

# What are PETs for Privacy Experts and Non-experts?

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## ABSTRACT

- Which technologies are viewed as enhancing privacy?
- Differences between privacy experts and non-experts
- Opportunities for design

## RELATED WORK

### Existing Privacy literature numerous privacy adoption aspects:

- What shapes online privacy practice: Experience of privacy violation rather than expertise (1) and socioeconomic factors (2).
- Differences in how experts and novices think about privacy or use specific applications: non-experts displayed a strong distinction between private and public spaces, while experts were more likely to illustrate more nuanced data privacy spaces and control over information (3). And experts showed a deeper understanding of Tor's underlying operation and focused more on the technical details of Tor's operations, while non-experts were more likely to situate Tor within a broader sociotechnical landscape (4).
- Models that explain rationales that may guide adoption of PETs (5) like lack of awareness, lack of technical skill, the complexity and diversity of risks involved in privacy management, direct and indirect costs, and privacy not being a cultural value(6). Also, usability issues (7)

### Remaining Research Question

How do people, especially laypersons, determine what counts as a privacy-enhancing technology?

## OBJECTIVE

Understand what makes a technology a PET---not based on scholarly definitions but grounded in everyday practices and perceptions by cataloging the technologies identified as privacy enhancing by privacy experts and by non-experts.

## METHOD

We used a survey to inventory what technologies people report using in their everyday lives to protect their privacy.

### Recruitment

- We recruited privacy experts by soliciting participants from the PETs and HCI privacy research communities
- We recruited non-experts using a demographically-matched panel procured by Qualtrics.
- Recruitment efforts yielded 46 responses from privacy experts and 77 from non-experts (see Table below for demographics for both samples)

46 Privacy expert	Gender	Man: 22 Woman: 20 Non disclosed: 2
	Age	Min: 22 Max: 69 Avg: 35
	Education	Doctorate degree: 25 Master's degree: 13 Bachelor's degree: 4 Some college/university: 1 (blank): 3
77 Non-privacy expert	Gender	Man: 39 Woman: 38 Non disclosed: 0
	Age	Min: 22 Max: 67 Avg: 36
	Education	Doctorate degree: 38 Master's degree: 25 Bachelor's degree: 13 some secondary/high school: 1

### Survey Protocol

An identical survey was deployed to the expert and non-expert samples.

The survey asked participants to list technologies they are familiar with in multiple categories: browsers with special features like ad-blockers, pop-up blockers, or private browsing mode, anonymous browsers, privacy-enhancing search engines, encrypted communications, and other privacy technologies.

Participants were also asked how frequently and why they used each of the technologies they mentioned.

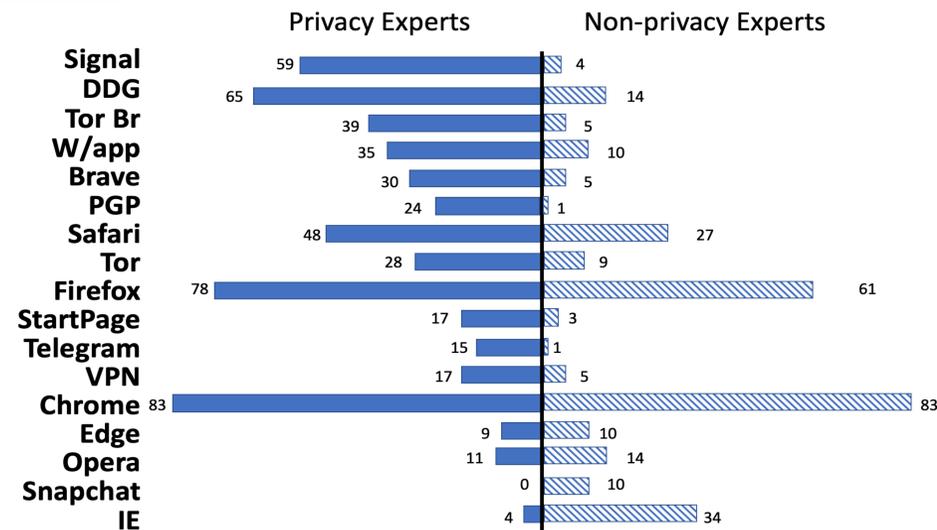
### Data Analysis

The analysis presented here uses descriptive statistics to report on the technologies that participants are familiar with and their frequency of use.

## FINDINGS

We focus only on the technologies that are mentioned by at least 10% of either sample (17 technologies)

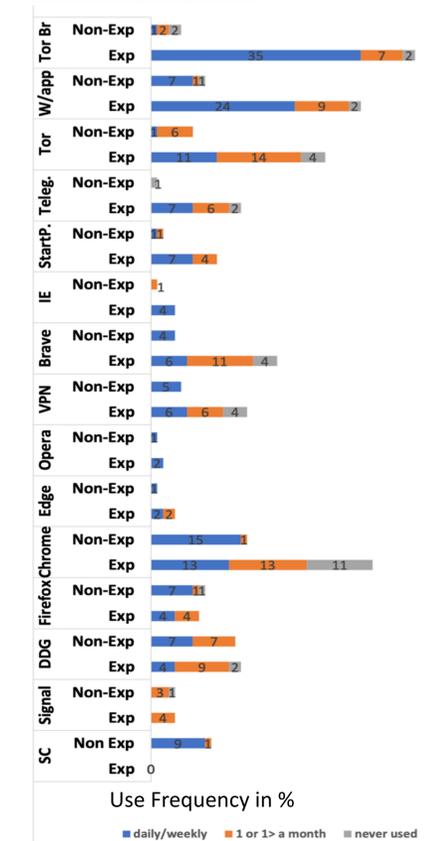
### 1- PETs Familiarity



## SUMMARY OF FINDINGS

- Most of the technologies that were popular among non-experts advertise main functions other than privacy protection.
- Most of the popular technologies cited by experts promote privacy protection as a primary function

### 2- PETs frequency of use



## IMPLICATION

To ensure that PETs are adopted more broadly, designers of Internet tools should also consider embedding robust, sophisticated privacy features in technologies that have some primary function besides privacy enhancement.

## REFERENCES

- 1) Kang, R., Dabbish, L., Fruchter, N., & Kiesler, S. (2015). "My Data Just Goes Everywhere." User mental models of the internet and implications for privacy and security. In *Eleventh Symposium On Usable Privacy and Security (SOUPS 2015)* (pp. 39-52).
- 2) Ames, M. G., Go, J., Kaye, J. J., & Spasojevic, M. (2011, March). Understanding technology choices and values through social class. In *Proceedings of the ACM 2011 conference on Computer supported cooperative work* (pp. 55-64).
- 3) Oates, M., Ahmadullah, Y., Marsh, A., Swoopes, C., Zhang, S., Balebako, R., & Cranor, L. F. (2018). Turtles, locks, and bathrooms: Understanding mental models of privacy through illustration. *Proceedings on Privacy Enhancing Technologies, 2018*(4), 5-32.
- 4) Gallagher, K., Patil, S., & Memon, N. (2017). New me: Understanding expert and non-expert perceptions and usage of the Tor anonymity network. In *Thirteenth Symposium on Usable Privacy and Security (SOUPS 2017)* (pp. 385-398).
- 5) Caulfield, T., Ioannidis, C., & Pym, D. (2016, November). On the adoption of privacy-enhancing technologies. In *International Conference on Decision and Game Theory for Security* (pp. 175-194). Springer, Cham.
- 6) Vemou, K., & Karyda, M. (2013, August). A classification of factors influencing low adoption of PETs among SNS users. In *International Conference on Trust, Privacy and Security in Digital Business* (pp. 74-84). Springer, Berlin, Heidelberg.
- 7) Clark, J., Van Oorschot, P. C., & Adams, C. (2007, July). Usability of anonymous web browsing: an examination of tor interfaces and deployability. In *Proceedings of the 3rd symposium on Usable privacy and security* (pp. 41-51).

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