

Dis-Empowerment Online: An Investigation of Privacy & Sharing Perceptions & Method Preferences

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Abstract. While it is often claimed that users are empowered via online technologies, there is also a general feeling of privacy dis-empowerment. We investigate the perception of privacy and sharing empowerment online, as well as the use of privacy technologies, via a cross-national online study with N=907 participants. We find that perception of privacy empowerment differs from that of sharing across dimensions of meaningfulness, competence and choice. We find similarities and differences in privacy method preference between the US, UK and Germany. By mapping the perception of privacy dis-empowerment into patterns of privacy behavior online, this paper clarifies the similarities and distinctions in privacy technology use, and provides an important foundation for future research and the design of privacy technologies. The findings may be used across disciplines to develop more user-centric privacy technologies, that support and enable the user.

Keywords: privacy, sharing, user, empowerment, privacy-technology, quantitative

1 Introduction

Internet users often express discomfort with the data collection that enables personalization, and a large portion takes some kind of action such as clearing cookies and browsing history [17]. However, the methods employed by individuals may not be enough to protect one's privacy, because, a particular web browser on a specific machine comprises a unique fingerprint that can be traced by web servers across the web, and this information is conveyed through headers that are automatically exchanged by every web browser and web server behind the scenes [14].

In general, privacy experts perceive an overall sense of privacy dis-empowerment online [6]. The perception of privacy *dis*-empowerment has mainly been attributed to business models and the social web that favour sharing and data

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analytics, to privacy of personal content [12, 16]. Other reasons include human challenges to the adoption of privacy technologies, and human-computer mismatches. We posit that privacy dis-empowerment is evidenced in the failure to use privacy technologies [1, 10].

Use of privacy technologies is thought to be moderated by user perception of technology. In particular, perceived usefulness and effectiveness do not match the technology’s offering, and users exhibit poor trust in the technology [1, 3, 10], and in-correct mental models [1]. However, individuals are likely impacted by their own self-perception, in addition to their perception of the technology. As a result, they likely engage with some privacy technologies more than others, employ privacy technologies in a certain way, or develop non-technology methods of protection.

Contributions: In this paper, we seek to better understand how the perception of privacy (dis)-empowerment is mapped out into patterns of privacy behavior online. We employ a quantitative method as we investigate how individuals protect their privacy from others - whether individual others or organisations - in particular what privacy methods they use. We investigate the link between perception of dis-empowerment and behavior across 40+ privacy methods elicited from users themselves. The paper makes the following contributions: (1) We provide a cross-national report of users’ perception of empowerment. (2) We find that individuals use 22 privacy methods on average, where 40 to 50% of the 10 topmost preferred methods are non-technology methods that are reported to be used by 71% to 85% of the surveyed participants. (3) We identify similarities and differences in privacy and sharing method preferences between the three countries.

This paper therefore provides valuable insights into individuals’ methods of protecting their privacy online, that includes both non-technology methods and the use of privacy technologies. This helps to ground the perceptions of privacy dis-empowerment into behavior patterns. The paper also helps to identify privacy technologies that appear to be more accessible to users.

Outline: In the rest of the paper, provide the aim and method of our study, followed by the results and a discussion, and conclusion.

2 Aim

Our research aim is to compare privacy and sharing empowerment perceptions and to map perceptions of privacy *dis*-empowerment onto usage of privacy and sharing methods. We do so via the research questions below.

2.1 Privacy vs Sharing Empowerment

Thomas & Velthouse [20] defined *Psychological Empowerment* as increased intrinsic task motivation and proposed a theoretical model with four perceptions or cognitions, namely *perception of impact, competence, meaningfulness, and choice* [20]. The model captures individuals’ interpretive processes via which

they assess the actions they engage in. Compared to other psychological empowerment models, Thomas & Velthouse’s model focuses on intrinsic motivation and involves positively valued experiences that individuals derive directly from a task, and impact behavior.

With the power imbalance between online users and others (including more able other individuals perceived as threatening and organisations), individuals likely perceive privacy and sharing empowerment differently online. We investigate as **RQ1**, “How do individuals’ perception of privacy and sharing empowerment differ?” via the hypotheses:

$H_{1,0}$: There is no difference in individuals’ perception of privacy and sharing empowerment.

$H_{1,1}$: There is a significant difference in individuals’ perception of privacy and sharing empowerment.

2.2 Privacy & Sharing Methods, Similarities & Differences

We investigate as **RQ2**, “what methods are mostly used to protect and share information online?” and **RQ3**, “How similar are individuals’ [privacy/sharing] methods usage and preference? What patterns of use emerge? Are there similarities or differences between countries?”

3 Method

We conduct two survey studies online via an evidence-based method [7, 8]. The first study is mainly aimed at identifying a preferred list of privacy methods. The second and main study employs the compiled list of methods to query a representative sample of participants about their use of the range of privacy methods identified.

The studies have a within subject design, where participants answered both the privacy and sharing empowerment questions. We compared privacy and sharing empowerment for each participant. However, we compared preferred privacy and sharing methods between countries, thereby including a between-subject analysis. We randomly assigned participants to answer either the privacy or sharing empowerment questions first.

3.1 Participants

Recruitment For the first study, we sampled $N = 180$ participants, comprising $N = 58$ US participants, $N = 62$ UK participants and $N = 60$ German (DE) participants. The US sample was recruited from population of Amazon Mechanical Turk workers, while the UK and DE sample were from Prolific Academic. The data quality of Prolific Academic is comparable to Amazon Mechanical Turk’s, with good reproducibility [15].

For the second study, we recruited an $N = 907$ sample from the US, UK and DE via Prolific Academic. The sample was representative of age, gender

and ethnicity demographics of the UK and US countries, as provided by Prolific Academic. For the DE sample, we did not achieve a representative sample in terms of gender and age. While we use that sample to investigate our research questions, we foresee extending to representative samples of other countries in the future.

The studies lasted between 10 to 20 minutes. Participants were compensated at a rate of £7.5 per hour, slightly above the minimum rate of £5 per hour suggested by Prolific Academic.

Demographics Table 1 provides a summary of the demographic details for the two studies, with sample size N , mean age, gender, education level and ethnicity. 5% of the German sample had an education level lower than high school for the first study and 1% for the second study. For the second study, 6 UK participants reported to have a PhD, 4 for the US and 9 for DE.

Table 1: Participant Characteristics

	Country	N	Mean Age	Gender		%Education Level				% Ethnicity				
				#Female	#Male	HighSchool	College	Undergrad	Masters/PhD	White	Black	Asian	Mixed	Other
First Study	US	58	35.53	29	29	24.1	31.0	36.2	8.6	82.8	5.2	5.1	5.2	1.7
	UK	62	30.65	43	19	22.6	19.4	41.9	16.1	88.7	3.2	3.2	4.8	-
	DE	60	30.68	27	33	30.0	13.3	28.3	21.7	96.7	-	-	3.3	-
Second Study	US	303	43.72	155	148	39.9	22.1	20.1	14.2	69.3	14.9	8.9	4.3	2.6
	UK	303	44.21	154	149	26.7	17.5	32.0	18.5	77.6	5.3	10.9	4.3	2.0
	DE	301	28.91	115	186	31.2	15.6	28.6	23.6	93.0	0.7	1.9	3.7	0.7

3.2 Procedure

The aim of the first study was to identify and compile a list of privacy and sharing methods preference. We did so via an open-ended question and across three countries. The first study consisted of (a) a questionnaire on demographics, (b) a description of privacy online, and the four psychological empowerment questions, (c) an open-ended query to list three to five tools most often employed to achieve the purpose of privacy online, (d) a description of sharing online, and the four psychological empowerment questions, (e) an open-ended query to list three to five tools most often employed to achieve the purpose of sharing online.

The second study followed the same format of the first study, except that we changed the open-ended queries of the first study to close-ended privacy and sharing methods questions, for participants to select the methods they mostly use from the whole list provided. We also shifted to a larger sample for the three countries.

We defined privacy and sharing for the two studies, thereby focusing participants to a specific meaning. We developed the definition of [privacy/sharing] online with inputs from Coopamootoo & Groß’s findings of the cognitive content of individuals’ [privacy/sharing] attitude [9]. In particular, privacy attitude has contents of ‘others as individuals or organisations who pose a threat, while sharing attitude includes ‘others as connections including friends, family’.

We defined privacy online as “to control access to information that are sensitive or personal, to be informed of other individual and business practices such

as collection, processing and use of personal information disclosed, and to have the choice on disclosure and how one's information is dealt with." We defined Sharing online as *"to create content and share with other web users (such as sharing one's opinion or expertise) and also to share personal information or life events with close connections, friends and family."*

3.3 Measurement Apparatus

Perception of Psychological Empowerment Measures of psychological empowerment have mainly been employed within management and social science research [19, 13]. In particular, Spreitzer proposed a four-factor scale based on Thomas & Velthouse's conceptualization [20]. The scale has been widely applied in the context of organizational management [19]. It has also been evaluated for construct validity [11]. In addition, Spreitzer's formulation was observed as seminal to research on psychological empowerment [18]. However, so far, sparse application appear in relation to technology, such as Van Dyke et al.'s measure of consumer privacy empowerment in E-Commerce [21].

The Psychological Empowerment Scale consists of 12-items focused on the four dimensions of empowerment defined by Thomas & Velthouse [20], in particular areas of (1) meaning, (2) competence, (3) self-determination/choice, and (4) impact. Whereas Van Dyke et al. apply these four dimensions to the notice, choice and access concepts to then develop four perceived privacy empowerment items [21], we directly adapted Spreitzer's scale [19] for online [privacy/sharing] activities. We used the four cognitions of the model to create a task assessment questionnaire directed towards the purpose of either privacy or sharing online.

We set the [privacy/sharing] questions as follows:

'Purpose' refers to that of achieving [privacy/sharing] online as detailed above. 'Actions' are those that one would take with the aim to accomplish that purpose, that is [privacy/sharing] online.

Please provide your responses on the scale from 1 to 100.

- (1) *How do you perceive the impact of the actions you have taken online in the past to accomplish the purpose detailed above?*
- (2) *How do you perceive your skills to successfully achieve the purpose detailed above?*
- (3) *To what extent is the purpose detailed above meaningful to you?*
- (4) *How do you perceive your choice to determine what actions to take to successfully accomplish the purpose detailed above?*

We used a Visual Analogue Scale (VAS) [22] with boundaries from 1 to 100. The 1 minimum value was set to 'no impact at all', 'not skilled at all', 'not meaningful at all' or 'I have no choice at all', pertaining to the four questions above. The 100 maximum value was set to very 'big impact', 'very skillful', 'very meaningful' or 'I have lots of choices.

Compared to Likert-type scales which have coarse-grained discrete measurement data produced by only three to seven categories, the line continuum of a VAS enables the rater to make more fine-grained responses [4]. This aspect of

VAS helps to avoid the systematic bias of values resulting from scale coarseness [2] and facilitates collection of measurement data with higher variability, which theoretically enhances their reliability [5].

Privacy & Sharing Behavior We queried participants on the individual privacy methods they most often use, eliciting participants’ own methods via open-ended question in the first study and requesting preference report from the compiled list in the second study. In the second study, we asked participants to rate the list of privacy and sharing methods provided with whether they use them ‘very often’ or ‘very rarely/not at all’.

4 Results

4.1 Empowerment Perception

We investigate RQ1 with respect to the US, UK and DE samples in the second study, “How do individuals’ perception of privacy versus sharing empowerment differ?” We conduct a paired-samples *t*-test for privacy and sharing for each of the four cognitions for the three countries. We summarize the differences in perception of privacy and sharing empowerment cognitions in Table 2 below.

Table 2: Task Assessment Differences between Privacy Activities & Sharing Activities

Assessment Component	Privacy		Sharing		<i>t</i> (<i>df</i>)	<i>p</i>	Difference		95% CI		
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			ΔM	<i>SE</i>	LL	UL	
United States					<i>t</i> (302)						
Meaningfulness	76.36	21.739	63.94	30.823	8.489	< .000***	15.419	1.816	11.845	18.993	
Competency	58.81	23.508	66.05	24.380	-5.087	< .000***	-7.238	1.423	-10.037	-4.438	
Choice	61.78	22.397	72.49	22.532	-7.331	< .000***	-10.706	1.460	-13.580	-7.832	
Impact	58.16	22.489	58.65	25.862	-.287	.774	-.498	1.734	-3.911	2.914	
United Kingdom					<i>t</i> (302)						
Meaningfulness	70.06	24.786	59.84	26.875	5.862	< .000***	10.211	1.742	6.783	13.639	
Competence	56.87	22.714	62.20	23.084	-4.013	< .000***	-5.330	1.328	-7.944	-2.716	
Choice	59.10	21.562	66.81	21.907	-5.747	< .000***	-7.716	1.343	-10.358	-5.047	
Impact	54.79	21.885	57.42	24.265	-1.604	.110	-2.637	1.644	-5.872	.598	
Germany					<i>t</i> (300)						
Meaningfulness	69.63	22.998	48.59	29.984	9.947	< .000***	21.040	2.115	16.877	25.202	
Competence	58.73	23.280	62.85	24.678	-2.662	.008**	-4.123	1.549	-7.171	-1.075	
Choice	55.57	19.782	68.94	23.202	-8.870	< .000***	-13.365	1.507	-16.331	-10.400	
Impact	53.26	21.793	49.03	24.558	2.550	.011*	4.223	1.656	.964	7.481	

CI refers to the Confidence Interval, *LL* to the Lower Limit, *UL* to the Upper Limit.

4.2 Privacy & Sharing Methods

We provide the full list of privacy methods compiled in the first study in Table 3, with the $N = 180$ sample. This list of 43 privacy methods was then used to query participants in the second study. We loosely categorise the privacy methods into four possible protection categories, namely (1) anonymity (ANO), (2) browsing history and tracking prevention (BHP), (3) communication privacy & filtering (COP), and (4) preventing leaking and stealing of data (PLS).

We also compile participants’ responses of 3 to 5 most used sharing methods in the first study. We end up with 39 sharing methods coded across the three countries. We categorize the sharing methods across five themes, as shown in Table 4. The ‘Community’ theme includes social networks or community sharing. With respect to Facebook, some participants referred to Facebook in general, while others specified updates or photos. The ‘Messaging’ theme includes email and instant messaging methods, referring to a particular tool or instant messaging in general. The other sharing themes are ‘Photos’, ‘File-Sharing’ and ‘Streaming’.

The rest of the results section pertains to the second and main study.

Table 3: Privacy Methods Categorised by Design Type and Privacy Protection.

Privacy Protection	Built-in	Standalone	User-Defined
Anonymity	Encryption	Erasery	Not Store Info
	Clear/Delete info/history	TOR	Anonymous profile names
	Pseudonyms/Onion	Proxy	NotGivePI / LimitSharing / MinimalInfo
		IPHider	Several/Bogus / LimitedUse Emails
		Virtual machine	Fake Info
			Limit Use of SNS Accounts
			SwitchOffCamera/Devices/PortableHD
			No Access Acc In Public Place/Networks
			Not use FB
			Not Engaging Online/Careful/Not Signing Up
Browsing History & Tracking Prevention	Private Browsing/incognito	DuckDuckGo	
	Anti-tracking addon	Ghostery	
	No location tracking	NoScript	
	Clear/Limit cookies		
Communication & Filtering	Adblock	Firewall	
	HTTPS	VPN	
Prevent Leaking & Stealing of Data	Privacy settings	Password manager	Not save or reuse password
	Opt out	Paypal	Read terms of service
	Private profiles	Anti-spyware	Request data collected, GDPR
		Anti-malware	no newsletter, think twice
		Kapersky	Website care/No suspicious sites

We investigate RQ2 “What methods are mostly used to protect one’s privacy and to share information online?” with regards to privacy.

Table 5 shows a depiction of the top 10 privacy methods preferences across the three countries, where we observe that 4 of the privacy methods appear in the top 10 most reported methods in all three countries. These methods are (1) privacy settings, (2) limit sharing, (3) website care, and (4) no newsletter.

Table 4: Sharing Methods Categorised by Theme.

Community	Photos	Messaging	File-Sharing	Streaming
Discord	Facebook photos	Email	box.com	Twitch
Facebook	Flickr	Facebook messenger	cloud	Vimeo
Facebook updates	Google photos	Instant messaging	dropbox	YouTube
Forums	iCloud photos	Telegram	FTP	
Google hangouts	Instagram	WhatsApp	Google Drive	
LinkedIn	Social network photos		Microsoft OneDrive	
News site comments	Pinterest			
Personal blog	Photo blog			
Reddit	Snapchat			
Skype				
Slack				
Social networks				
Social network updates				
Teamviewer				
Tumblr				
Twitter				

In addition, we find 8 privacy methods similarities in the top 10 most reported methods for both the UK and US, 6 methods similarities between the UK and DE, and 5 methods similarities between the US and DE.

Table 6 shows a depiction of the top 10 sharing methods preferences across the three countries, where we observe that 5 of the sharing methods appear in the top 10 of all three countries, and 8 appear in the top 10 most reported methods for both the US and the UK.

We investigate the second part of RQ3 with respect to privacy methods, that is, “Is there a difference in [privacy] method preference between the two countries?” We compute a Chi Square test on each of the 43 privacy methods.

We find that for 23 privacy methods, there is a statistically significant association between privacy method employed and country of residence, after multiple comparisons correction, as detailed in Table 7 in the Appendix. The table shows both the percentage of participants within each country who listed the privacy method, as well as the percentage taken by each country for each listed method. It also shows the privacy protection category of the method.

In addition, the table provides a measure of association in privacy method preference across country of residence, with effect size Cramer V depicting the magnitude of association between the privacy method and the country, where $V < .20$ corresponds to a weak association, $.20 < V < .40$ corresponds to a moderate association and $V > .40$ corresponds to a strong association.

5 Discussion

Privacy vs Sharing Empowerment: That participants perceive privacy to be more meaningful than sharing across the three countries, yet perceive lower

Table 5: Top 10 Privacy Methods by Country starting with most frequently mentioned

Method	United States		United Kingdom		Germany			
	Design	CAT	Method	Design	CAT	Method	Design	CAT
1 Website care	UD	PLS	1 Website care	UD	PLS	1 AdBlock	BI	COP
2 Privacy settings	BI	PLS	2 Limit Sharing	UD	ANO	2 Bogus Emails	UD	ANO
3 Limit Sharing	UD	ANO	3 Privacy settings	BI	PLS	3 Privacy settings	BI	PLS
4 Research before engaging	UD	ANO	4 Clear Info/History	BI	ANO	4 Limit Sharing	UD	ANO
5 Anti-Malware	ST	PLS	5 Paypal	ST	PLS	5 No Newsletter	UD	PLS
6 No Newsletter	UD	PLS	6 Research before engaging	UD	ANO	5 Paypal	ST	PLS
7 AdBlock	BI	COP	7 No Newsletter	UD	PLS	5 Website care	UD	PLS
8 Clear Info/History	BI	ANO	8 Firewall	ST	COP	5 Firewall	ST	COP
9 Clear/Limit Cookies	BI	BHP	9 Anti-Malware	ST	PLS	9 HTTPS	BI	COP
10Not Access Accts in Public Place	UD	ANO	10Not Access Accts in Public Place	UD	ANO	10Pseudonyms	BI	ANO

BI, ST & UD refer to design type of built-in, standalone and user-defined respectively.

ANO, BHP, COP & PLS refer to privacy protection categories of anonymity, browsing history and tracking prevention, communication privacy & filtering, and preventing leaking & stealing of data respectively.

competency and choice with regards to privacy can be expected given the looming sense of privacy dis-empowerment online users are habituated to. However by providing statistical evidence from a relatively large representative sample, we demonstrate that privacy dis-empowerment is not just a passing or one-time feeling but is perceived across countries and demographics. This finding can contribute to explaining the privacy paradox, that although individuals are concerned about their privacy, their observed behavior differ, as they have poor perceptions of competency and choice.

In addition, although the internet is thought to empower individuals, we do not observe a positive difference in perceived sharing versus privacy impact. This aspect requires further investigation in eliciting users’ understanding of the results of their sharing. Only DE shows a higher perceived impact for privacy.

5.1 Methods Preference & Behavior

DE and US participants reported using 3 and 2 more privacy methods on average than UK participants respectively, where although there are similarities in that 4 items are among the top 10 most used privacy methods in countries, they differ across 23 methods with the US reporting higher usage in 17 of them.

Among the similarities, we find that user-defined or non-technology methods (1) of being careful of websites, (2) to limit sharing, (3) research before engaging (2 out of 3 countries), (4) not subscribe to newsletters, and (5) not access accounts in public places appear in the most used methods in both countries. For the three countries, these user-defined methods made up 40% to 50% of the top 10 most preferred privacy methods thereby demonstrating that users rely more on their own means to protect themselves than privacy technologies. This raises questions about the reasons for reliance on user-defined methods rather than

Table 6: Top 10 Sharing Methods by Country starting with most frequently mentioned

United States	United Kingdom	Germany
1 Email	1 Email	1 Email
2 Youtube	2 WhatsApp	2 WhatsApp
3 Google Drive	3 Facebook Messenger	3 YouTube
4 Facebook Messenger	4 YouTube	4 Reddit
5 Reddit	5 Instant Messaging	5 Instagram
6 Instant Messaging	6 Facebook updates & newsfeed	6 Google Drive
7 Forums	7 Google Drive	7 DropBox
8 Instagram	8 Instagram	8 Instant Messaging
9 Facebook updates & newsfeed	9 Twitter	9 Discord
10 Facebook photos	10 Facebook photos	10 Forums
10 Social network sites (exclu. FB)		
10 Twitter		

PETs, such as “are users concerned enough and aware of PETs to use them?” “how were their previous experience with PETs?”

DE shows a higher use of 19 methods, a higher portion of which falls in the left cluster. This may indicate higher awareness of and skill to use PETs, as well as an outcome of privacy culture and regulation.

6 Conclusion

This paper provides an initial investigation of a mapping between perceived privacy dis-empowerment online and preferences for privacy and sharing methods, as well as offers a cross-national investigation. We identify a few non-technology privacy methods that are preferred. This raises questions for future research, in particular why individuals prefer methods that seem more accessible and integrated within non-privacy focused environments and non-technology methods, rather than more advanced and more technical privacy technologies.

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7 Appendix

Table 7: Privacy Method Differences across Countries with Chi Square Test, sorted by effect size V

Privacy Method	CAT % Participants	% in Country		% in Method		$X^2(2) p$	Cramer V	
		US	UK	DE	US			UK
1 Pseudonyms	ANO 53.1	47.2	36.6	76.1	29.6	23.0	47.4	101.087 .000*** .334
2 Anonymous Profiles	ANO 59.2	57.8	44.2	75.7	32.6	25.0	42.5	65.522 .000*** .263
3 Have several emails	ANO 72.5	70.6	60.4	86.7	32.5	27.8	39.7	53.343 .000*** .243
4 NoScript	BHP 15.9	12.9	6.9	27.9	27.1	14.6	58.3	52.823 .000*** .241
5 Give fake info	ANO 45.3	42.2	33.7	60.1	31.1	24.8	44.0	44.234 .000*** .221
6 Adblock	COP 76.5	77.6	65.0	87.0	33.9	28.4	37.8	41.045 .000*** .213
7 VPN	COP 37.7	32.7	28.4	52.2	28.9	25.1	45.9	41.250 .000*** .213
8 HTTPS	COP 68.1	69.0	56.8	78.7	33.8	27.8	38.3	33.724 .000*** .193
9 TOR	ANO 13.5	10.6	7.6	22.3	26.2	18.9	54.9	31.172 .000*** .185
10 Virtual Machines	ANO 13.8	12.2	6.9	22.3	29.6	16.8	53.6	30.803 .000*** .184
11 Anti-tracking extension	BHP 31.2	30.7	21.1	41.9	32.9	22.6	44.5	30.308 .000*** .183
12 Not use Facebook	ANO 43.0	43.2	32.7	53.2	33.6	25.4	41.0	25.857 .000*** .169
13 Paypal instead of online banking	PLS 74.6	66.3	74.6	83.1	29.7	33.4	36.9	22.302 .000*** .157
14 Proxy	ANO 26.7	22.1	21.5	36.5	27.7	26.9	45.5	22.438 .000*** .157
15 Read terms of service	PLS 44.2	50.8	48.5	33.2	38.4	36.7	24.9	22.385 .000*** .157
16 Not access accts in public place	ANO 66.7	73.9	69.3	56.8	37.0	34.7	28.3	21.308 .000*** .153
17 Request data collected	PLS 19.1	17.8	12.5	26.9	31.2	22.0	46.8	20.660 .000*** .151
18 DuckDuckGo	BHP 21.5	26.1	12.9	25.6	40.5	20.0	39.5	20.092 .000*** .149
19 Ghostery	BHP 11.8	10.2	6.9	18.3	29.0	19.6	51.4	19.739 .000*** .148
20 Kapersky	PLS 14.1	9.9	11.6	20.9	23.4	27.3	49.2	17.617 .000*** .139
21 Firewall	COP 74.9	69.6	71.9	83.1	31.1	32.1	36.8	16.504 .000*** .135
22 Switch off camera	ANO 34.7	68.0	56.8	69.4	35.1	29.3	35.6	12.743 .002** .119
23 Anti-spyware	PLS 65.3	72.9	62.7	60.1	37.3	32.1	30.6	12.241 .002** .116

These differences are statistically significant under Bonferroni correction.

Effect size $Cramer V < .20$ corresponds to a weak effect, $.20 < V < .40$ corresponds to a moderate effect.