

## Appendix A: Tables and Figures

Table A1

*Description and examples of search query indicators*

Indicator	Description	Examples
<b>Format</b>		
Effective/ ineffective	Effective search queries will return search results related to immigration or climate change, whereas ineffective search queries will not generate related search results but can be interpreted as such (e.g., not adding “immigration” or “climate” to the query).	<i>foreigners criminals; climate research</i> (effective). <i>criminals; causes</i> (ineffective).
Question	Search queries that are formulated as a question.	<i>how many immigrants come to the netherlands?; how to live sustainable?</i>
English	Search queries in English instead of Dutch.	
<b>Specific/generic</b>	Specific search queries aimed at finding information on a specific subtopic related to immigration or climate change, whereas generic search queries are aimed at finding general information and do not address any subtopics.	<i>crime asylum seekers; nitrogen and climate</i> (specific). <i>immigration; climate</i> (generic)
<b>Immigration topics</b>		
Debate	Search queries that explicitly refer to a debate about immigration.	<i>discussion about immigration; stances immigration debate</i>
Problems	Search queries that explicitly refer to problems surrounding immigration.	<i>migration problems; refugee problems</i>
Admission	Search queries about the admission or rejection of immigrants to a new country or its related institutions and procedures.	<i>asylum procedure; residence permit</i>
Accommodation center	Search queries about accommodation centers (Dutch: “asylum seekers centers”).	<i>accommodation center netherlands; accommodation center locations</i>
Housing	Search queries about the housing market.	<i>available housing asylum seekers; housing shortage immigrants</i>
Integration	Search queries about integration.	<i>integration course; integration problems</i>
Crime	Search queries about crime or “nuisance.”	<i>crime immigrants; immigration and safety</i>

Table A1 – Continued from previous page

<b>Indicator</b>	<b>Description</b>	<b>Examples</b>
Racism	Search queries about racism or related organisations.	<i>discrimination foreigners; racism in the netherlands</i>
Economy (Financial) support	Search queries about the labour market or education. Search queries about social benefits and finances.	<i>migrants percentage job; unemployment foreigners benefits immigrants; financing refugees</i>
Culture and religion	Search queries about culture and religion.	<i>cultural differences; islam habits</i>
Causes	Search queries about the causes of immigration.	<i>causes immigration; climate immigration</i>
Politics	Search queries about political stances, political parties, politicians or other political entities.	<i>political stances immigration; immigration FVD</i>
Statistics	Search queries about the size of (incoming) immigrant groups, trends or other statistics.	<i>number of refugees 2020; how many foreigners live here?</i>
Origin	Search queries about where immigrants come from.	<i>which countries many immigrants; origin asylum seekers</i>
News	Queries that aim to find news.	<i>immigration news; immigration nu.nl</i>
<b>Climate change topics</b>		
Politics and policy	Search queries about politics or policy.	<i>environmental policy; climate goals politics</i>
Debate	Search queries about a debate surrounding climate change.	<i>climate discussions; thoughts about climate change</i>
Causes	Search queries about potential causes of climate change.	<i>most important factors climate change; causes climate change</i>
Consequences	Search queries about the consequences of climate change.	<i>ice caps melting; consequence climate change</i>
Solutions (general)	Search queries aimed at finding potential solutions for climate change.	<i>how do we prevent climate change; better care for climate</i>
Individual behaviour	Search queries about taking individual action against climate change.	<i>what can I do?; eating less meat</i>
Trends and current status	Search queries about the trend or current status of climate change, and queries about the research, statistics or trends.	<i>climate 2020; news climate change</i>

Table A1 – Continued from previous page

<b>Indicator</b>	<b>Description</b>	<b>Examples</b>
Industry	Search queries about all industry, other than energy and agriculture.	<i>buying clothes; industry emission statistics</i>
Agriculture	Search queries about the agriculture industry, including cultivating plants and livestock.	<i>farmers; meat consumption</i>
Transport	Search queries about (road, rail, air and marine) transportation.	<i>pollution diesel cars; air travel and climate</i>
Energy	Search queries about the energy industry.	<i>renewable energy; nuclear energy</i>
Nitrogen	Search queries about nitrogen emissions.	<i>nitrogen policy; nitrogen emissions in NL</i>
Carbon	Search queries about carbon emissions.	<i>carbon footprint; carbon neutral house</i>
Climate change denial	Search queries that exhibit climate change denial.	<i>climate hysteria; truth about climate change</i>
Climate change deniers	Search queries about climate change deniers.	<i>climate change denial; climate deniers</i>
Activism	Search queries about climate change activism.	<i>environment activists; action groups</i>
Environmental problems	Search queries about general or other environmental problems (e.g., water pollution, deforestation, loss of biodiversity).	<i>recycling; environmental protection</i>

*Note.* All examples are translations from Dutch. All indicators are coded 1 (present) or 0 (absent), with the exception of effective (1)/ineffective (0), specific (1)/generic (0), and English (1)/Dutch (0).

Table A2

*Inter-coder reliability results of 10% sample*

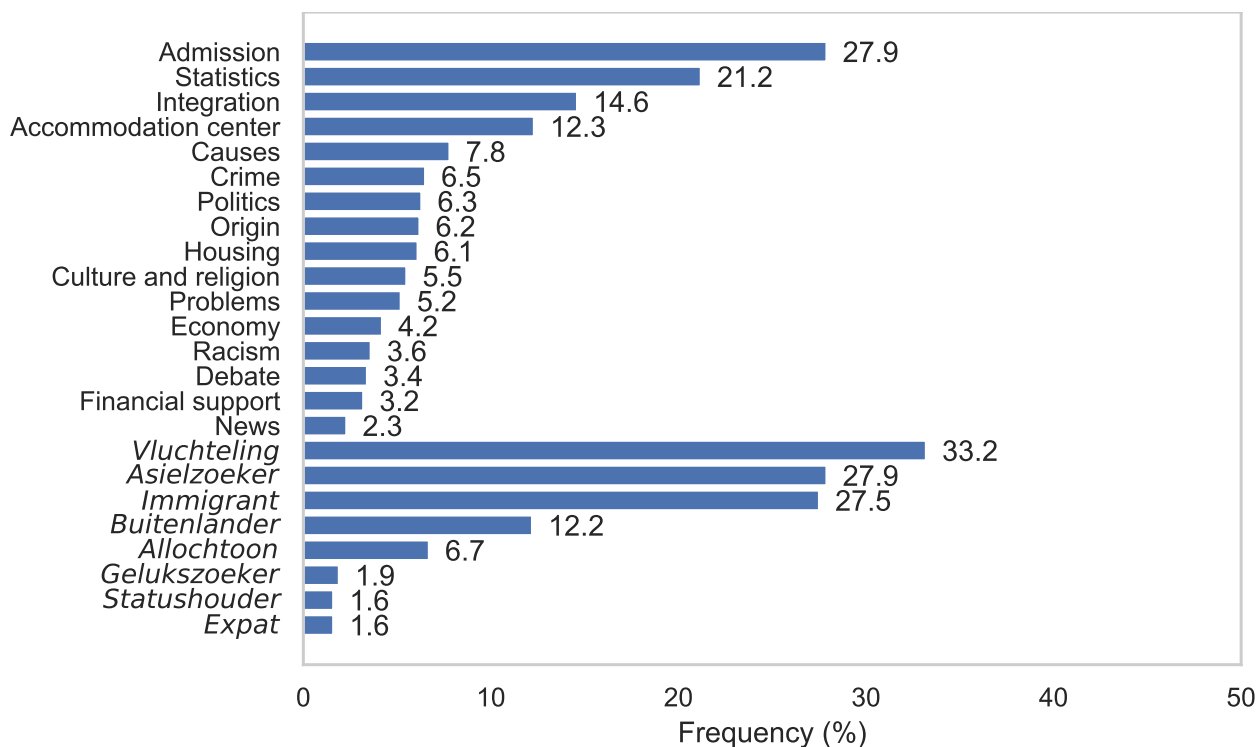
<b>Immigration (<math>n = 273</math>)</b>		<b>Climate change (<math>n = 267</math>)</b>	
<b>Indicator</b>	<b>Krippendorff Alpha</b>	<b>Indicator</b>	<b>Krippendorff Alpha</b>
Valid	0.732	Valid	0.772
Specific (vs. general)	0.749	Specific (vs. general)	0.829
Effective	0.726	Effective	0.814
Question	0.921	Question	0.794
English	0.950	English	0.931
Debate	0.793	Politics and policy	0.877
Problems	0.734	Debate <sup>c</sup>	0.665
Admission	0.841	Causes	0.742
Housing <sup>a</sup>	0.835	Consequences	0.867
Integration	0.790	Solutions	0.853
Crime	0.828	Individual behaviour	0.784
Racism	1.000	Trends and current status	0.755
Economy <sup>b</sup>	0.479	Industry <sup>c</sup>	0.855
Culture and religion	1.000	Agriculture <sup>c</sup>	1.000
Causes	0.807	Transport	0.945
Politics	0.884	Energy	0.969
Statistics <sup>a</sup>	0.820	Nitrogen	1.000
News	1.000	Carbon	1.000
		Climate change denial	0.742
		Climate change deniers <sup>c</sup>	1.000
		Environmental problems	0.920
		Activism <sup>c</sup>	0.855

<sup>a</sup> After calculation of the inter-coder reliability, we decided to split Housing and Accommodation center, and Statistics and Origin.

<sup>b</sup> The lower inter-coder reliability in Economy is almost completely explained by disagreement over search queries referring to social benefits and its financing. Consequently, we decided to solve this by creating an additional category: (Financial) support.

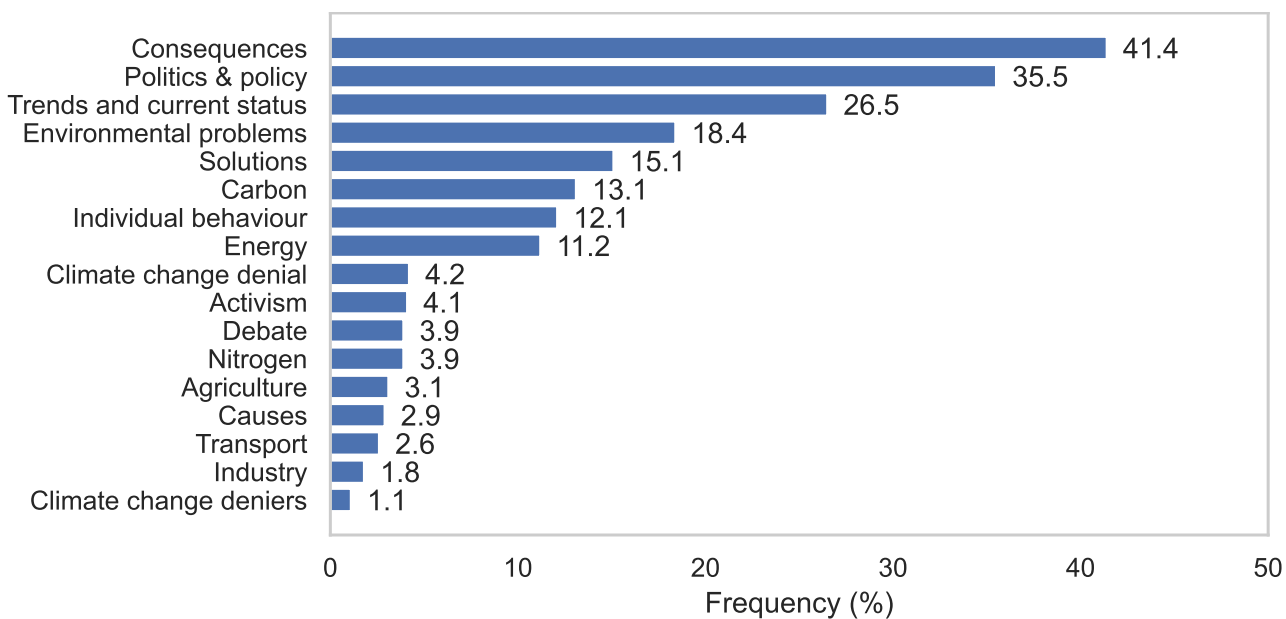
<sup>c</sup> The frequency of search queries in the sample for these indicators is rare ( $n < 5$ ), which means the alpha is less reliable.

Figure A1. Frequency of immigration search query indicators ( $n = 1,607$ )



Note. The frequencies do not add up to 100% because multiple indicators can apply to the same search query and scores are based on three search queries per respondent. Terms in italics.

Figure A2. Frequency of climate change search query indicators ( $n = 1,729$ )



Note. The frequencies do not add up to 100% because multiple indicators can apply to the same search query and scores are based on three search queries per respondent.

Table A3

*Comparison of fit indices across LCA solutions for immigration queries*

Classes	LL	df	BIC	AIC	aBIC	LMR-LRT <i>p</i> -value
2	-11055.47	1558.00	22472.66	22208.94	22317.00	
3	-10966.27	1533.00	22478.81	22080.53	22243.72	0.000
4	-10883.48	1508.00	22497.79	21964.96	22183.29	0.000
5	-10826.86	1483.00	22569.10	21901.72	22175.18	0.000
6	-10788.06	1458.00	22676.06	21874.12	22202.72	0.000
7	-10754.85	1433.00	22794.19	21857.70	22241.43	0.000
8	-10719.93	1408.00	22908.89	21837.85	22276.71	0.000

Table A4

*Class-conditional item probabilities across LCA classes for immigration queries (n = 1,607)*

Indicator	<i>Searcher types</i>				
	Asylum	Statistics & Facts	Cultural Impact	Refugees	Economic Impact
<b>Terms</b>					
Immigrant	0.13 (0.03)	0.47 (0.05)	0.22 (0.04)	0.12 (0.03)	0.44 (0.04)
Buitenlander	0.04 (0.02)	0.00 (0.00)	0.29 (0.04)	0.02 (0.02)	0.24 (0.04)
Gelukszoeker	0.03 (0.01)	0.01 (0.01)	0.01 (0.01)	0.04 (0.01)	0.01 (0.01)
Statushouder	0.02 (0.01)	0.02 (0.01)	0.00 (0.01)	0.03 (0.01)	0.01 (0.01)
Allochtoon	0.07 (0.02)	0.04 (0.02)	0.20 (0.04)	0.02 (0.01)	0.01 (0.02)
Vluchteling	0.00 (0.00)	0.23 (0.04)	0.16 (0.05)	1.00 (0.00)	0.21 (0.05)
Expat	0.01 (0.01)	0.00 (0.00)	0.00 (0.01)	0.00 (0.01)	0.05 (0.02)
Asielzoeker	0.61 (0.05)	0.19 (0.04)	0.04 (0.03)	0.28 (0.03)	0.26 (0.04)
<b>Topics</b>					
Admission	0.41 (0.04)	0.39 (0.05)	0.12 (0.03)	0.24 (0.03)	0.25 (0.04)
Accommodation center	0.35 (0.05)	0.05 (0.02)	0.02 (0.02)	0.19 (0.03)	0.00 (0.00)
Causes	0.03 (0.01)	0.16 (0.03)	0.07 (0.02)	0.13 (0.02)	0.01 (0.01)
Crime	0.13 (0.03)	0.09 (0.03)	0.08 (0.02)	0.01 (0.01)	0.02 (0.01)
Culture and religion	0.02 (0.02)	0.03 (0.02)	0.24 (0.04)	0.00 (0.01)	0.00 (0.00)
Debate	0.00 (0.00)	0.01 (0.01)	0.03 (0.02)	0.01 (0.01)	0.11 (0.02)
Economy	0.00 (0.00)	0.04 (0.02)	0.04 (0.02)	0.01 (0.01)	0.11 (0.03)
(Financial) support	0.02 (0.01)	0.03 (0.02)	0.00 (0.00)	0.04 (0.01)	0.06 (0.02)
Housing	0.07 (0.02)	0.03 (0.02)	0.00 (0.00)	0.03 (0.01)	0.16 (0.03)
Integration	0.23 (0.03)	0.05 (0.02)	0.22 (0.04)	0.11 (0.02)	0.12 (0.03)
News	0.03 (0.01)	0.00 (0.00)	0.00 (0.00)	0.01 (0.01)	0.07 (0.02)
Origin	0.02 (0.02)	0.30 (0.05)	0.03 (0.01)	0.00 (0.00)	0.00 (0.00)
Politics	0.01 (0.02)	0.07 (0.02)	0.08 (0.02)	0.04 (0.01)	0.11 (0.03)
Problems	0.03 (0.01)	0.05 (0.02)	0.06 (0.02)	0.07 (0.02)	0.05 (0.02)
Racism	0.03 (0.01)	0.00 (0.00)	0.15 (0.03)	0.01 (0.01)	0.00 (0.00)
Statistics	0.13 (0.03)	0.59 (0.06)	0.16 (0.03)	0.08 (0.02)	0.16 (0.03)
<b>Estimated class share</b>	0.195	0.176	0.188	0.211	0.230

*Note.* Class-conditional item probabilities presented. Standard errors in parentheses.

Table A5

*M2: Results of binary logistic regressions predicting immigration searcher type (n = 1,483)*

	Asylum	Statistics & Facts	Cultural Impact	Refugees	Economic Impact
Immigration attitudes	0.805 (0.116)	1.405 (0.245)	0.988 (0.141)	0.967 (0.127)	1.005 (0.137)
Issue importance	1.198 (0.228)	0.743 (0.148)	0.999 (0.186)	1.141 (0.186)	0.919 (0.161)
Immigrant attitudes*	0.984 (0.038)	1.079 (0.051)	1.002 (0.040)	0.956 (0.035)	1.003 (0.038)
Political interest	0.994 (0.030)	1.031 (0.035)	0.930* (0.028)	1.037 (0.029)	1.007 (0.030)
Education (ref. = low)					
Medium	1.358 (0.376)	4.130* (2.474)	0.624 (0.157)	1.165 (0.306)	0.648 (0.165)
High	1.171 (0.335)	6.442** (3.861)	0.604 (0.158)	0.906 (0.245)	0.710 (0.186)
Age	1.009 (0.005)	0.989* (0.005)	1.002 (0.005)	1.008 (0.004)	0.990* (0.004)
Male (ref. = female)	1.193 (0.165)	0.931 (0.145)	1.639*** (0.238)	0.676** (0.088)	0.885 (0.122)
Constant	0.214* (0.137)	0.013*** (0.013)	0.371 (0.240)	0.287* (0.178)	0.735 (0.462)
<b>Log-likelihood</b>	-724.08	-622.60	-696.7	-815.87	-746.98
<b>Nagelkerke Pseudo R2</b>	0.0324	0.0473	0.025	0.0255	0.0111

*Note.* Estimates presented as OR. Standard errors in parentheses.\* $p < .1$ ; \*\* $p < .05$ ; \*\*\* $p < .01$



Table A6

*Comparison of fit indices across LCA solutions for climate change queries*

<b>Classes</b>	<b>LL</b>	<b>BIC</b>	<b>AIC</b>	<b>aBIC</b>	<b>LMR-LRT <i>p</i>-value</b>
2	-8667.98	17596.90	17405.97	17485.71	
3	-8517.16	17429.45	17140.32	17261.08	0.000
4	-8402.45	17334.23	16946.91	17108.67	0.000
5	-8326.33	17316.19	16830.66	17033.44	0.000
6	-8263.94	17325.60	16741.88	16985.67	0.000
7	-8228.20	17388.32	16706.41	16991.21	0.000
8	-8195.28	17456.68	16676.57	17002.38	0.000
9	-8175.27	17550.84	16672.54	17039.36	0.004
10	-8159.46	17653.42	16676.92	17084.75	0.035

Table A7

*Class-conditional item probabilities across LCA classes for climate queries (n = 1,729)*

<b>Indicator</b>	<b>Searcher types</b>			
	<b>Solutions</b>	<b>Politics &amp; Information</b>	<b>Consequences</b>	<b>Actors &amp; Factors</b>
Politics and policy	0.28 (0.04)	0.61 (0.03)	0.19 (0.02)	0.26 (0.03)
Debate	0.00 (0.00)	0.10 (0.01)	0.02 (0.01)	0.00 (0.00)
Causes	0.08 (0.02)	0.04 (0.01)	0.02 (0.01)	0.00 (0.00)
Consequences	0.19 (0.04)	0.00 (0.00)	1.00 (0.00)	0.24 (0.04)
Solutions	1.00 (0.00)	0.04 (0.02)	0.05 (0.01)	0.00 (0.00)
Individual behaviour	0.51 (0.05)	0.00 (0.01)	0.00 (0.00)	0.29 (0.03)
Trends and current status	0.22 (0.03)	0.41 (0.03)	0.24 (0.02)	0.10 (0.02)
Industry	0.02 (0.01)	0.01 (0.01)	0.01 (0.00)	0.05 (0.01)
Agriculture	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)	0.12 (0.02)
Transport	0.01 (0.01)	0.00 (0.00)	0.00 (0.00)	0.12 (0.02)
Energy	0.11 (0.02)	0.01 (0.01)	0.03 (0.01)	0.43 (0.04)
Nitrogen	0.01 (0.01)	0.03 (0.01)	0.02 (0.01)	0.10 (0.02)
Carbon	0.09 (0.02)	0.07 (0.01)	0.13 (0.01)	0.26 (0.03)
Climate change denial	0.02 (0.01)	0.06 (0.01)	0.01 (0.01)	0.07 (0.02)
Climate change deniers	0.01 (0.01)	0.02 (0.01)	0.01 (0.01)	0.00 (0.00)
Activism	0.02 (0.01)	0.05 (0.01)	0.04 (0.01)	0.04 (0.01)
Environmental problems	0.19 (0.03)	0.11 (0.02)	0.18 (0.02)	0.32 (0.04)
<b>Estimated class share</b>	0.121	0.335	0.343	0.202

*Note.* Class-conditional item probabilities presented. Standard errors in parentheses.

Table A8

*M3: Results of binary logistic regressions predicting climate searcher type (n = 1,595)*

	<b>Solutions</b>	<b>Politics &amp; Information</b>	<b>Consequences</b>	<b>Factors &amp; Actors</b>
Climate attitudes	1.088 (0.084)	0.992 (0.053)	1.031 (0.053)	0.909 (0.058)
Issue importance	0.995 (0.114)	0.913 (0.071)	1.070 (0.082)	1.039 (0.099)
Political orientation	1.043 (0.039)	0.978 (0.025)	1.015 (0.025)	0.981 (0.031)
Political interest	0.993 (0.034)	0.991 (0.024)	0.985 (0.023)	1.044 (0.031)
Education (ref. = low)				
Medium	1.103 (0.395)	0.815 (0.180)	1.300 (0.286)	0.855 (0.225)
High	1.226 (0.449)	0.834 (0.191)	1.144 (0.261)	0.947 (0.258)
Age	0.988* (0.005)	0.983*** (0.004)	1.015*** (0.004)	1.013** (0.005)
Male (ref. = female)	0.472*** (0.082)	1.118 (0.130)	1.150 (0.129)	1.161 (0.165)
Constant	0.162** (0.097)	2.068 (0.821)	0.157*** (0.062)	0.143*** (0.070)
<b>Log-likelihood</b>	-574.91	-992.8	-1043.2	-732.88
<b>Nagelkerke Pseudo R2</b>	0.0458	0.022	0.0219	0.0199

*Note.* Estimates presented as OR. Standard errors in parentheses.\* $p < .1$ ; \*\* $p < .05$ ; \*\*\* $p < .01$

## Appendix B: Search queries using survey data

This appendix describes the search queries in our survey data. It helps to understand how this option compares to alternatives of collecting search queries, such as real-life search data.

Far out the most respondents entered three valid search queries for both immigration (80.6%) and climate change (86.7%). Invalid entries were mostly by respondents who did not want to answer this question, which is a common problem in open-ended survey questions (Reja et al., 2003). These respondents were often lower-educated.

In fact, nearly all respondents in our sample entered ‘effective’ search queries that seem to resemble real search queries. For the search queries about immigration, nearly all respondents (98%) reported at least one effective search query that will generate immigration-related search results if entered into a search engine. In fact, for 80% of respondents all three search queries were effective, and only 2% respondents did not produce any effective queries. Similarly, most respondents were able to produce one effective search query about climate change (97.3%). 4.5% was unable to formulate any effective search queries, which is slightly higher than for the immigration queries (2%).

We encountered only a small minority of ‘poor searchers,’ who might not be familiar or experienced with using search engines which hinders them in formulating meaningful search queries. This group may also be those who are helped by features such as autocomplete. However, we also cannot exclude the possibility of measurement error. For example, some respondents described their information desires (e.g., “something about crime”) instead of reporting a search query (e.g., “crime”). These respondents misunderstood this task in this survey setting. Though, overall, this is true for only a small minority of respondents.

Furthermore, respondents format their queries in different ways. The most common is to formulate a search query as a collection of keywords. However, we also notice an arguably large group who formulate their queries as questions; 13.8% (for both issues) of users produced at least one question search query. It is also important to note that it is not unusual for Dutch citizens to use search engines with English terms because it substantially increases the number of relevant search results. This can complicate the analysis, and one can also doubt the effectiveness depending on the issue (e.g., Dutch immigration). In fact, we noticed that this was limited for immigration queries (1.3%), whereas the share of English search queries was

much higher for climate change queries (7.1%). This is largely explained by respondents' usage of "climate change" and "global warming," which are well-known English terms. We also measured the (average) number of words. With an average of 2.14 ( $SD = 1.45$ ) words per immigration search query and 2.21 ( $SD = 1.44$ ) words per climate change query, these search queries seem to resemble authentic queries.

Finally, our approach consisted respondents reporting three search queries which we combined in subsequent analyses. We hypothesised that respondents need to formulate more than one query to go beyond generic keywords because search engine use is driven by a specific information need. Alternatively, one can imagine that the first query come closest to a real-life setting given that it is the respondent's first thought. To shed light on this matter, we compare search query indicators across different query selection approaches: all three (as presented in paper), first only and third only (see Table B1).

The distribution of search query indicators is more or less the same when selecting the first, third or all three search queries.<sup>6</sup> For immigration-related searches, it is notable that queries formulated first are more often about statistics and use the generic term "immigrant" whereas queries formulated last are more often about admission. For climate-related searches, the first query is more often about trends and current status whereas the third is slightly more about solutions, individual behaviour, and other environmental problems.

It is further notable that the share of specific search queries (i.e., addressed a subtopic) increases from 45.4% in the first, 63.7% in the second to 75.4% in the third reported search query for immigration-related searches, and from 63.9% to 84.5% to 89.9% for climate-related searches. These statistics seem to support our expectation that asking for multiple search queries will allow us to tap respondents' specific information needs. However, the extent to which these reflect a natural search setting is an empirical question that goes beyond the scope of this paper. In order to answer these questions, we need more research on the drivers and motivations of online search for political topics and news.

---

<sup>6</sup> Note that it is not possible to compare the exact percentages of the first or third only column with those of all three queries because the latter is based on three queries rather than one.

Table B1

*Comparison of the frequency (%) of search query indicators across search query selection approaches*

Immigration ( <i>n</i> = 1,607)				Climate change ( <i>n</i> = 1,729)			
Indicator	All	First	Third	Indicator	All	First	Third
Admission	27.9	14.6	19.1	Consequences	41.4	24.4	23.3
Statistics	21.2	24.2	10.1	Politics & policy	35.5	23.3	17.9
Integration	14.6	10.5	8.4	Trends and current status	26.5	18.4	13.4
Accommodation center	12.3	4.5	7.4	Environmental problems	18.4	7.3	10.2
Causes	7.8	4.1	4.4	Solutions	15.1	5.7	8.4
Crime	6.5	3.3	3.6	Carbon	13.1	5.4	5.2
Politics	6.3	2.7	4.6	Individual behaviour	12.1	3.9	7.8
Origin	6.2	4.1	2.6	Energy	11.2	6.0	7.5
Housing	6.1	3.3	4.5	Climate change denial	4.2	2.6	2.3
Culture and religion	5.5	2.7	4.2	Activism	4.1	0.9	2.8
Problems	5.2	2.6	3.0	Debate	3.9	2.3	1.8
Economy	4.2	1.5	3.5	Nitrogen	3.9	1.8	1.6
Racism	3.6	3.3	2.3	Agriculture	3.1	0.9	2.1
Debate	3.4	3.0	2.1	Causes	2.9	1.6	0.8
Financial support	3.2	1.5	1.8	Transport	2.6	0.5	1.8
News	2.3	1.4	1.5	Industry	1.8	0.3	1.4
<i>Vluchteling</i>	33.2	12.5	13.4	Climate change deniers	1.1	0.5	0.6
<i>Asielzoeker</i>	27.9	12.1	10.3				
<i>Immigrant</i>	27.5	16.9	9.8				
<i>Buitenlander</i>	12.2	3.4	5.5				
<i>Allochtoon</i>	6.7	3.0	2.1				
<i>Geluksoeker</i>	1.9	0.4	0.8				
<i>Statushouder</i>	1.6	0.6	0.6				
<i>Expat</i>	1.6	0.6	0.4				

*Note.* The frequencies do not add up to 100% because multiple indicators can apply to the same search query and scores are based on three search queries per respondent.

## References

Reja, U., Manfreda, K., Hlebec, V., Vehovar, V. (2003). Open-ended vs. Close-ended Questions in Web Questionnaires. *Developments in applied statistics*, 19(1), 159-177.