023.

[58]. The more visible snippets constitute only a small portion of fact-checking results; there were 33 instances of indented results, and less than 30 results in which fact-checks appeared in featured and people-also-ask (PAA) snippet paragraphs.

Stories contested by fact-checkers also were made accessible mainly via organic results (n=185). There were also instances, however, in which the visibility of contested stories was boosted by their appearance in Google Web Search through rich snippets. We observed 10 indented results, among which was the *foxnews.com* opinion piece implying the U.S. government is lying about the presence or its involvement in the development of bio-labs in Ukraine[7]. Another notable example comes from the *Cureus Journal of Medical Science*, where a report detailed the case of a woman who developed autoimmune hepatitis after receiving the first dose of the Pfizer-BioNTech vaccine [27]. The limited presence of rich snippets showcasing fact-checks somewhat diminishes the appeal of the ClaimReview Project [47], which aims to promote and highlight fact-checking articles in SERP. In addition, our study also indicates that, on average, most fact-checking publishers struggle to secure a placement within the Google Golden Triangle, or the top three positions recognised for attracting the most user attention[24] [58](Fig.2)

Among the five topics, queries related to Covid-19, climate change, U.S. liberals, and the U.S. elections consistently yield both more and better positioned fact-checking content compared to problematic sources (see Figure 1). The exception is content related to the war in Ukraine, where claims suggesting the presence of U.S.-funded

**Table 2: Comparative visibility of fact-checks and corrected stories per Google result type. Source and date: Google. 3 August, 20223**

Results type	Content type	Ranking URLs
featured snippets	fact-check	12
featured snippets	corrected content	0
indented results	fact-check	33
indented results	corrected content	10
organic results	fact-check	573
organic results	corrected content	185
people also ask (PAA)	fact-check	6
people also ask (PAA)	corrected content	3
review results	fact-check	3
review results	corrected content	0

bio-labs in Ukraine and Georgia experimenting with highly contagious 'plague' pathogens rank almost as high as stories trying to correct them. We briefly present findings concerning each of these topics in turn.

**4.1.1 Covid-19.** On average, fact-checking content around Covid-19 outperforms the claims it aims to correct, with an average ranking of 4.5 compared to 5.8. Furthermore, Covid-19 fact-checks are predominantly accessible through domains with robust SEO optimisation levels such as *fullfact.org*, *healthfeedback.org* and *factcheck.org* that garner an average optimisation score of 71%, compared to the competing sources with an average score of 55.5%. There is also six times more instances of corrective content around Covid-19 (n=151) than problematic stories (n=25). The difference in visibility between these two content types is striking, especially in an informational area of concern to Google content moderation [20].

**4.1.2 Climate change.** On average, fact-checks addressing climate change-related information receive a ranking of approximately 4.35, where competing narratives are notably less visible, with average rankings hovering around position 6. We found this result of interest, considering almost identical optimisation levels between the two. Climate debunking content originates from well-optimised domains as *logically.ai* and *factcheck.org*, which together have an average score of 69%. In contrast, contesting narratives from sites like *dauidicke.com* and *dailysceptic.org*, which challenge the "absurd scientific narrative" of human-made global warming, trail closely behind with a combined average score of 67%. Despite the nearly equal levels of site optimisation, fact-checks consistently outperform the scrutinised content.

**4.1.3 War in Ukraine.** The topic of the war in Ukraine was addressed by 72 fact-checking articles and, coincidentally, the same number of problematic articles in our sample, with the majority focusing on the alleged presence of bio-labs in Ukraine. fact-checks aimed at rectifying these claims have an average ranking score of 5.07, whereas the contesting content averages around 5.35. The SEO optimisation levels for fact-checking content, sourced from domains including *logically.ai*, *factcheck.org*, and *polygraph.info*, are nearly identical at 66% with optimisation levels of the content they aimed to correct, which is 68%. The latter content originates from

a wide range of domains which include state-sponsored and right-wing news sources that normally would be ranked highly for their perceived quality and relevance, such as *tass.com* or *foxnews.com* [39]. Applying our methodology for assessing SEO optimisation scores, the Russian news agency receives a high score of 68% and appears 10 times in the sample for queries such as "poltava bio laboratories" and "Pentagon funded bio-labs Ukraine". Taken together these factors suggest the content surrounding the war in Ukraine is not moderated as much as Covid-19 and climate change.

**4.1.4 U.S. liberals.** Content that aims to correct misleading information concerning U.S. liberals, including stories about President Joe Biden or Paul Pelosi achieve higher rankings than the false stories about them. On average, the corrective content related to U.S. liberals holds a ranking of 4.3, indicating that some of this content appears in the top positions on Google, compared to 6.2 for the contested content. There is a noticeable disparity in SEO optimisation levels between these two types of content. Fact-checks average a score of 67%, while corrected content lags behind at 60%, indicating presence of lower quality sources in the latter group, exemplified by sites like *tmz.com* and *realrawnews.com*. The difference in the quantity of URLs ranking in these two groups aligns with our observations about the moderation of stories related to Covid-19 and climate change. Specifically, there are at least twice as many corrective stories as there are problematic stories surrounding U.S. liberal policies and politicians.

**4.1.5 U.S. elections.** U.S. election-related fact-checks are visibly the largest thematic group, with a count of 160 organic search results ranking in the sampled SERP, compared to just 4 results featuring the content they aimed to rectify. It is noteworthy that the fact-checking content was accessible in SERP from domains that were optimised to the same extent as the domains hosting debunked content, with both achieving a score of 67%. The results appear to indicate content moderation, caution is warranted when making such comparisons, considering the significant differences in the number of ranking sites for these two types of content. The most prominent corrective domains were again *factcheck.org* but also *apnews.com* and *poynter.com*, whereas those that ranked high with content discussing the legitimacy of U.S. electoral system were among others *100percentfedup.com* and *dailysignal.com*. Google is known for actively moderating political content with the intention of preventing attempts to interfere with elections in paid ads [20] and from these findings appears to extend this scrutiny to Google Web Search, where, as we found, searchers are 40 times more likely to encounter corrective content than problematic stories for such content.

## 5 DISCUSSION

This paper introduces a method for scrutinising the competition between fact-checks and the stories they refute in Google Web Search. We examine what could be called the competition between the visibility of fact-checks and that of the problematic content they are striving to correct. We argue that by comparing rankings as well as their SEO scores, the method provides a means to study indications of Google's content moderation, asking the extent to

which it is susceptible to return lower quality content when fact-checks are available.

In order to empirically evaluate our method, we turn to data sets that contain a list of stories that have been fact-checked as well as a list of fact-checking organisations. Deploying professional SEO practices, we create queries (that have adequately described the stories) that return search engine results, which are then scrutinised. The results are sorted into fact-checks and problematic content (that is fact-checked), and divided into topics. Their rankings are also analysed. With these results we can begin to make findings concerning the visibility of fact-checks compared to the content they are correcting. Subsequently, we scan the html of these pages to deduce their levels of SEO optimisation. Taken together, these rankings and optimisation scores of fact-checks and problematic content enable us to discuss indications of Google's content moderation.

We are able to address existing research gaps concerning the impact of fact-checking and search engine moderation by evaluating the visibility of fact-checks within the context of the most widely used search engine. While the impact of Google in shaping its information environment regarding such consequential topics as Covid-19 was expected [64][52], our research substantiates the extent of this influence. We found the scope is not limited to consequential keywords, but entire topics.

To reiterate, we believe the signs of moderation are evident due to the relatively limited number of problematic stories available for queries for Covid-19, climate crisis, U.S. liberals and U.S. elections. Moderation signs are also evident given that both climate change and the U.S. elections are more likely to return fact-checking domains – and at higher positions – despite similar SEO optimisation levels of problematic sites. (The one exception where moderation signs are limited is the topic, war in Ukraine.)

Fact-checks are outperforming the content they are problematising, but users still have limited and rather specific options to avoid the fact-checks, be it through performing so-called 'navigational searches' (such as querying the names of the problematic sources) and querying content with 'data voids' [4]. Our findings then should be viewed in the context of other research that makes a plea for the search engine to prioritise trustworthy (but under-optimised sites) over commercial, optimised websites providing information in the same realm, such as on healthcare [55].

Our findings also should be seen in light of the work by Zade et al. [75], who found that during the context of the 2020 U.S. presidential elections users could still access misleading content that undermines civic trust, but only if they actively searched for it. We would add that searches for problematic stories (that are not navigational or data void queries) also would turn up the highly ranked fact-checks.

What we found is also consistent with the research by Urman et al. [71] who demonstrated that Google is rather immune to conspiracy theories, having compared it to other search engines including Bing, Yandex, DuckDuckGo, and Yahoo. They found it has the highest proportion of scientific sources debunking the conspiracy theories available in its SERP. We also found that result counts for fact-checks were considerably higher than those of problematic content for all topics (with the exception of the war in Ukraine).



While we discovered that Google seems to actively diminish the visibility of problematic sources in organic results, we have not found evidence suggesting the competition is being won through an 'interrupted search' experience, which showcases fact-checks. The majority of the results we obtained was presented to users as normal organic results, and not indented or otherwise highlighted, e.g., as Google ClaimReview snippets. We also have observed that despite the perceived quality of fact-checks, they typically rank below the Golden Triangle of the top three results, suggesting that these SERP positions are typically reserved for other types of results (see Figure 2).

As said, previous work found that if one searches for problematic content, it is available. We would like to add that the searches, at least as we have determined, would require a certain specificity, and in many cases would still be in the neighborhood of fact-checks. It is important to note, however, that for queries (other than navigational ones or data voids), the presence of problematic content was notably less frequent.

As mentioned in the introduction, our work also serves as a proxy for considering the success of the efforts of fact-checking organisations as well as misinformation purveyors in garnering interest. Given their current web pages, fact-checkers could do even more to appear in the rankings, though the incentive may have been lowered if they are already optimised (so to speak) through content moderation.

## 6 CONCLUSIONS

Overall, our analysis reveals that fact-checks are outperforming problematic content. Across the five topic areas (Covid-19, climate change, war in Ukraine, U.S. liberals, and U.S. elections), Google Web Search on average tends to prioritise fact-checking articles by ranking them higher than the stories they aim to correct. Remarkably, that's despite their SEO optimisation levels being relatively similar to problematic content. They are also visibly more numerous in the SERP.

Content related to U.S. elections showed the largest ratio of fact-checks compared to non-fact-checks. It was also ranked much higher. The difference in visibility between fact-checks and problematic sources indicates content moderation on the part of Google. A similar pattern of visibility through moderation unfolded when prompting Google with climate change related queries. Climate-related fact-checks consistently held higher rankings, while contradictory claims lagged behind, despite their nearly identical SEO optimisation levels.

Corrective content targeting U.S. liberals, including prominent figures like President Joe Biden, also achieved higher average rankings than articles from sources of disputable quality. Unlike in the case of Covid-19, the difference in the quantity of organic search results between the two categories was modest.

While Google performs relatively well in terms of its apparent content moderation, improving the visibility of fact-checks, we also noted that some of the problematic content covering the presence of U.S. funded bio-labs in Ukraine could be accessed (high in the rankings and through indented results) using specific terms that may be termed 'navigational queries' such as 'Fox News Ukraine

bio-labs' or 'Carlson Ukraine secret bio-labs', which return various opinion pieces from Fox News on the subject.

Finally, there are limitations that we would like to mention as well as future research directions. Among the limitations concerns the stories we included in our analysis. They were initially identified by fact-checkers for Meta, which might influence both their perceived significance and relevance. Our sample of the ten stories in each thematic group could have been enriched with Meta's engagement data, although this idea was abandoned as it was thought to be a poor proxy for prominence in Google rankings, given the two platforms' different relevance metrics. Second, we are researching the competition between fact-checks and the content they are checking, but other source types (than fact-checks) could sow doubt about problematic content. Thirdly, the literature on the repurposing of professional SEO practices and tools is still emerging, and there are additional enhancements that could improve our research design. While we ensured that our keywords were popular and had broad topic coverage, we could add an additional step and run the query corpus through keyword research tools to validate it with search volume data, as proposed [57]. Finally, we analysed the outputs of queries with the parameter, US-en market, that is the U.S. Google region, where there may be greater moderation than in other languages and regions, as others have found [9] [51]

With respect to future research, we already identified particular query types (e.g., the navigational and data voids) as potential sources for greater prominence of problematic content compared to fact-checks. There is also the question of the extent to which these findings about content moderation may or may not hold across languages and regions. It is also a dynamic space so longitudinal work would be useful in future in order to re-assess the competition between fact-checks and the stories they target.

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## A APPENDIX

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**Table 3: List of SEO indicators based on Site Checkup metrics with descriptions of what it checks by authors.**

SEO Indicator	What it checks
Meta Title	Use of a concise page description
Meta Description	Use of a short and accurate summary of a page
Social media meta tags	If the webpage is using social media tags
Keyword Usage	If appropriate keywords are used in the webpage's title and description
Heading Tags	If the webpage is using any H1 and H2 HTML header tags
Robots TXT	If robots.txt file is present on the website
Sitemap	If the website has a sitemap
SEO URL Test	If the URL is properly formatted in terms of length and characters
Image Alt Text	If images on the website have alt attributes attached to them
Responsive Image	If images are properly formatted for users' viewports
Image Aspect Ratio	If images will display in the correct aspect ratio
Inline CSS Style	If the webpage is using HTML tags for inline CSS properties
Deprecated HTML Tags Test	If the webpage is using old, deprecated HTML tags
Google Analytics	If the webpage is connected with Google Analytics
Favicon	If the site is using and correctly implementing a favicon
Backlinks	Checks against potential low-quality backlinks
JS Error Test	Checks for JavaScript errors
Console Error Test	Checks Chrome DevTools Console for warnings and errors
Charset Declaration Test	If the webpage has a character encoding declaration ("charset")
Social Media Test	If the webpage is connected to one or more of the popular social networks
HTML Page Size	Checks the page's HTML size
DOM Size	Checks the size of the DOM tree
HTML Compression/GZIP	If the website is using HTML compression
Site Loading Speed	Checks website's loading speed
JS Execution Time	Checks the total execution time of the JavaScript code
Page Objects	If all the objects requested by the webpage can be retrieved
Page Cache (Server Side Caching)	If the webpage is serving cached pages
Flash	If the webpage uses flash
CDN Usage	If the webpage's resources (images, javascript and css files) are served via CDNs
Modern Image Format	If the webpage is serving images in modern formats (such as JPEG 2000, JPEG XR, and WebP)
Image Metadata	If the images used in a webpage have large metadata
Image Caching	If the page is using an image expires tag
JavaScript Caching	If the page is using caching headers for all JavaScript resources
CSS Caching	If the page is using caching headers for all CSS resources
JavaScript Minification	If any external javascript files used in the page are minified
CSS Minification	If any CSS files used in the page are minified
Render Blocking Resources	If any of the webpage's JavaScript or CSS resources are blocking the rendering
Nested Table	If the site contains nested tables
Frameset	If the page is using frames
Doctype	If the page has doctype declaration
URL Redirects	If the URL is a redirect-loop
Largest Contentful Paint	Checks if the Largest Contentful Paint (LCP) score of the analyzed webpage is 2.5 seconds or less
Cumulative Layout Shift	If the page has the Cumulative Layout Shift (CLS) score of 0.1 or less
URL Canonicalization	If potential URL canonicalization issues are present
SSL Checker and HTTPS	If the website is using HTTPS
Mixed Content (http over https)	If all resources are loaded over a secure HTTPS connection
HTTP Test	If the webpage and all resources are served over HTTP/2
HSTS Test	If the webpage is using the Strict-Transport-Security header
Safe Browsing	If the website is identified as having malware or exhibiting phishing activity
Server Signature	If the server signature is on
Directory Browsing	If the server allows directory browsing
Plain Text Emails	Checks the website for plain-text email addresses
Unsafe Cross-Origins	If all links to external pages that have the target="_blank" attribute also have the rel="noopener" or rel="noreferrer" attribute
Structured Data	If the webpage is using structured data markup
Custom 404 Error Page	If the website is using a custom 404 error page
Noindex Tag	If the webpage is using noindex tag to block showing in index pages
Canonical Tag	If the webpage is using the canonical link tag
Meta Refresh	If the webpage is using a refresh meta tag
SPF Records	If the DNS records contain an SPF record
Ads.txt Validation	If the website's ads.txt file has a valid format