

Exploring the Impact of a New Computer Security and Privacy Categorization

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ABSTRACT

In an effort to create a security and privacy categorization of users that better predicts user behaviour than previous categorizations, Lank et al. performed a study and produced a categorization based on two factors: knowledge and motivation. To determine how knowing about this new categorization compares to knowing about Westin's categorization in discussions of security and privacy settings design, a qualitative study was run with six pairs of participants. Three were told about Westin's categorization and three were told about Lank et al.'s categorization. Each pair was asked to discuss the security and privacy settings for Facebook in the context of the categorization they were given. From these discussions, it appears that the participants tend to treat Westin's categories as generalizations, often subdividing the categories during the discussion, whereas those told about Lank et al.'s categorization tend to be more comfortable using the categories as they are, though sometimes the participants will group some of these categories together.

Author Keywords

Security; Privacy; Interviews; Design differences.

ACM Classification Keywords

H.5.m. Information Interfaces and Presentation (e.g. HCI): Miscellaneous

INTRODUCTION

From the 1970s to the 2000s, Westin performed a number of surveys regarding the security and privacy practices of computer users. From these surveys, he created a security and privacy categorization of users that consists of three categories: the Fundamentalists (those very concerned about security and privacy), the Marginally Concerned (those unconcerned about security and privacy), and the Pragmatic Majority (those in between the other two categories) [2]. However, this categorization tends to not predict user behaviour particularly well [1].

To find a categorization that better predicts user behaviour, Lank et al. performed a study resulting in a categorization with five categories. This categorization is based on two factors: knowledge about security and privacy issues and motivation to ensure one's online security and privacy. The five categories are: the Fundamentalists (high knowledge, high motivation), the Lazy Experts (high knowledge, low motivation), the Technicians (medium knowledge, high motivation), the Struggling Amateurs (medium knowledge, medium motivation), and the Marginally Concerned (low knowledge, low motivation) [3].

This paper aims to explore the effect the categorizations have on the design process when designers are given one of these categorizations to use as a model of the users of the system being designed.

THE STUDY

To get an idea of how the knowledge of each of these categorizations affects designers of security and privacy systems, six pairs of participants were gathered to discuss the security and privacy controls on Facebook. Each pair was randomly assigned one of the categorizations (three pairs were told about Westin's categorization, the other three were told about Lank et al.'s categorization). Each pair was asked to consider Facebook's security and privacy controls in the context of the categorization they were assigned and evaluate the existing controls or suggest improvements to the controls. Nine of the participants were computer science undergraduate students, two were computer science graduate students, and one was a recent university graduate now working as a computer programmer. Participants were selected from these areas as they are people who could reasonably be creating security and privacy controls for computer applications in the near future. One participant was female, the others were male. In the following results section, P1-P6 refer to participants who were told about Westin's categorization, while P7-P12 refer to participants who were told about Lank et al.'s categorization.

RESULTS

For many of the pairs of participants, the first point of discussion was where they would place themselves in the categorization. Although this was not directly related to the intended topic of discussion, it led to some interesting quotes. For example, one participant who was told about Westin's categorization commented, "I feel like I'm closer to the Fundamentalist side of the Pragmatic Majority" (P2). This comment indicates that this participant sees the Pragmatic Major-

ity as a group that can be subdivided reasonably. In contrast, one of the participants told about Lank et al.'s categorization stated, "I would say I'm a Lazy Expert" (P9). This participant is much more certain of which category he is in, and does not feel that the categories need to be altered for him to find an adequate description of himself. However, there were also participants who could not fit themselves into just one category in Lank et al.'s categorization. One participant said, "I kinda see myself as a mix between an Amateur and a Lazy Expert" (P11). Another one of the participants given Lank et al.'s categorization commented (though not referring to himself), "I assume [...] you can be, like, in between two [of the categories]" (P9).

Moving into the discussion of Facebook's security and privacy settings, many of the participants immediately dismissed the Fundamentalists as people who "wouldn't have a Facebook account at all" (P4), "probably would just not be on Facebook" (P9), or they were not "even sure that they're going to want to use Facebook at all" (P7). Similarly, many of the participants also dismissed the Marginally Concerned as people who "just don't go into the security settings" (P1), "haven't even looked at [the] privacy settings for Facebook" (P10), or who are "going to use Facebook [...] no matter what" (P6). What is interesting to note here is that, regardless of which categorization the participants were told about, the Fundamentalists were considered impossible to satisfy, while the Marginally Concerned were assumed to be satisfied no matter what the privacy and security controls were. This left those given Westin's categorization with one category (the Pragmatic Majority) to consider, while those given Lank et al.'s categorization had three categories remaining (the Lazy Experts, the Technicians, and the Struggling Amateurs) to discuss.

When discussing the remaining categories, the participants given Westin's categorization typically discussed as though the one remaining category could be subdivided into more categories, while those given Lank et al.'s categorization tended to use the categories as they were, methodically suggesting ideas for each remaining category. A recurring idea for those given Westin's categorization was the idea of a "sliding bar [with options like] complete hermit, complete social, and then a bunch of gradations, like, three, four gradations in the middle" (P3). Another pair of participants described a similar idea that would allow one to "[select] your granularity, [...] if you do it finer and finer, more and more settings keep on appearing" (P1). In contrast, the discussions of the participants given Lank et al.'s categorization tended to methodically address each category independently. For example, one pair's discussion followed this structure: "[Speaking about Lazy Experts] You might want the [...] very quick decisions and things that don't have a lot of consequences at the top level" (P7), "[Speaking about Technicians] We could almost have, like, a special kind of, like, how-to section" (P8), "[Speaking about Struggling Amateurs] The first time they log in, if there's some change to [the security settings...] notify them, [...] enough that they know that it's there so they can actually go seek it out" (P8). Here, the pair thought individually about and devised a solution for each category.

FOLLOW-UP QUESTION

After these interviews, each of the participants was contacted for a follow-up question. Five of the participants responded: three that were told about Westin's categorization in the initial study and two that were told about Lank et al.'s categorization in the initial study. These participants were reminded of the categorization they were told about in the initial study and told about the other categorization. The participants were then asked for their opinion on using each of the categorizations for the design exercise they participated in.

The participants who were initially told about the Westin categorization thought that "the middle group [the Pragmatic Majority] is, just, very general [...] it's very vague" (P5). Another of these participants liked that "in [Lank et al.'s categorization], the individual's knowledge level is captured" (P1) and thought that "with the individual's knowledge level represented, better answers could have been constructed" (P1).

The two participants that were told about Lank et al.'s categorization in the initial study thought that "the advantage of [Westin's categorization] is that it's simpler" (P12), but also thought that with Lank et al.'s categorization, "you could get a bit more detail" (P11). Most interestingly, one of these participants commented, "It seems like Technicians and Amateurs might be [...] combined" (P12). Because the participants given Westin's categorization frequently wanted to subdivide the Pragmatic Majority, it was unexpected to see this opposing desire.

CONCLUSION AND FUTURE WORK

From this study, it appears that when designing a system, there are times when people prefer the finer granularity of Lank et al.'s five-category categorization, while at other times, the coarser granularity of Westin's three-category system is preferred.

In the future, it would be interesting to repeat this study, but tell the participants about both of the categorizations instead of only one, and see how the discussions differ from the discussions presented here.

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Category Descriptions Used in the Study

Lank et al (Weber)

Fundamentalists

- high knowledge, high motivation
- have little trust of security technology
- watch carefully for security indicators on websites
- highly concerned about privacy
- have advanced security knowledge and software manipulation skills

Lazy Experts

- high knowledge, low motivation
- choose convenience over security
- choose being social over privacy
- rationalize inaction through a belief that they are not a target
- take certain actions to protect themselves (strong passwords, etc)
- have advanced software manipulation skills and use this ability to limit their need to interact with security

Technicians

- medium knowledge, high motivation
- read online news and blogs to inform themselves about security
- choose privacy over being social
- have limited trust of privacy settings
- tend to trust their impressions
- if given enough information, are willing to change their behaviours

Amateurs

- medium knowledge, medium motivation
- not sufficiently motivated or knowledgeable to distinguish good advice from bad
- use some software tools to protect their security
- place some limits on the information they give out
- if given enough information, they will act to protect themselves

Marginally Concerned

- low knowledge, low motivation
- make changes based on triggers (ex. Changing password because of a password policy)
- know threats exist, but don't worry about them
- not motivated to do or learn more about security

Westin

Fundamentalists

- distrustful of organizations that ask for personal information
- feel they have been victims of privacy invasion
- pessimistic about the future of privacy protection
- worried about accuracy of computerized information and additional uses of it
- in favour of new laws and regulations to specify privacy rights and enforceable remedies
- generally choose privacy over being social (or other benefits)

Pragmatic Majority

- concerned about privacy
- weigh the benefits of the service being provided against the cost of losing some privacy
- look for protection of their personal information when businesses want to use it

Marginally Concerned

- not very concerned about privacy
- do not feel they have been victims of privacy invasion
- generally choose being social (or other benefits) over privacy