

Social networks of Technology caregivers and caregivees

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ABSTRACT

The paper focuses on exploring the social networks of technology caregivers and caregivees and also work on learning their preferred mode of information exchange. Responses from the participants of the study will throw light on the relationships between different efficacy's (discussed in detail in the paper) that may have an impact on an individual's decision. Participant's responses are recorded through well constructed surveys that have been distributed around by word of mouth or specific social media platforms which will also prove if being a power user has any effect on the end result. The responses will be analyzed and the various efficacy constructs such as self efficacy, community collective efficacy will be kept in mind.

CCS Concepts: • **Social network analysis** → **Privacy and Security**.

Additional Key Words and Phrases: Human Computer Interaction, Efficacy, Power User

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1 INTRODUCTION

Tech caregivers are often a solace for people who may not understand technology as thoroughly as caregivers do and need help making decisions. Previous studies do not put technology and caregiver together; this paper will present an explanation for the term and the impact of people who come under the category. This study seeks to uncover how technologically sound responders perceives themselves (*degree of comfort with technology use, self-efficacy*) and how these, along with the perceived technological soundness of their respective social networks (*community efficacy, community efficacy with privacy and security*) affects their perception of the aforementioned issues of privacy and security.

It should be noted how continuing surge of mobile devices has placed computing technology in the hands of nearly every person in the United States [1]. Along with the burgeoning use of computing technologies, however, we also see a corresponding increase in security risks. Studies have found that insecure mobile applications, for instance, can lead to fatal information security and data privacy issues that can bring upon serious after-effects on users and organizations alike [13]. Technology users' unease appears to be increasing along with this risk, due to factors like user awareness, trust, and privacy concerns, which have had a significant effect on, for example, sharing personal data on social media [16]. It has also been observed that individuals often try to mitigate this risk and sense of unease by seeking technical support for their mobile devices outside the boundaries of formal tech support channels [21] – the individuals who provide this informal form of technical support we will call *tech caregivers*.

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2 BACKGROUND

The goal of this study is to explore technology caregiver's and caregivee's perception of privacy and security along with mobile usage in the context of the social-networks in which they are embedded. Extending this goal, methods of information exchange between technology caregiver and caregivee will be discussed. It will also attempt to shed light on how a social network's collectively perceived proficiencies in these technologies in turn influence the individual. The factors to be discussed are validated constructs used in previous studies including: self-efficacy, self-efficacy with privacy and security, community efficacy, community collective efficacy with privacy and security and power users. Every individual is relying on the internet and their mobile devices to get the information that they need. Online reports state that this has led to the rise of "tech caregivers" [2]. Technology caregivers can be anyone who have knowledge about a topic and lend their expert opinion (when asked) to the people in need of their advice. They are the experts who There has been a study [20] that has found that youth comprising of younger generation adults (ages 18 to 29) have a better knowledge and can answer more questions about the digital world than the older adults (ages 65 and more). It has also been reported in an article that although 70 percent of the technologically able population are happy to exchange advice on technology, 34 percent of them they need help as well [3]. Online safety is another reason why people warm up to the idea of consulting the tech caregivers for advice. This study will focus on the relationship between a tech caregiver and tech caregivee, their mode of communication, the influence of efficacies on their decisions finally the relationship between the efficacies itself that make an impact on the outcome.

2.1 Self-Efficacy of Privacy and Security

Self-efficacy is defined as how well one perceives their ability to execute courses of action required to deal with prospective situations [4]. In his guide to creating self-efficacy scales, Albert Bandura describes how it can be extended to other domains and situations (2006). In this study, we extend the self-efficacy scale to the domain of technological privacy and security to better understand individuals' capacity to manage these technology decisions on their own or otherwise. Examining individual capacity is an important first step to understanding how group capacity is influenced by the sentiments of the individuals within these groups. Self-efficacy has been found to be a factor in healthy aging practices among older adults [18] and a factor in participation in physical and social activities [17]. We will examine how self-efficacy plays a role in technology sharing networks.

2.2 Community Belongingness and Management of Privacy and Security

It is well-known that an individual's social network impacts his or her decision-making process [8][11]. Researchers are understandably curious as to how users' social networks inform their decision-making regarding digital privacy, but the existing literature demonstrates little knowledge of how this impacts small groups. Some studies show evidence that users' capacities to engage in privacy and security practices may be modulated through engagement with their community. It has been found, for instance, that users are more likely to make privacy and security decisions such as deleting an app or changing a password if they have observed others in their network having done so [7]. Another study indicated that users will ask for advice when needed and tend to ask family or friends who they believe are more capable or interested in the topic [10]. Participants cited their trust in these individuals because they perceived them to be knowledgeable in this subject matter trusted those around them that they believed were knowledgeable in the subject. In another study conducted on Facebook, however, users were prompted via announcements to check new security features available to them. The messages were presented to two sets of users: the first received the initial announcement, the second received an additional announcement indicating how many of

their friends had also seen the initial prompt. They found that while the users who were exposed to the second notification were more likely to explore the new security features, there was no change in the actual setting[9].

2.3 Community Collective Efficacy for Privacy and Security

Much of the literature regarding community efficacy focuses on neighborhood watch programs and how communities work together to accomplish a mutually beneficial goal [5]. It has been found, for instance, that individuals who perceived neighborhoods more positively and have strong social ties play an important role in collective efficacy [12]; researchers debate that if strategies can be implemented for communities to focus on building a greater collective efficacy, neighborhood violence and the crime rate would decrease[5]. These studies agree that community efficacy results in safer areas and better relationships between community members. Community collective efficacy is a construct that was used to extend self-efficacy to organizations and groups, referring to beliefs about collective capacities in specific domains[6]. Carroll et al.'s work on community collective efficacy scoped Bandura's scale of perceived self-efficacy to the group, rather than individual level[4].

2.4 Power Users of Technology

Related to self-efficacy and of interest to our work is an individual's style of use and comfort level using that technology – in other words, whether they are a power user.. Five disciplines (psychology, information sciences, media effects, marketing, and consumer research) are drawn to define a power user with high usage in motivation, expertise, efficacy, and behavior with their technology [15].

3 RESEARCH QUESTIONS

RQ1: Among the small groups, what are the relationships between self-efficacy of privacy and security, power user status, collective efficacy, and collective efficacy of privacy and security?

RQ2: How do tech caregivers impact the collective efficacy of privacy and security for the small groups in which they interact?

RQ3: How can design support the role of tech caregivers in small groups when it comes to privacy and security decision-making?

By answering these research questions, I am hoping to learn and help with designing better tools to support tech caregivers ability to support the small social networks that they engage with.

4 METHODS

4.1 Recruitment and Demographics

Participants will be recruited from all over the United States of America by distributing and marketing a survey that has been created using Qualtrics online survey software and the existing topography of users' social infrastructure that supports mobile privacy and security on a large scale will be explored. The goal is to recruit twelve groups, each group containing at least 5-10 members who interact with each other and exchange technology advice. A 10 dollar Amazon gift card will be distributed on completion of the survey and details of the study will be depicted in the survey itself. Data collection started in August 2019. Respondents will answer questions designed to gather interactions among the participant (i.e. ego) and the individual others that they currently and potentially interact with (i.e. alters) while exchanging knowledge about technologies (technology

caregiver and technology caregivee) along with thoughts about maintaining security and privacy on their mobile device.

4.2 Analysis of the collected data

To explore reciprocal information sharing transactions, each respondent will be asked to provide the name and contact information of at least one of the individual others listed in their network, and we will invite that alter to also complete the ego network survey. This approach takes the form of identifying dyads, or pairs of individuals who will each provide their perceptions of the ego network to understand differences in perceived reciprocal information sharing. Ego network surveys will request that participants describe individuals who they give technology advice to or take technology advice from along with the ego could rely upon when maintaining digital privacy and security, in terms of the qualities of those relationships data (i.e. same/different gender, same/different age, level of information sharing, level of trust, etc.) and a description of the relationship itself (i.e. kinship, friendship, co-workers, etc.). Both the parties will be asked questions to determine what kind of technology advice is exchanged and what tools or medium is being used for the same. They will also be asked to give feedback or ideas on how they would like to discuss or share the mentioned technology advice. Transcribing the data (survey response), organizing the data, familiarization with the data, open coding and finally identifying themes are steps that will be taken as a part of thematic analysis[14] to understand both parties' responses. Data will be analyzed using different tools like SPSS to describe network topography in terms of network structural qualities (i.e. ego-net centrality, betweenness, density, and structural hole measures) and relationship descriptors (i.e. the average level of information sharing, an average level of trust, and proportions of given tie types). I will pay particular attention to reciprocal sharing, brokerage roles (role that tends to share expert information and what are the social patterns associated with information sharing), and regression models (comparing the effects of various composition network variables on dependent variable perceived community collective efficacy while controlling for demographic variables).

To understand how users perceived their own ability to make secure decisions, self-efficacy will be measured as it applies to the domain of addressing privacy and security. Measuring individuals' self-efficacy on security and privacy will help understand how users within a community view themselves and whether having a higher (or lower) overall score will relate to other variables of interest. The scale will be used in relation to the composite score of the individual taking the survey compared to the composite score of their close contacts. The community efficacy scale is used in our framework to measure participants' sense of belonging independent of privacy and security, it stands to reason that a participant with low community efficacy due to a lack of a sense of belonging to the community, would not feel strongly about the communities' collective capacity to address privacy and security together. I will draw results from data analyses on power users to understand how the presence of power users within a community affect communities' overall community collective efficacy score. Sundar created a scale [19] which is used to describing proactive technology users who are more likely to explore all possible customizations with their technology, giving an outlook on the power user factor in the study.

4.3 Conclusion

Tech caregivers and Tech caregivees have a close correspondence to each other and through the study it can be deduced that decisions are impacted by some percentage because of the views and knowledge shared by the tech caregiver. All the survey responses and discussed concepts in the paper can be taken into account to design a mobile application in the future for knowledge exchange that will serve as a helping tool for guidance. I am interested in understanding the dynamics of

social networks that can benefit from community oversight to explore the design ideas curated as a viable solution to organize transparency, awareness, and participation in these networks

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