Article

Googling Referendum Campaigns: Analyzing Online Search Patterns Regarding Swiss Direct-Democratic Votes

Sina Blassnig *, Eliza Mitova, Nico Pfiffner, and Michael V. Reiss

Department of Communication and Media Research, University of Zurich, Switzerland

* Corresponding author (s.blassnig@ikmz.uzh.ch)

Abstract
In direct democracies, voters are faced with considerable information demands. Although search engines are an important gateway to political information, it is still unclear what role they play in citizens' information behavior regarding referendum campaigns. Moreover, few studies have examined the search terms that citizens use when searching for political information and the potential "user-input biases" in this regard. Therefore, we investigate to what extent citizens search online for information about upcoming referendums and what differences emerge between proponents, opponents, and non-voters regarding the search terms they used and the results they visited, related to three national ballot proposals voted on in Switzerland on November 28, 2021. The study combines cross-sectional survey data with longitudinal digital trace data containing participants' Google Search histories obtained through data donations. Our findings show that participants rarely used Google to search for information about upcoming referendums. Moreover, most ballot-related searches employed rather neutral search terms. Nevertheless, a qualitative analysis of the search terms points to differences between different voting groups, particularly for the most prominent proposal around a Covid-19 law. The study provides interesting insight into how citizens search for information online during national referendum campaigns.

Issue
This article is part of the issue "Referendum Campaigns in the Digital Age" edited by Linards Udris (University of Zurich) and Mark Eisenegger (University of Zurich).

1. Introduction

In direct democracies, voters are faced with considerable information demands (Christin et al., 2002), especially in high-choice media environments (Van Aelst et al., 2017). On the one hand, citizens have more and more options to inform themselves about upcoming referendums. On the other hand, the use of opaque personalization algorithms by platforms such as Facebook or Google has sparked discussions about digital media's potential to foster selective exposure, create filter bubbles, and exacerbate political polarization (Nelson & Webster, 2017; Slechten et al., 2021). However, empirical studies have found little support for these assumptions (e.g., Fletcher & Nielsen, 2018; Möller, 2021; Nechushtai &

Lewis, 2019). Instead, recent research indicates that citizens' intentional individual news consumption choices or "user-input biases" (Trielli & Diakopoulos, 2022) may be more important factors than algorithmic filtering regarding how diverse or biased citizens' information exposure is. Until now, few studies have considered these user-input biases, and, to the best of our knowledge, no study has investigated online search patterns in relation to direct-democratic referendums. In this vein, it is of great interest to analyze the use of search engines during referendum campaigns and examine potential differences in online information-seeking behavior across political camps and between voters and non-voters. Such differences in search behavior could relate to gaps in political knowledge (Hopmann et al., 2016) and more

broadly to partisan polarization and exposure to misinformation (Peterson & Iyengar, 2021). To this end, examining the search terms that people use can prove especially fruitful because search queries often serve as an entry point that shapes subsequent information-seeking patterns and browsing sequences (Trielli & Diakopoulos, 2022; Urman et al., 2021).

Against this background, the questions arise as to what extent and how citizens use search engines to inform themselves about upcoming national referendum campaigns, what kind of search terms they use, and whether differences emerge between proponents and opponents of specific ballot proposals, as well as nonvoters regarding the search terms used and results visited.

Based on a combination of cross-sectional survey data and participants' Google Search histories collected through data donations, this study investigates these questions concerning the national vote in Switzerland on November 28, 2021, which included three ballot proposals: (a) a referendum on the federal law on the legal basis for ordinances of the Federal Council for the management of the Covid-19 epidemic (*Covid-19-Gesetz*, henceforth referred to as "Covid-19 referendum"), (b) a popular initiative for strong care (*Pflegeinitiative*, henceforth referred to as "care initiative"), and (c) a popular initiative for the determination of federal judges by lot (*Justiz-Initiative*, henceforth referred to as "justice initiative"). The Swiss political system distinguishes between referendums and initiatives: A referendum, like the Covid-19 referendum, allows voters to uphold or repeal laws approved by the legislature. Using popular initiatives, such as the care or justice initiatives, the electorate can demand an amendment to the federal constitution (Appendix A of the Supplementary Material contains additional context information). Switzerland is a particularly interesting case because the referendum and popular initiative are centerpieces of its political system (Trechsel & Kriesi, 1996). Swiss citizens are asked to vote on various national issue-specific proposals four times per year and therefore face an especially high demand for political information. We focus on Google Search because it is the most popular search engine in Switzerland, used by 96% of Swiss internet users in every age group (Latzer et al., 2020).

Our findings show that participants in our sample rarely used Google to conduct ballot-related searches, and if they did, they often employed rather neutral search terms. Nevertheless, a qualitative analysis of the search terms points to differences between different voting groups for the most prominent proposal, the Covid-19 referendum. Moreover, through its innovative method, this study demonstrates the importance of combining self-reported survey data and behavioral digital trace data, as we find differences between search terms that participants suggested in the survey and those actually employed, according to participants' donated Google Search histories. Yet, one of the challenges of this approach is the recruitment of participants (Breuer et al.,

2020). Due to a comparatively small sample of participants (*n* = 128) and data scarcity regarding ballot-related searches and visits, we refrain from formally testing the hypotheses proposed in the pre-registration. Instead, we explore the research questions exploratively and apply mainly descriptive and qualitative analyses.

2. The Role of Online Search Engines in Referendum Campaigns

To make rational political decisions, citizens need political knowledge. An informed electorate is therefore considered vital for a healthy democracy (Delli Carpini & Keeter, 1996), especially concerning referendums, in which citizens contribute to direct-democratic decisions on specific political issues. In deciding how to vote on specific ballot proposals, citizens draw on a variety of sources (Bonfadelli & Friemel, 2011). Although Swiss citizens attribute the highest relevance to offline contacts and traditional media regarding their political orientation (Reiss et al., 2021), they increasingly use online sources and search engines to obtain political information (fög, 2022).

In high-choice information environments, citizens combine different types of media use in their political information repertoires (e.g., Castro et al., 2022; Wolfsfeld et al., 2016) and increasingly access news in a "distributed" way through search engines, social media, and news aggregators (Fletcher et al., 2021; see also Bentley et al., 2019). Particularly, search engines have become one of the most important gateways to online news and political information (Bentley et al., 2019; Dutton et al., 2017; Möller et al., 2020; Newman et al., 2019) and can be considered a crucial factor in shaping political opinions (Epstein & Robertson, 2015). In a representative survey in Switzerland, 11% of respondents say their main gateway to online news is through search engines (fög, 2022). Moreover, Swiss citizens consider search engines more relevant than news aggregators or social media for forming political opinions (Reiss et al., 2021).

So far, the role of search engines, particularly Google, for political information purposes has mainly been investigated regarding election campaigns (e.g., Epstein & Robertson, 2015; Muddiman, 2013; Trevisan et al., 2018; Trielli & Diakopoulos, 2022; Unkel & Haim, 2021). In contrast to election campaigns in proportional systems—but similar to election campaigns in majoritarian electoral systems—referendum campaigns foster confrontation between two opposing camps. Referendum campaigns can further be distinguished from elections in that referendums focus on specific issues (Kriesi, 2011) and, therefore, can be viewed as a contest of topical arguments or issue frames (Hänggli, 2011). Whereas searches related to elections largely revolve around actors such as specific candidates (Trielli & Diakopoulos, 2022), the information-seeking behavior in referendum campaigns can be expected to be more issue-specific, with searches

reflecting different issue frames (van Hoof et al., 2022). However, referendum campaigns also bring a high level of insecurity and volatility because it is often unclear from the beginning which parties or elite actors stand on which side of the referendum (de Vreese, 2007). Thus, voters may combine issue-specific and actor-specific searches to consult their preferred party's position. Yet, few studies have examined the role of search engines for specific political issues, and most focus on the supply of information, for example, through content analyses of search results (e.g., Steiner et al., 2022). There is hardly any research on whether and how citizens search for information online during referendum campaigns. One notable exception is a qualitative study by Baxter and Marcella (2017) that explores how citizens searched for and used information during the Scottish referendum campaign on independence. However, because the study did not focus on search engines, it is still unclear to what extent and how citizens use them to get political information during referendum campaigns. This leads to our first two research questions:

RQ1: How often do Swiss voters actively search for information regarding upcoming referendums on Google?

RQ2: How often do Swiss voters click on search results regarding upcoming referendums on Google?

How often voters "google" for political information about referendums may be influenced by individual characteristics. Previous research has identified differences in the news consumption, political behavior, and political knowledge of Swiss citizens regarding age, gender, and education (e.g., Bonfadelli & Friemel, 2011; fög, 2022; Tawfik & Horber, 2010). Additionally, research on Swiss direct-democratic campaigns has shown that political interest motivates information-seeking and knowledge acquisition (Bonfadelli & Friemel, 2011). Similarly, the perceived importance of a political issue can drive more focused and elaborate information-seeking in direct-democratic votes (Goldberg et al., 2019). Furthermore, citizens' general information behavior may play a role, as Dutton et al. (2017) find that those who use search engines for political information are also likely to consult more media and sources. From this, we derive the following research question:

RQ3: What differences emerge related to individual characteristics (gender, age, education, political interest, issue importance, information behavior) regarding how often Swiss voters actively search for information regarding upcoming referendums on Google?

Given that search engine results are based on algorithms, depend on the search terms used, and are potentially personalized, further questions arise as to how citizens search for political information on upcoming referendums and whether there are differences in the search behavior and the clicked-on search results between different voter groups.

3. The Relationship Between Search Behavior and Attitudes Towards a Ballot

Scholarly discussion on algorithmically induced filter bubbles and echo chambers in online information environments has been flourishing (Möller, 2021). Despite widespread fears that algorithmic personalization reinforces preexisting beliefs by presenting users with information that matches their interests, empirical findings mostly indicate that the prevalence of filter bubbles is rather low (for an overview, see, e.g., Möller, 2021; Ross Arguedas et al., 2022). Likewise, auditing studies focusing on news aggregators such as Google News detect high degrees of homogeneity and concentration in users' search results despite differences in users' browser histories and political orientation (Haim et al., 2018; Nechushtai & Lewis, 2019). Thus, fears surrounding algorithmic personalization and its ability to fragment information exposure might be overstated.

These deflating fears of algorithmic filter bubbles draw attention toward users' intentional news consumption choices or "user-input biases" (Trielli & Diakopoulos, 2022, p. 3), which might be among the driving factors determining whether information exposure is diverse or not (Dubois & Blank, 2018). This perspective is strongly related to classical paradigms like selective exposure and cognitive dissonance theory (Bryant & Davies, 2015). Trielli and Diakopoulos (2022) argue that search queries can be interpreted as expressions of searchers' political preferences; they empirically find some differences in the search terms employed by voter groups with different ideological leanings during US elections. Similarly, van Hoof et al. (2022) show that political attitudes can impact search queries about political issues. Applied to referendum campaigns, one could expect proponents and opponents of a ballot proposal to use different search terms that express their respective attitudes toward the proposal. Thus, we formulate the following research question:

RQ4: What differences emerge between proponents, opponents, and non-voters regarding their employed search terms?

Differences in the use of search terms would not yet mean that proponents, opponents, and non-voters are exposed to different information sources. In fact, Trielli and Diakopoulos (2022, p. 157) find that Google results have a "mainstreaming effect": Despite differences in individual search terms, the search results include a highly similar set of media, practically neutralizing the differences in the search queries. However, the study does not analyze which results citizens click on. Based on selective exposure and cognitive dissonance theory

(Bryant & Davies, 2015), one could expect proponents and opponents of a ballot proposal to click on different search results depending on their political attitudes. Specifically, we could expect proponents to click more often on search results related to pro-proposition arguments than opponents and vice versa. This leads to the final research question:

> RQ5: What differences emerge between proponents, opponents, and non-voters regarding their visited search results?

4. Methods and Data

This study combines cross-sectional survey data with longitudinal digital trace data containing the Google Search histories of the survey participants. The digital trace data were collected through data donations from the survey participants, utilizing the right to data portability introduced by the General Data Protection Regulation (Ausloos & Veale, 2021). Compared to studies with similar research interests that relied on content analysis of keyword searches (Muddiman, 2013; Trielli & Diakopoulos, 2022; Unkel & Haim, 2021) or Google Trends data (Dutton et al., 2017; Trevisan et al., 2018), the combination of survey and digital trace data allows us to control for individual characteristics and to compare people's reported and actual search behavior. The study was preregistered (https://osf.io/xsp8z), although due to a lower response rate than expected, we focused on the research questions instead of the original hypotheses and had to adapt the analysis plan in large parts (deviations from the pre-registration are discussed in Appendix B of the Supplementary Material).

4.1. Research Design and Procedure

The survey consisted of three parts: First, participants provided information on their Google Search use and indicated whether they would be willing to donate their Google Search history for this research project. Participants who were unwilling to do so or did not have a Google account were dismissed from the study. Second, to donate their usage data, participants were redirected to an application set up by the researchers. In this application, participants were first instructed how to request and download their Google Search data from Google's takeout service (https://takeout.google.com/settings/takeout; for detailed instructions, see the questionnaire documentation in the pre-registration) and subsequently how to upload these data. During the upload, the data were automatically filtered to only contain entries recorded after 31 May 2021. After the upload, participants were shown an extract of the data they were about to donate. They then gave their final consent to donate their data to the research project. If they did not consent, the data were immediately deleted, and the participants were excluded from the remaining survey. Third, participants were again redirected to the survey to answer the remaining questions.

4.2. Operationalization

We used two approaches to measure ballot-related search terms: First, participants were asked in the survey to provide three to six search terms that they would use to search for information related to each proposal on Google (we call these survey search terms). Second, the search terms that they actually employed were extracted from the data donations (we call these donation search terms). Because the initial data donations contained all searches registered after 31 May 2021, the search terms had to be classified as being related to one of the three proposals or not. For this, a two-step approach was employed: First, a search term had to match both a list containing terms related to the issue of the respective ballot proposal *and* a list of terms related to the vote in general. These two lists were derived based on the survey search terms, the most-used terms on the websites of the pro and contra committees, and the official federal information. Second, the identified search terms were manually coded by the four researchers as either relevant or non-relevant for the respective ballot proposal ($K_\alpha = 0.94$). If less than three out of the four investigators agreed, the search term was classified as non-relevant.

The ballot-related visits were extracted from the data donations and identified as follows: First, a visit was classified as potentially ballot-related if it was registered after a ballot-related search term and before the next search activity in the Google Search history. One search query could trigger more than one visit. Second, the identified visits were manually coded as either ballot-related or non-ballot-related by the researchers, following the same logic as the search terms.

Next, we identified the stance and categories of search terms and visits. To identify their stance, the survey search terms, donation search terms, and ballot-related visits were classified by the authors as either pro, contra, or neutral ($K_\alpha = 0.86$). If less than three out of the four investigators agreed on a classification, the search term or visit was classified as neutral.

Additionally, we analyzed the search terms coded as neutral based on qualitative thematic coding (Braun & Clarke, 2012) following the example of Trielli and Diakopoulos (2022). First, initial codes were identified through open coding of the survey search terms for one voting proposal (care initiative). Second, through axial coding (Strauss & Corbin, 1998), discrete conceptual categories were derived and applied to the rest of the survey search terms. Finally, the categorization was refined and improved in discussion with all authors and applied to the donation search terms.

Voter groups were operationalized based on participants' self-report in the survey. For each voting proposal, participants indicated if they had voted "yes" or "no" or did not vote. Participants who voted "yes" were

classified as proponents, participants who voted "no" as opponents, and those who did not vote as non-voters for each proposal (for more context information, see Appendix A of the Supplementary Material).

Finally, participants' gender, age, education, political interest (1 = *not interested at all* to 7 = *highly interested*), political left–right orientation (1 = *left* to 7 = *right*), and perceived importance of the respective proposal (1 = *not important at all* to 5 = *very important*) were measured through self-reporting in the survey. Additionally, we asked about participants' information behavior, i.e., how often they came across information about the voting proposals on different types of channels (Google, YouTube, social media, newspapers/news sites, TV or radio, the official voting information booklet by the Swiss Federal Chancellery, and friends or family) on a scale from 1 (*never*) to 5 (*very often*). Based on these measures, we built a mean index indicating how often a participant, on average, came across information about the voting proposal on channels other than Google.

4.3. Participants and Sample

The study focused on German-speaking Swiss citizens who are eligible to vote (i.e., at least 18) and was conducted after the national vote on 28 November 2021. Ethical approval for the study was provided by the University of Zurich ethics committee (No. 21.10.1). Data collection took place from 29 November to 22 December 2021; 114 participants were recruited from the panel of a market research company, and 14 participants were recruited through an advertisement campaign on Facebook. Participation was rewarded with a fixed amount of Swiss francs for participants recruited by the market research company or by having a high chance of winning a voucher for participants recruited through Facebook.

The total sample consisted of 128 participants, 36.7% of whom were female (two participants did not indicate their gender), and the mean age was 47 (*SD* = 15.87, Min = 18, Max = 86). Regarding education, 5% reported compulsory school, 33% a vocational apprenticeship, 19% a high school diploma, and 42% a degree from a university or a university of applied sciences as their highest educational qualification attained. The mean political interest was 4.98 (*SD* = 1.59, Min = 1, Max = 7), and the mean political orientation was 3.7 (*SD* = 1.39, Min = 1 *left*, Max = 7 *right*). Due to the sampling procedure, this sample is not representative of the Swiss population. For comparison, Switzerland's permanent resident population (*N* = 8,670,300) has a mean age of 42.6 and is 50.4% female (Federal Statistical Office, 2022b). Regarding their highest educational qualification attained, 17% of the Swiss permanent resident population over 25 reported compulsory school, 33% a vocational apprenticeship, 9% a high school diploma, and 23% a university degree (Federal Statistical Office, 2022a). In a recent survey representative of the Swiss online population above 16, the average political interest was 3.33 (*SD* = 1.35) on a Likert scale from 1 to 5 (Reiss et al., 2021). Finally, according to representative data from the *Reuters Digital News Report*, the Swiss population positions itself practically in the center regarding political orientation (*M* = −0.02 on a scale from −0.5 = *fully left* to +0.5 = *fully right*; fög, 2022).

5. Findings

Overall, the final data contained 148,221 searches using 117,739 unique search terms and 103,386 visits to websites by 128 participants. Yet, regarding RQ1, the analysis shows that, across all proposals, respondents rarely searched for vote-related information on Google. In total, 90 ballot-related search queries were conducted across the three proposals. Of these, more than two-thirds (*n* = 65) were related to the Covid-19 referendum, 15 (16.7%) to the care initiative, and the remaining 10 (11.1%) concerned the justice initiative. In total, 78.9% of respondents (*n* = 101) never employed search terms related to the vote on November 28, while 21.1% of the respondents (*n* = 27) employed search terms related to the vote at least once. Of these 27 respondents, 21 searched for ballot-related information on Google between one and four times, and six used relevant search terms on five or more occasions. Search terms related to the Covid-19 referendum were employed most: 26 respondents searched at least once for the Covid-19 referendum, whereas only seven respondents did so for the care initiative and just five for the justice initiative. Notably, the number of searches is not evenly distributed across respondents, as five respondents account for half (51.1%) of all ballot-related searches that were conducted (see Tables A and B in Appendix C of the Supplementary Material).

Regarding RQ2, of the 90 relevant searches, 47 searches (52.2%) were followed by at least one visit. In total, 86 ballot-related visits were conducted after a related search query, with 14.8% of respondents (*n* = 19) proceeding to click on search results related to the votes. Of those, 14 clicked on related search results between one and four times. Five respondents clicked on search results more than five times. Compared to the results of RQ1, these percentages indicate that 70.3% (*n* = 19) of the 27 respondents who had previously conducted ballot-related search queries went on to visit a website, possibly to read more about the referendums; 75% (*n* = 48) of the relevant visits were conducted by three respondents. Notably, these three respondents also conducted the most searches within the sample.

Analogously to the findings for RQ1, respondents most often visited pages related to the Covid-19 referendum after conducting a related search query, followed by the care and justice initiatives. In total, 62.8% of visits (*n* = 54) pertained to the Covid-19 referendum, 25.6% (*n* = 22) to the care initiative, and the remaining 11.6% (*n* = 10) to the justice initiative. Of the 19 respondents who visited ballot-related websites, 16 visited a page

related to the Covid-19 referendum at least once, seven a page related to the care initiative, and five a page related to the justice initiative (see Tables A and C in Appendix C of the Supplementary Material).

Due to the low numbers of ballot-related search queries and subsequent visits related to the care initiative and the justice initiative, we focus on the Covid-19 referendum for the analysis of the remaining research questions.

To analyze RQ3, we perform logistic regression with a dummy variable indicating whether someone used at least one donation search term related to the Covid-19 referendum as a dependent variable; age, gender, education, political interest, perceived issue importance, and the mean index for information use were used as independent variables (see Table 1). Age has a significant negative effect, indicating that the younger the respondents, the more likely they were to conduct a ballot-related search. We find no significant effects for gender and education. General political interest has a significant positive effect. Thus, the more politically interested, the more likely someone was to google the referendum campaigns. In contrast, perceived issue importance has a significant negative effect, indicating that the higher the perceived importance of the Covid-19 referendum, the lower the likelihood that someone searched for it on Google. Finally, we find a significant positive effect for the use of other information channels, meaning that the more often participants came across information about the referendum on sources other than Google, the more likely they were to conduct ballot-related searches.

According to a descriptive analysis of participants' self-reported use of individual channels (see Table D in Appendix C of the Supplementary Material), participants relied to a relatively great extent on traditional media channels and on friends and family. Around half of the participants stated that they had used the official booklet (52.3%), online or offline newspapers (50.8%), and TV or radio (51.5%) often or very often to inform themselves about the referendums, whereas 27.3% said the same about Google, 23.4% about social media, and 9.4% about YouTube. More than two-thirds of participants (67.97%) discussed the referendum often or very often

with friends and family. Descriptively (see Figure A in Appendix C of the Supplementary Material), it seems that those who searched for the referendum (n = 26) tended to rely on Google, YouTube, social media, and friends and family more often for information related to the referendum than those who did not conduct any ballot-related searches (n = 102). However, when we calculate the same regression as in Table 1 for all information sources separately (instead of including one summary variable for the mean use of other information channels), we do not find significant effects for any of the information sources individually (see Table E in Appendix C of the Supplementary Material). Thus, while people who generally informed themselves more about the referendum also conducted more ballot-related searches, the use frequency of other individual sources did not significantly affect the number of ballot-related searches.

To explore RQ4, we look at the kind of survey and donation search terms entered by the Covid-19 referendum's opponents (n = 28), proponents (n = 86), and non-voters (n = 14). In total, the participants entered 418 survey search terms related to the Covid-19 referendum, and 65 donation search terms were identified as ballot-related. Through the process of qualitative thematic coding described above, 15 categories of search terms were identified (Table D in Appendix C of the Supplementary Material contains descriptions and examples for all categories). Figure 1 shows the distribution of categories for the survey search terms and the donation search terms and compares the use of categories between proponents and opponents of the Covid-19 law as well as non-voters (Table G in Appendix C of the Supplementary Material provides counts and percentages for all categories and groups).

In the survey search terms, the most common category across voter groups is general ballot-specific (36.4%), which contains general queries about a specific ballot proposal using neutral language related to the proposal's official wording. Queries that were explicitly pro (2.6%) or contra (2.1%) were rare, and a similar share of the survey search terms included both pro and contra arguments (2.2%). Thus, the search terms entered in the survey are

Table 1. Logistic regression predicting the likelihood of conducting a ballot-related search for the Covid-19 referendum according to the data donations.

	Ballot-related searches (Covid-19 referendum)				
	Estimate	*SE*	*OR*	*CI* 2.5%	*CI* 97.5%
(Intercept)	−0.75	2.35	0.47	0.00	42.83
Gender	−0.66	0.58	0.52	0.16	0.98
Age	−0.07**	0.02	0.93	0.89	0.97
Education	−0.28	0.25	0.76	0.45	1.24
Political interest	0.59*	0.26	1.80	1.12	3.16
Issue importance	−0.62*	0.25	0.54	0.33	0.87
Use of other information channels (mean index)	1.29*	0.56	3.62	1.29	11.74

Notes: N = 123, AIC = 99.81, Nagelkerke R^2 = 0.38; SE = standard error, OR = odds ratio, CI = confidence interval; * p < 0.05, ** p < 0.01.
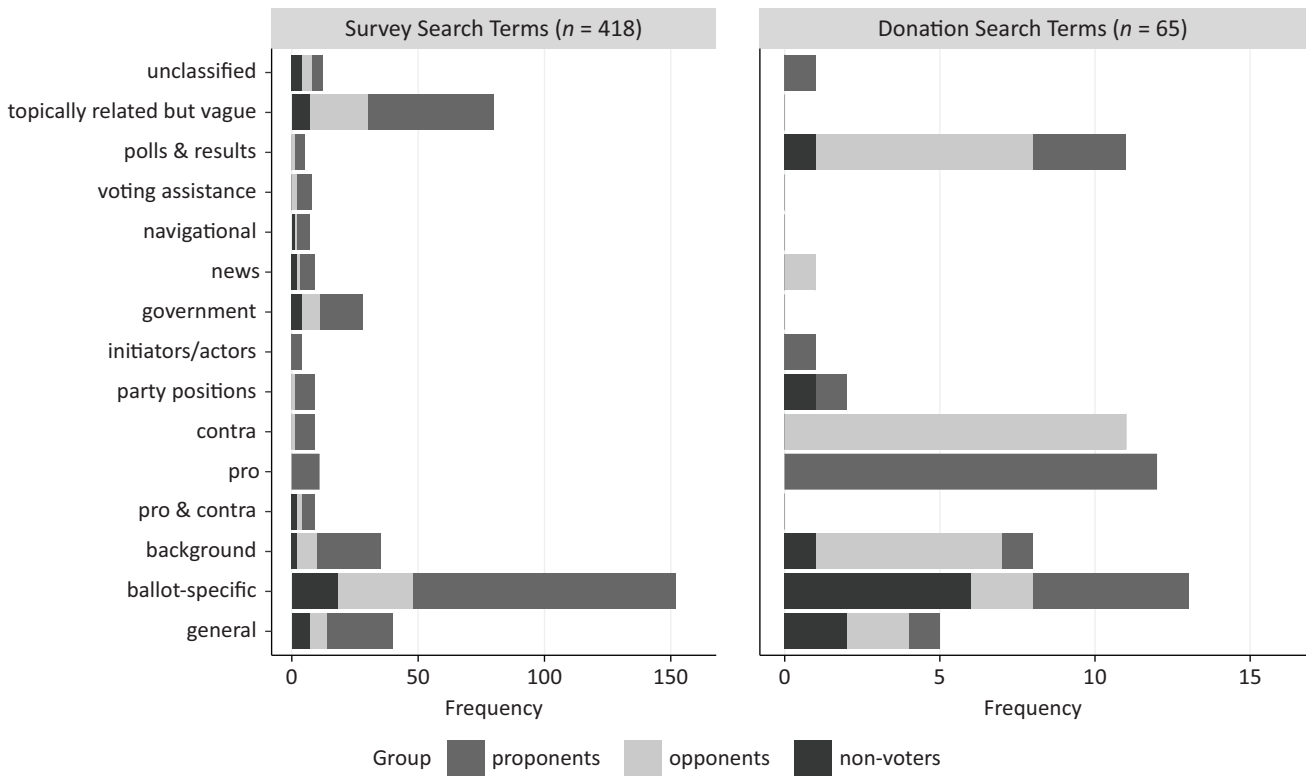
Figure 1. Distribution of categories of search terms per group for the Covid-19 referendum.

largely neutral. Yet, a variety of more specific categories also emerged, such as queries about background information on the referendum (8.4%), queries including references to the government (6.7%), queries about party positions (2.2%), or queries tailored to reach specific voting assistance websites (1.7%). However, there are no clear patterns that suggest differences between proponents, opponents, and non-voters.

Regarding the donation search terms, for proponents of the Covid-19 law, the three most common categories are pro (48%), general ballot-specific (20%), and polls and results (12%). Thus, almost half of the proponents' donation search terms are in the pro category, asking explicitly about the advantages of or arguments in favor of the law. For opponents, in contrast, the most common category is contra, with 37.9% of their donation search terms asking explicitly about the disadvantages of or arguments against the law, followed by polls and results (24.1%) and background (20.7%). The donation search terms entered by non-voters mainly fall into the categories general ballot-specific (54.5%) or general (18.2%), which both refer to more neutral and generalized search terms. Thus, Figure 1 reveals differences between the survey search terms and the donation search terms. The donation search terms fall into fewer categories than the survey search terms and reveal more interesting differences between the voter groups. Furthermore, in contrast to the survey search terms, none of the proponents' or opponents' donation search terms could be assigned to the opposing camp or included both pro and contra arguments.

Finally, to answer RQ5, we tabulate the counts of all ballot-related visits ($n = 54$) coded as pro, contra, or neutral for the Covid-19 referendum's proponents, opponents, and non-voters (see Table 2). Across all voter groups, most ballot-related visits for the Covid-19 referendum were classified as neutral. A qualitative analysis showed that these neutral visits contained a range of websites run mainly by the government—for example, the official government information page on the votes from November 28, 2021 (Federal Department of Home Affairs, 2021), or news media such as the Swiss public broadcaster (https://www.srf.ch) or *Neue Zürcher Zeitung* (https://www.nzz.ch). The few vote-related visits by non-voters were exclusively classified as neutral. In contrast, 37.5% of visits by proponents were identified as pro, and 30.3% of the visits by opponents were identified as contra. Thus, websites explicitly advocating in favor of the law were visited exclusively by participants who indicated in the survey that they had voted in favor of the law and vice versa. Based on qualitative inspection of the links, these visits coded as either pro or contra included visits to websites of the pro and contra committees (e.g., https://covidgesetz-nein.ch or https://ja-aus-vernunft.ch) as well as parties or organizations explicitly in favor of or against the proposal.

6. Discussion and Conclusion

Overall, our findings indicate that respondents rarely used Google to search for information about upcoming referendums. This low frequency of searches related to

Table 2. Distribution of pro, contra, and neutral visits related to the Covid-19 referendum per voter group.

| | Visits related to the Covid-19 referendum | | | | | |
| | Proponents | | Opponents | | Non-voters | |
	n	%	*n*	%	*n*	%
Pro	6	37.5	0	0.0	0	0.0
Contra	0	0.0	10	30.3	0	0.0
Neutral	10	62.5	23	69.7	5	100.0
Total	16	100.0	33	100.0	5	100.0

Notes: The descriptive statistics are based on *n* = 129 participants (86 proponents, 28 opponents, and 14 non-voters); *n* = 54 ballot-related visits.

the direct-democratic votes is remarkable, given the high complexity and relevance of such political decisions. One explanation could be that participants relied more on traditional news sources than online search engines for information about the upcoming vote. This interpretation is in line with previous findings on the perceived relevance of algorithmic selection applications for political information-seeking (Reiss et al., 2021) and supported by our survey data on participants' media use. Around half of the participants used traditional mass media or the official voting information booklet by the Swiss Federal Chancellery often or very often for vote-related information, whereas less than a third said the same about Google. Yet, the positive relation between average information use and ballot-related searches could indicate that search engines are a complementary form of information gathering rather than a substitute for more traditional information sources. However, due to the small non-representative sample, this interpretation is somewhat speculative.

We further find that the younger and more politically interested are more likely to search for ballot-related information. Whereas the effect for political interest is in line with previous research (Bonfadelli & Friemel, 2011), the finding regarding age may be because younger citizens generally use online sources more often for their political information (fög, 2022). Furthermore, we find that higher perceived issue importance of the referendum had a negative effect on whether someone performed a ballot-related search. This could be because these voters had already formed an opinion early on or relied on other information sources.

Although, according to the data donations, the respondents seldomly searched for vote-related information, for those that did, our qualitative analysis, on the one hand, points to noteworthy differences between the search terms that participants suggested in the survey and those that were actually employed in the data donations: The donation search terms were proportionally more often identified as explicitly pro or contra and were worded more generally than the survey search terms. On the other hand, both the survey and donation search terms were overall rather neutral and often closely related to the official description of the proposals, for example, in the form of general ballot-specific

search terms. Additionally, most search terms were issue-specific and rarely included references to specific parties or other actors.

Furthermore, the qualitative analysis indicates differences between voting groups in their actual searching behavior. For the Covid-19 referendum, which was the most prominent and controversial of the three proposals in the Swiss news coverage (Udris, 2021), proponents more often used search terms related to pro-proposition arguments than opponents, and vice versa. In contrast, non-voters conducted fewer searches and employed more neutral search terms. Similarly, most ballot-related visits were neutral and often included government or news websites. Yet, websites explicitly in favor of the proposal were exclusively visited by proponents, and opponents of the proposal only visited websites explicitly against the proposal. Thus, the findings tentatively indicate potential user-input biases in searches and visits around referendum campaigns that should be further explored in future research.

Our study has several limitations. First, due to the relatively small sample and the data scarcity regarding ballot-related searches, our analyses remain largely descriptive and qualitative. Therefore, our findings should be interpreted with caution and cannot be generalized. Since we conducted our study, scholarly discussions about best practices of data donations and how to increase participation rates have intensified, and future studies should incorporate these novel insights into their design to obtain larger samples (Ohme & Araujo, 2022; van Driel et al., 2022). Second, the sample is not representative of the Swiss voting population and asking participants for data donations may introduce some self-selection bias. Compared to data from official population statistics and representative surveys, our respondents are disproportionately male, slightly older (partly due to our focus on voters above 18), more highly educated, and more politically interested. Given our finding that political interest positively correlates with ballot-related searches, we may, therefore, still overestimate how often Swiss citizens search for political information on Google. In contrast, this bias could be offset by the sample's slightly higher mean age, as age correlated negatively with ballot-related searches. Third, we cannot make any statements about the intentions behind the employed

search terms. For example, although the results suggest that the use of pro or contra search terms may reflect attitudes toward a ballot, it could be that people intentionally search for arguments or parties that oppose their attitude. Fourth, although googling during the campaign temporally precedes voting, we compared search patterns across groups defined by vote choice. Thus, there could be reverse causality in that the searches and websites visited influenced participants' vote choice and not vice versa. To better assess the causality between search behavior and vote choice, future research could rely on panel designs, asking about voting intentions and suggested search terms in a first wave in an early campaign stage, and obtaining participants' Google Search histories and final vote choice in a second wave after the vote. Finally, although the period of analysis included three voting proposals on very different issues, we examined only one voting date in one country, and our analysis focused mainly on the Covid-19 referendum. The fact that citizens most often searched for the Covid-19 referendum may indicate that the frequency of searches is higher for more contested issues. Accordingly, the frequency of searches may be higher in countries where referendums are rare and, therefore, often associated with higher stakes. In turn, this argument is contradicted by the finding that the perceived importance was negatively related to the likelihood that participants conducted ballot-related searches. Thus, as we can only speculate about such generalizations, future research should investigate whether the frequency of Google searches is higher for different issues or in other countries where referendums are less routine than in Switzerland.

Nevertheless, this study provides interesting insights into how Swiss citizens search for information online in national referendum campaigns. First, it indicates that search engines may only play a limited role in Swiss referendum campaigns. Second, it shows that when citizens search for ballot-related information, the search terms employed are largely neutral but may reflect certain user-input biases. Finally, through the comparatively novel approach of using survey respondents' data donations, the study points to the importance of combining self-reported survey data and behavioral digital trace data, as we find differences between the search terms suggested in the survey and the actually employed search terms according to participants' Google Search histories. Thus, this study shows that surveys are insufficient for investigating search behavior. Although searches about referendum campaigns are rare, they may be demonstrative of the searchers' intentions, reinforcing previous literature on search terms as indicators of personal attitudes.

Acknowledgments

Conflict of Interests

The authors declare no conflict of interests.

Supplementary Material

Supplementary material for this article is available online: https://osf.io/9bhq3

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About the Authors

Sina Blassnig is a senior research and teaching associate at the Department of Communication and Media Research (IKMZ) at the University of Zurich. Her main research areas include online political communication, digital journalism, and the changing role of citizens in digital information environments. She wrote her dissertation on populist online communication and is working on projects on algorithmic news recommender systems, online information behavior, and hate speech.

Eliza Mitova is a research assistant, lecturer, and doctoral student at the Department of Communication and Media Research (IKMZ) at the University of Zurich. Her research focuses on the use, perception, and impact of algorithmic solutions on journalism, political information environments, and democratic society.

Nico Pfiffner is a research assistant and PhD candidate at the Department of Communication and Media Research (IKMZ) at the University of Zurich. His current work focuses on the question of how digital trace data can be made accessible for academic research through data donations from citizens. He is interested in both the technical implementation of data donation collections as well as the associated practical and epistemological challenges and implications.

Michael V. Reiss is a research assistant and PhD candidate at the Department of Communication and Media Research (IKMZ) at the University of Zurich. In his research, he applies and combines traditional quantitative and computational methods to advance our understanding of news consumption, news avoidance, and political orientation in the online sphere.