

Privacy on Social Networking Sites Among Canadian Teenagers

by

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The following individuals certify that they have read, and recommend to the Faculty of Graduate and Postdoctoral Studies for acceptance, the thesis entitled:

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Abstract

The widespread popularity of social networking sites (SNSs) among teenagers continually raises concerns over their safety among parents, educators, and policy makers. Although a teen's use of such platforms plays a vital role in his or her social development, such online activities lead to a plethora of personal information being shared that increases vulnerability to privacy invasion and information misuse.

The employed monitoring, restriction and educational methods of privacy protection have been unsuccessful in encouraging teens to stay private on SNSs. While researchers have investigated online practices of teens, we lack a clear understanding of the rationales behind their safety and confidence on SNSs. Additionally, with the rapid emergence of new social networking applications each year and the ongoing evolution of educational school programs on privacy, a teen's notion of privacy and online behaviours are constantly evolving. As a result, a thorough exploration of online interactions and thought processes of teens can help us better understand them and consequently communicate with them.

This thesis explores the perception of online privacy by Canadian teenagers (15-17 year olds) as well as their privacy-related concerns and behaviours on SNSs. To this end, semi-structured interviews were conducted with high school students ($N = 20$), and an online survey was completed by a more diverse pool of participants ($N = 94$).

Based on our results, we grounded a theory that highlights our participants' broad definition of online privacy which directly relates to their online privacy concerns. These concerns shape their decision-making processes about information disclosure. Our theory highlights our participants' frequently used rationales for feeling safe online, the variety of protective measures used to address their privacy concerns, and the factors that influence their choice of SNSs. Our findings can help parents and educators gain a better understanding of a teen's perception of online privacy and interactions on SNSs. Additionally, our findings can inform the creation of better suited policies, educational approaches, and parental supervision techniques for teens.

Lay Summary

This thesis explores the perception of online privacy by Canadian teenagers (15-17 year olds) as well as their privacy-related concerns and behaviours on Social Networking Sites (SNSs). To this end, semi-structured interviews were conducted with high school students ($N = 20$), and an online survey was completed by a more diverse pool of participants ($N = 94$).

Based on our results, we grounded a theory that highlights our participants' broad definition of online privacy which directly relates to their online privacy concerns. These concerns shape their decision-making processes about information disclosure. Our theory highlights our participants' frequently used rationales for feeling safe online, the variety of protective measures used to address their privacy concerns, and the factors that influence their choice of SNSs. Our findings can help parents and educators gain a better understanding of a teen's perception of online privacy and interactions on SNSs. Additionally, our findings can inform the creation of better suited policies, educational approaches, and parental supervision techniques for teens.

Preface

This thesis presents research performed by Salma Haghghat-Kashani.

- The Introduction chapter was written by Salma Haghghat-Kashani based on suggestions by her supervisors, Konstantin Beznosov and Matei Ripeanu.
- Chapter 2 was written by Salma Haghghat-Kashani with feedback and suggestions by Konstantin Beznosov, Matei Ripeanu and Jennifer Shapka.
- Chapter 3 was written by Salma Haghghat-Kashani with feedback and suggestions by Konstantin Beznosov, Matei Ripeanu and Jennifer Shapka. The research was designed by Salma Haghghat-Kashani based on their feedback. The study interviews were conducted and transcribed with the help of Rachel Baitz.
- Chapter 4 was written by Salma Haghghat-Kashani with feedback and suggestions by Konstantin Beznosov, Matei Ripeanu and Jennifer Shapka. The online survey was designed and the results were analyzed by Salma Haghghat-Kashani
- Chapter 5 was written by Salma Haghghat-Kashani with feedback and suggestions by Konstantin Beznosov, Matei Ripeanu and Jennifer Shapka.
- Chapter 6 was written by Salma Haghghat-Kashani with feedback and suggestions by Konstantin Beznosov, Matei Ripeanu and Jennifer Shapka.

Our exploratory study was approved by UBC Behavioural Research Ethics Board (BREB number H15-00562), under the title of “Adolescent Understanding of Privacy in a Technology-Filled World”.

Our confirmatory study was approved by UBC Behavioural Research Ethics Board (BREB number H17-00785), under the title of “Understanding Influential Factors on Teenagers’ Online Concerns.”

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*To my beloved parents, Fahimeh and Ahmad,
and my dear brother Ali.*

Chapter 1

Introduction

The overwhelming majority (99%) of Canadian students aged 9-17, and of American teens (97%) aged 13-17 are online and have access to a mobile device [2, 3]. Of those Canadian students, 57% reported Facebook as their favourite website. More than 40% indicated some social networking related activities, such as posting content and following friends, as their most frequent online activities [2]. Social networking sites (SNSs) are an integral part of teens' online world [3] and provide a way to satisfy their developing social needs [4] by allowing them to explore different social roles, form identities, and express themselves [5]. Most teens feel supported and more connected to their peers because of SNSs [6]. Unfortunately, research has shown that there are risks associated with sharing personal information online via SNSs [7, 8]. Cyberbullying is a common outcome, and can lead to depression, anxiety, or even suicide [9–12]. Other risks include being exposed to online predators, harassment, sexual solicitation, or exposure to financial and identity fraud [13–15].

Additionally, it is well known that compared to adults, risk-taking behaviours, such as reckless driving and binge drinking are more prevalent among teens [16, 17]. Due to their evolutionary characteristics such as being trusting and naive, and since they tend to ignore long-term outcomes, teens are most vulnerable to risks [18, 19]. It has also found that availability of immediate feedback, and being in circumstances that increase

reward system activation, such as the presence of peers, increase teens' engagement in risky behaviours [20]. Indeed, such conditions are met when teens engage in SNSs.

1.1 Understanding Teens

At a policy level, privacy policies fail to take into account teens' perception of their online privacy. For instance, the Personal Information Protection and Electronic Documents Act (PIPEDA) assumes that transparency regarding data collection will encourage users to withhold private information [21], and SNSs tend to follow privacy models that focus on users' personal control over information. These models are inconsistent with teenagers' online practices, which focus on the importance of shared social norms such as trust to regulate privacy [22]. This facilitates commercial and even malicious data collection. For instance, Felt and Evans have reported that third parties on Facebook can verify the identity a single user, even without having their names [23]. As a result, the potential to exploit shared information increases, which in turn puts teens at more risk.

While these studies all shed some light on teens' perception of privacy; their view on their information disclosure behaviour and their perception of their safety still remains an open problem. Previous research suggested that teens' frequent disclosure of personal information is due to a lack of concern for privacy [24, 25]. However, recent work indicates that teens are as aware of and concerned about the confidentiality of their information [26–29] and there is little variation between youth and adults' privacy concerns [30, 31]. This dichotomy between information disclosure and privacy concerns is a continuing topic of research. Many hypotheses have been postulated to explain this dichotomy, for example: social pressure [32, 33], a unique balance between perceived risks and rewards [34, 35], or because teens seek privacy differently by exercising control over other people's access to their information [22, 36].

1.2 Protecting Teens Against Harm

Teenagers do not get much relevant guidance to engage in good privacy practices. Educators at schools use ineffective techniques to influence teens' online behaviours, such as negatively framing the use of SNSs and using "scare tactics" [29, 37]. Additionally, parents often rely on top-down practices, such as placing strict limits on technology use or by using online safety apps (that are designed to support parental authority [38]) to control and monitor their teens' online activities. Although methods used in prevention campaigns and interventions lead to an increase of safety knowledge, teens' online behaviours remain largely unchanged [39]. Unfortunately, these parenting practices tend to undermine teens' growing need for autonomy and privacy, and often lead to teenagers engaging in high risk behaviour as they begin to hide their online activities from their parents.

In order to encourage and empower teens to be active agents in protecting themselves online, it is necessary to understand their perception of privacy as well as the factors that influence their risk level in online interactions. Hence, it is necessary to further explore teens' use of SNSs and their thought processes to provide an accurate narrative from their perspective.

1.3 Contributions

In this work, we seek a better understanding of the factors that influence teens' online decision-making processes regarding privacy. To this end, we first conducted semi-structured interviews with 20 Canadian high school students, aged 15-17, with the goal of investigating the concerns and rationale behind their actions. We followed a grounded theory methodology, analyzed the data by performing open coding, axial coding, and selective coding to better understand and characterize teens' online behaviours and concerns. To confirm our findings with a more representative sample, we then conducted an online survey with 94 Canadian teens.

The main contribution of this research is a better understanding of teens' notions of online privacy, concerns and decision-making processes on information disclosure. Our specific contributions are as follows:

- We confirm previous findings on teens' views of online privacy, and identify additional aspects that suggest teens have a broader definition of privacy compared to adults.
- We expand on the main aspects of teens' online concerns and determine that social status concerns are directly related to teens' online decision-making processes.
- We identify the types of information teens perceive as more private.
- We provide a comprehensive list of protective tactics that teens employ and identify the most popular tactics.
- We determine that the choice of SNS is often a protective tactic used by teens and we expand the list of factors that influence this decision.
- We identify major rationales that influence teens' lack of privacy concerns and provide deeper insight regarding their online behaviours.

1.4 Organization of the Thesis

This thesis includes exploratory and confirmatory studies. We provide an overview of the background and the related work in chapter 2. In chapter 3, we present our exploratory study, including methodology, data analysis, results, and discussion. In chapter 4, we discuss our confirmatory study and present the study's methodology, data analysis, and results. In chapter 5, we discuss our main findings, the implications, and the limitations of our studies. Lastly, we summarize the main conclusions in chapter 6.

Chapter 2

Background and Related Work

To better understand teens' use of SNSs, this section provides an overview on social development processes that influence teens' actions, the role of major SNSs on teens' lives, as well as relevant literature on teens' privacy definitions, concerns, and their current privacy management techniques.

2.1 Social Development and Parental Influence

Cognitive, psycho-social, and emotional developments in adolescence mark the transition from childhood to adulthood. In early adolescence (ages 11-14), teens begin to define their personal spaces by creating stronger physical boundaries such as closing doors and enforcing privacy rules such as knocking [40]. Early adolescence is also the time during which the complexity of teens' conception of privacy crystallizes [41]. In later years (14-17), adolescents focus on self-identity and start seeking independence from parents and other family members [41, 42]. At this stage, teens may distance themselves from parents by not talking to them or withholding information [43]. As a result, various parental monitoring techniques are used to supervise teens' day-to-day activities. Techniques that involve "*attention to and tracking of the child's whereabouts, activities, and adaptations*" [44, p.61] are associated with reduced risky behaviour in teens [45]. Hence setting up rules and monitoring

where teens go and with whom they hang out are common practices. In the current digital age, more than 60% of American parents claim to have checked the websites their teen visits along with their social networking profiles [46]. Less than half of parents have looked at their teens' calls and text messages. Parents have also used parental control software to block, monitor, and filter their teens' online activities (39%) [46, 47]. However, such technical restrictions have no significant effect on protecting teens against online risks [47, 48]. Although direct intervention by parents may reduce teens' exposure to online risks, it also affects their ability to interact online and effectively cope with risks [49]. At the same time, active mediation by parents such as talking to teens about their online activities has been found to have a positive influence on reducing problematic online behaviours [39, 49, 50]. A majority of parents also prefer non-technical approaches to privacy, such as rule-making and co-use. For instance, more than 90% of parents have talked with their teen about sharing and viewing (in)appropriate content online [46]. Despite these efforts, teens continue to participate in social networking activities that put them at risk.

By distancing themselves from parents, adolescents seek social support from peers and begin to disclose personal matters with friends [51]. They seek their friends' insight, connection, and validation instead of parents. This results in having their social relations becoming paramount in their lives. During this time, adolescents become members of peer groups to explore their interests and form their identity [52]. Additionally, the development of abstract and operational thinking enables teens to think about the consequences of their actions and understand the causes and effects related to their behaviours. Such thinking also results in the creation of an imaginary audience (usually their peers), that is considered to be observing and thinking about the teen [53]. Lastly, it allows them to think about their feelings and how they are perceived by others.

2.2 Teens on SNSs

Teens in particular have been early adopters of SNSs. About 71% of US teens aged 13 to 17 have Facebook accounts, 52% are on Instagram, and 41% are on Snapchat [54]. Comparatively, 85% of Canadian teens in grades 7 to 11 have Facebook accounts, and

42% have Instagram accounts [2]. In 2016, it was estimated that 80% of teenagers with mobile devices use Snapchat [55]. SNSs such as Facebook, Instagram, and Snapchat, make communication and interaction effortless. Facebook enables users to stay connected and share text, photos, and news with others. The photo sharing app, Instagram, encourages users to share photos and videos publicly or privately. Snapchat facilitates communications via what is perceived as “self-deleting” photos and videos. Each platform supports various types of activities and serves a range of communication and social needs. For instance, Facebook gratifies one’s need to have fun, and know about their friends’ lives [56]. On the other hand, instant messaging is more about maintaining and developing relationships [56].

Social networking is among teens’ most popular activities online. This potentially increases their vulnerability to online risks. Teens use SNS to message friends, comment, post content, and follow others’ activities. They participate in social media by sharing their personal opinions [31]. They form their online identities and showcase their offline experiences [31]. SNSs allows teens to create a reputation online and manage their social status through monitoring their received “likes” and comments [5, 31, 57]. During this process, teens often overshare personal information in order to develop and maintain relationships [34]. Although they are aware of the consequences of their online behaviours [34], inevitably, they share a considerable amount of personal information on SNSs. In 2013, Madden et al. [31] reported that an overwhelming majority (90%) of teens post their real name and personal photos online. They found that more than 50% of teens share their school name, the town they live in, and their email address, while 20% share their cell phone number. This should not be surprising, since Facebook’s “terms of service” ask users to provide accurate personal and contact information [58]. As noted, such disclosure of information increases teens’ vulnerability to online risks [11, 59].

Some studies have argued that teens’ disclosure of personal information is an indicator for their lack of privacy concerns [60–63, p.51]. Sithira and Nguwi [24] have reported that teens are not cautious while online: they are comfortable with sharing offensive views and they feel comfortable with e-banking or downloading online materials. A study of 7,000 college students revealed that although students were concerned about personal information such as passwords and social security number, they considered SNSs as “private” spaces

and were not concerned about sharing personal content [64]. Past work has also shown that teens use a "risk-benefit" approach to privacy. In a study with 326 high school students, Youn [65, 66] found that higher perceived benefits of information disclosure result in more willingness to share. However, other studies with college students found no such correlation [27, 33]. Tufekci [33] claimed students care about their privacy and use privacy settings and nicknames to manage access to their information. Additionally, focusing on older teens (ages 18-19), Agosto et al. [37] found that older teens are less concerned about their online safety since they believe they are capable of protecting themselves. Given these varied views on teens' privacy concerns, it is important to gain more insight on teens' use of SNSs and their notion of online privacy to better protect them against possible harm.

2.3 Privacy Definitions, Concerns, and Management.

2.3.1 Definitions

Privacy is a social construct and people's conceptualization of privacy varies. Westin [67] (1968) defined privacy as "*the claim of individuals, groups, or institutions to determine for themselves when, how, and to what extent information about them is communicated to others.*" One of the states of individual privacy identified by Westin is "reserve", which is the most applicable state to today's information privacy. Taking place in public, it is the desire to limit information disclosure to others while such desire is being recognized and respected by them [67, 68]. Altman (1975) defined privacy as "*the selective control of access to the self*" [68]. In both theories, privacy is described as culturally-specific. Hence, people's attitudes toward privacy vary depending on their social norms, values, and practices. In a similar approach, Nissenbaum [69] explained contextual integrity as a core aspect of privacy. She identified that the subject of the data, type of information, sender, recipient, and how information is transmitted are critical parameters that control privacy [69].

In the context of online social networking, adults' definitions of privacy have been investigated by a number of studies to demonstrate its importance in their lives. As examined

by boyd on privacy concerns of adult Facebook users, privacy is about the sense of control over the information, context, and audience [70]. In another study on 19 graduate and undergraduate students, Dwyer highlighted the “impression management” efforts that users put to present a good impression of themselves to the audience [71]. Dwyer findings suggested that users viewed their online content as public, and believed they were responsible to control the availability of their information and the image they portray [71]. In a study on privacy and technology, Kwasny et al. [72] reported that younger adults’ definition of privacy is consistent with Westin’s “reserve” state, as it involves ideas of controlling their information and disclosure or non-disclosure decisions (e.g., whether to share the information or keep it to themselves). However, older adults have a narrower conceptualization of privacy which focuses on “*something official that they are given: a legal document, health information, their social security number, or a secret that a friend confides in them*” [72].

Studies on teens’ privacy perceptions in online context have revealed that a majority define privacy in terms of both their audience and access to their information [28, 29]. Boyd and Marwick [28] suggest that teens’ approaches to privacy are not simply about disclosure or nondisclosure of information. Teens want to participate in SNSs, but they only want to be visible to certain people [28]. Hence, they seek to regulate the boundaries between private and public by deciding on what information to share and what to keep to themselves [5, 28]. Marwick and boyd [22] add that teens also perceive privacy as the ability to control the image they portray to others. Teens place a significant emphasis on social norms such as trust and respect when speaking of privacy [22].

2.3.2 Concerns and Management

A majority of adult American Internet users are concerned about strangers accessing their personal information (84%) and computer hackers accessing their credit card numbers (50%) [73]. A similar study by Krasnova and Kift on adult German Facebook users highlighted that they are more concerned about the misuse of their personal information such as name, address, phone number, and photos compared to bank data and passwords [74]. Users believe that they should know all about their available information on the websites, and that a law should be in place to have websites delete personal information [30].

Other privacy-related concerns include having personal information shared with third parties, identity theft, and (prospective) employers gaining access to nonprofessional online activities [75].

Compared to studies on adults, it has often been suggested that teens are not concerned about their online privacy. For instance, it has been found that compared to their parents, teens are less worried about online data collection by marketers [76]. Additionally, it has been reported that teens do not utilize the privacy customization features provided by the SNS [71]. In a study on teens' attitudes toward privacy by Lejnieks [77], teens are asked if they are concerned about online "privacy and security" issues. More than 60% of them have claimed that they do not care [77]. Additionally, Sithira and Nguwi [24] reported that many teens do not secure and protect their private information on SNSs. Another study on young adults indicated that they are less concerned about portraying a professional image on SNSs [78].

Recent studies on teens' online behaviour, however, have indicated that teens are concerned about their privacy and they take steps to protect themselves [29, 59, 79].

Tufekci [33] reported that instead of nondisclosure, college students' concerns over unwanted audience lead them to adjust their profile visibility and use nicknames. (Note that even when their profile is set to private, teens still share personal content with up to hundreds friends that they know casually on SNSs [5].) Teens also use additional techniques to manage their privacy. They delete friends from their accounts, share false information and "cloak" their messages so that only certain friends can understand them, un-tag names from photos, delete friends' comments from the accounts, and delete/edit their shared content [31, 76].

While researchers have investigated teens' online practices, there is no clear understanding of the rationale behind teens' confidence in their safety on SNSs. With this wide range of online activities and concerns, it is necessary to obtain a more comprehensive understanding of how teens use SNSs, what they worry about online, and how their concerns influence their decision-making processes on information disclosure in order to better protect them against online privacy violations. Given that the employed monitoring, restriction, and educational methods of protections have not been successful in encouraging teens to stay

safe and private on SNSs, such insights can help parents and educators to develop new strategies to address teens' online privacy issues.

Chapter 3

Exploratory Study

To understand teen’s perception of privacy, we chose to focus on their individual experiences using the Grounded Theory (GT) approach. First articulated by Glaser and Strauss [80] and later modified by Corbin and Strauss [81], GT is a qualitative research method with the primary purpose of constructing theories from data. In this thesis, we used analytical tools such as constant comparisons, theoretical comparisons, the “flip-flop” technique, waving a red flag technique [81], and clustering [82] to analyze our data. To this end, we conducted in-depth semi-structured interviews to explore participants’ self-reported online behaviours and their decision-making processes. Using in-person interviews allowed us to clarify given responses, ask follow-up questions and deviate when new topics emerged.

We conducted three rounds of interviews over a year and a half. Each round was followed by an analysis process. The first round was in the Summer of 2015 from July to August, with 11 participants. The second and third rounds were conducted in June to August 2016, and in January 2017, with five and four teens respectively. On average, each interview lasted about 45 minutes. They were all audio recorded and transcribed for analysis.

TABLE 3.1: Participants' demographic information.

Gender		Live With	
Female	60%	Both Parents	70%
Male	35%	Mother	20%
Transgender	5%	Father	10%
Age		Parent Education	
Grade 10th	20%	Post secondary	55%
Grade 11th	20%	Bachelor	35%
Grade 12th	60%	Some college	10%

3.1 Sampling and Participants Recruitment

We used criterion sampling to recruit 20 teens aged 14 to 17 (13 females; see Table 3.1). This age range was chosen as it represents a period when adolescents' independent functioning from their parents increases [53]. Developmentally, they are focused on friendships and intimacy, hence, privacy becomes a more relevant concern. Since Facebook was at the time the dominant SNS among teens [54], participants were targeted through Facebook ads.

All participants signed a consent form and received \$10 as compensation. Our study was approved by the university's research ethics board (approval # H15-00562).

3.2 Data Collection

Before starting the interviews, participants were asked to complete a questionnaire that collected their demographic information (including age, living arrangements, e.g., living with one parent or both, parent's education level), as well as general information about access to and use of SNSs (Appendix A.1). The interviews were then conducted in a flexible manner with the help of an interview guide which included sections on teens' use of digital devices, use of SNSs, and online privacy practices. This guide was reviewed by Dr. Jennifer Shapka, an expert from the Department of Educational and Counselling Psychology, and

Special Education at University of British Columbia to ensure that the questions addressed the study objectively and without bias among the participants. Interviews were carried out in a conversational style. We developed the interview guide to help us carry out discussions with teens in a conversational style. The first round of the interviews broadly covered topics such as teens' ideas of privacy, their online experiences and interactions, their experience creating their accounts, and their advice for others. We specifically probed for recent and personal experiences to help them uncover the rationale behind their actions. Throughout the following academic year, we transcribed and performed a preliminary analysis of the data. Based on the results of the analysis, the second round of the interviews was conducted to further focus on teens' concerns, their privacy settings, and other safety measures they take to stay private. Participants were always asked the follow-up "why" question to elaborate their privacy attitudes and decisions. The third round of interviews aimed to delve deeper into their use of different SNSs and their perception of privacy and safety associated with each platform (Appendix [A.2](#)).

3.3 Analysis

The coding process was performed after each round of interviews. After the 20th interview, no new codes appeared during the data analysis, indicating that saturation had been reached (Figure [3.1](#)). As suggested by Marshal and Rossman, our coding process included breaking down the data into manageable pieces, interpreting the data, and assigning conceptual labels (codes) to the pieces of text to best describe what we believed was indicated by the data [[82](#)]. Memoing was done throughout the analysis process to describe the codes, our interpretations, and the relationship between codes.

We started the preliminary analysis process after the first round of interviews in order to refocus the questions based on the emerging content. We began with the initial open coding [[82](#)], during which we looked at every sentence to identify and label the essence of the statements. As a result, we generated a long list of 300 codes for the first 11 interviews. During the axial coding [[82](#)], we reviewed and grouped the initial codes around common conceptual categories. About 21 categories emerged through this process. Similarly, the

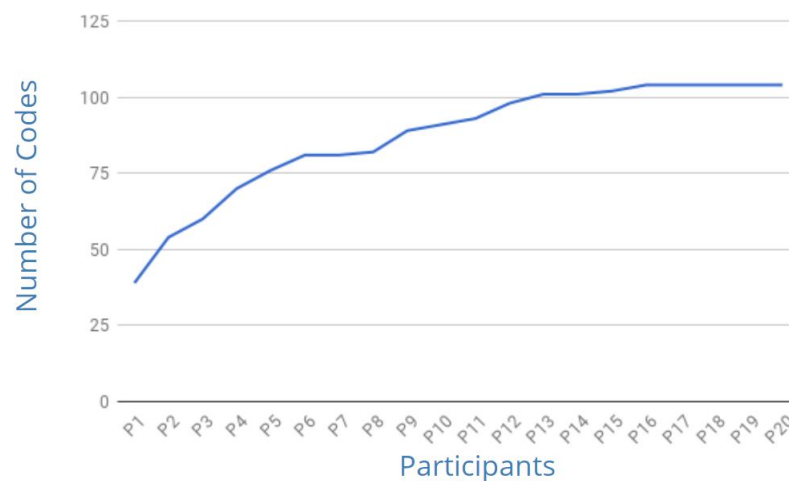
open coding and axial coding processes were performed on the new interviews. When new topics were discussed, new codes were generated. When similar topics were mentioned, they were labeled with the existing codes to further develop and refine the existing categories.

Through selective coding, we identified the core category and sub-categories. The remaining categories were used to expand on those. We further analyzed the transcripts by looking for themes that related to teens' online concerns to develop a model that characterized their privacy perception. We compared the description of our model with the data to identify the model's accuracy and we updated the model iteratively until we felt confident that the model correctly represented teens' view on privacy.

3.4 Results

We identified teens' online concerns as the core category of our findings, and their conceptualization of privacy, perception of safety, and protective measures as the sub-categories. In what follows, we explain each category in more detail, and provide illustrative quotes from interviews.

FIGURE 3.1: Interview data analysis codes saturation.



Since the purpose of this qualitative study was exploration of a phenomenon, we avoid quantitative statistics in the reporting of the analysis results. Instead, we highlight a full range of answers and points of view.

3.4.1 Perception of Privacy

To confirm previous studies on teens' definition of privacy, we asked participants to describe privacy in their own terms and to provide examples of what they perceive as a privacy invasion.

The majority of the participants highlighted the importance of having the ability to control who can observe or access their shared content. Their descriptions focused on the ability to choose either the information they would like to share, their audience, or both. For instance, P1 define privacy as *"the amount of control [she has] over who sees [her] information and who doesn't."* P6 also stated: *"Privacy is how much you choose to share, don't choose to share; with whom you choose to share or whom you don't choose to share with."* She further added that privacy is also about how much information other people share about her. P9 was more specific with his description. He explained privacy as the ability *"to put stuff on the internet that only the people [he has] on [his] friends list can see."*

P14 focused on the importance of consent. She stated: *"privacy is making sure that the information that you shared is not shared to other people without your consent. Like, I guess that if I'm talking to someone, or if I share a photo, I think that the photo that I shared on that website should stay on that website. But if it's saved by other people and spread on other websites then it would feel to me as an invasion of my privacy."* Similarly, P19 described invasion of his privacy as someone accessing information that he had not provided to them.

From a slightly different perspective, few participants focused on traceability. For instance, P4 stated that privacy is *"to do something without other people knowing and/or interfering."* He gave an example and explained that it is *"being able to browse different web pages and being able to say things online without other people being able to, like, track you down"*

or look at all your other history and stuff.” For P17, privacy was also about the ability “to do something without somebody else knowing it.”

3.4.2 Online Concerns

To shed light on teens’ concerns when using SNSs, we asked them about their privacy concerns and their thought process when posting online content. Their responses fell into two general themes: *social status* and *security* concerns.

Social Status Concerns

The majority of our participants were concerned about their social status and how their posts would be perceived by the audience. This includes concerns over the audience’s interests and judgements. Almost all of the participants made comments such as “*I think about who’s gonna see*” the post, or “*who is my audience?*”

For instance, P4 stated: “*So I find my biggest concern is that have people read my post or find it interesting?*”. Thinking thoroughly about the audience’s judgements, P6 stated: “*I like to think about how different people in my friends list would see this [post]. Like how would I feel if my friend saw this, my best friend, my mom, my distant relative. Like what would they feel about me posting this?*” P1 mentioned asking herself “*is [this post or picture] going to portray a good image of me to a stranger who doesn’t know me?*” She further explained: “*Because people who don’t know you and they are more likely to judge you based on a post or a picture than my friend who knows me and might know why I posted that picture, or if that wasn’t like me. But I think [to myself]: does this show strangers what I’m actually like?*” Similarly, P8 expressed her concerns about future employers: “*...if you have an employer in a year or two, he can go on your Facebook, he can see the things you did. If you go to a strip bar do you want to post pictures of that?*” Additionally, some participants worried about their friends posting content about them that could damage their social status: “*I guess my biggest concern is if other people post pictures of me. Like for example with alcohol in my hand, that would be my biggest concern*” (P1).

Another common statement involved participant’s attention to not offending their audience. P7 explained: “*Well, I don’t think I’m a very offensive person, I hope not at least, and*

I don't say offensive things. But, as I said, without the benefit of the body language and like intonation, sometimes things can be taken in the wrong way and so I wanna be careful that everything I say does not come across in any way as something that would be deemed offensive to anybody."

To further explore teens' concerns on SNSs, we asked our participants about their online regrets. We identified that they also regret actions that negatively influence their social status. They regret sharing "stupid" posts, "ugly" pictures, or in general embarrassing content. For instance, P6 stated: *"I posted like stupid things. They are not like important... it is just stupid things that I shouldn't have said or done."* Additionally, similar to their concerns about offending others, they expressed regrets about sending rude messages or comments. For instance, P7 mentioned: *"Sometimes I just say something kind of offhand if I'm in like kind of a bad mood. Not anything like offensive but it can come off kind of rude and I'll be like oh sorry I didn't mean to be rude, I haven't had any sleep and I don't know what I'm saying, that kind of thing."*

Security Concerns

These concerns were mainly about unauthorized access to teens' data such as financial information, passwords, and social insurance number. It also involved concerns over hackers, identity thieves, online predators, and stalkers. For instance, some participants worried about *"people figuring out [their] passwords and leaking them to other people"* (P13). P14 mentioned that *"... it's just scary if they were to figure out what your password is or somehow reset it. They have access to everything you put on there, cause there's like a large part of myself that goes into social media."* Similarly, P5 was concerned about online predators. She reasoned, *"because I know that a lot of my friends kind of talk to these guys that say they're however old and they have their profile picture to some young attractive guy, but no. Like there's more to it, I guess. You can't really trust that."*

3.4.3 Feeling Safe

Although teens expressed having concerns when using SNSs, they felt confident that they are safe online and they claimed to share a great deal of information online. To better understand teens' information disclosure behaviours, we asked participants to explain their perceived safety threats, whether or not they feel safe on SNSs, and the reasons why. Participants' generally associated safety with the absence of physical, mental, and emotional harm. For instance, P19 defined safety as *“not getting killed or hurt.”* P14 explained that safety to her is *“not being attacked and not being interfered with, in harmful ways.”* P16 explained that safety is *“to be able to do something without having any mental or physical or emotional harm being done to you.”* He further explained that in online situations, *“if somebody else sees [the information you do not wish them to see], it would have an emotional effect on you.”*

Information safety was mentioned by some participants. Some equated safety to not getting hacked or having strangers obtain their personal information. For instance, P20 stated that online safety is *“people not knowing [his] personal information like where [he] lives, what [he does], where [he] often hangs out, and stuff like that. Because if strangers know that, that would be very creepy.”* Others claimed that feeling safe is about feeling comfortable, secure, and in control of their situations. P13 defined not feeling safe as the inconvenience of dealing with problems. She explained that *“it's very unnecessary and time consuming if I were to face an online problem, for example a security one. For example, I don't want to not have access to my emails because I was hacked. Then I wouldn't get the important emails that I usually get from organizations and things.”* Additionally, our participants included unauthorized access to information, re-sharing content without permission, online predators, and bullying into their understanding of safety threats.

The majority of participants indicated feeling safe on SNSs. We noticed five major themes in their rationales for feeling safe: (1) Some reasoned that since they take the necessary precautions, they are safe online. The precaution methods varied (will discuss them further in the next section). For instance, P5 mentioned *“I conceal information [online]... I have like a million of friend requests from people who I have no idea who they are, and obviously, I'm not gonna accept that just for safety reasons.”* (2) Some perceived themselves capable

of dealing with the consequences of a safety breach. For instance, P9 mentioned that if a stranger with a fake account messages him, he would delete the person from their social networking account. In explaining why she shares her phone number online, P13 stated that *“because [she] can easily change it”*. Similarly, P17 claimed that she would never share her social insurance number online. She stated: *“I don’t have a lot of knowledge on social insurance, how the government works with that, and how easy it is to take information from me and steal my identity. Because I don’t know a lot about it, I don’t want to dip my toe into it.”* (3) Some other participants viewed it as unlikely to have their safety threatened or get harmed online. For instance, P12 stated: *“well, because you hear about the dangers and stuff but then it’s not really, like it could never happen to me right? It would never happen to me.”* P17 reasoned that not a lot of things have ever happened to her online, and P18 stated he does not think anyone is going to kill him. (4) Some participants believed that they have nothing to hide or no content that would create troubles for them. In particular, participants mentioned *“being open”* about their lives (P7, P17), and not having sensitive or important content online (P4, P12, P13). For instance, P4 mentioned *“I don’t think I have anything important enough worth spying or hiding I guess. As it stands right now, I don’t have a lot of reason to be really secretive.”* Similarly, P7 stated *“most of the socializing I do is through the messages, so one to one. I guess in theory people could hack into that, but I don’t see why they would. Nothing I say is very that interesting. There is nothing terribly secretive in my life. If I was like a spy maybe I’d be little more concerned, but my life is pretty much an open book.”* Lastly, (5) some participants claimed to not be concerned about privacy invasions that have no direct effect on their lives. For instance, P16 stated that *“if people have problems with Facebook seeing what you search or something, I think that’s just fine. That’s what they’re supposed to do. It’s their job but like for somebody I know to look at something I do without my consent, I’d consider that as an invasion of privacy.”* He reasoned that *“[accessing his information] is very unlikely to have any direct effect on [his] life”*.

Only a few participants answered “no” to the question of whether or not they feel safe on SNSs, due to potential threats to their physical safety, or/and emotional safety. Focusing on her physical safety, P8 mentioned feeling unsafe while she was having a stalker a few years ago. Highlighting the information safety, P6 believed that no one is ever safe. Although

she uses privacy settings, she reasoned: *“but I know that it’s still possible that like when I post things, people can still get to them.”* From slightly a different perspective, P19 stated that she used to feel safe online before having some relatives “following” her on Instagram. She stated: *“I really don’t like it. I used to feel very safe on Instagram because I could be myself. I could be anyone I wanted to but now I just keep thinking about what [my relatives] going to see.”*

Protective Measures

We identified seven actions participants take addressing their online concerns. These actions are labelled (1)..(7) below:

(1) Withholding information was the major protective measure taken by the majority of participants. They claimed that in order to make sure they are being private online, they avoid sharing “too much” or “personal” information. For instance, P5 stated that *“important stuff like your address or anything like social security number, obviously you’re not going to want to give that out.”* However, the content that is believed to be private varies among participants. For instance, some claimed that they would never share their addresses, passwords, social insurance numbers, credit card information, and phone numbers online, while others refrained from posting status updates, song lyrics, swear words, and “stupid” or “crazy” photos of themselves. Some cited nude or inappropriate photos of them smoking or drinking, offensive comments, romantic crushes, and their friends’ secrets as private content that should not be shared online. A few other participants mentioned sharing personal views and stories, phone numbers and credit/debit card information.

(2) Addressing security related concerns in particular, some participants acknowledged being careful with their privacy settings. For instance, they set their privacy to “friends only”, disabling the option for others to find them through the Facebook search engine, and disabling the geolocation of their posts. (3) Some limit their contacts with strangers. They identified not adding strangers, and blocking or ignoring their messages as their main tactics. (4) Additionally, our participants claimed using more private modes of communication, such as Facebook direct messaging, texting and calling, for sharing personal matters.

(5) A number of them described asking family members for help on who can see their content.

Consistent with our participants' concern over their social status, (6) they aimed to carefully consider their audience and the consequences of sharing content online. For instance, P4 always asks himself: *"is this something I would be okay with other people seeing?"* He further explained that he reviews his posts to make sure they are not offensive as he has friends, relatives and family members on his social media. Even those participants who had their privacy settings adjusted to "friends only" still considered unintended audiences. For instance P18 stated: *"I'm aware that if I share something, the person I intended to see may not be the only one to see it."* Our participants also considered future universities, employers, and whether they will regret their posts in future. (7) Lastly, some mentioned having two different accounts on one SNS for a variety of reasons. One participant, for example, used a public account for her work with kids at a summer camp, and a separate private account for sharing her personal content. Interestingly, one participant used to have a separate Facebook account for sharing content with his friends. Then, he realized that having his family on Facebook is beneficial. He said: *"I feel like sometimes I might do something stupid and it might make me think. Like I'm about to post and in the back of my mind, it's like your parents will see this. I think it's better."*

3.4.4 Channel Selection

To better learn about online interactions by teens, their unintentional privacy management strategies and other decision-making processes, we asked our participants to describe how they used each SNSs differently.

Facebook

The majority of our participants indicated that Facebook messaging app was a major tool used to directly communicate with their friends and family. Their communications took place in two forms: one-to-one messages and group chats. For instance, P3 and P14 used Facebook to talk to friends who they did not see as often. P1 used Facebook messenger for group chat, instead of texting: *"... I think, if anything, the messenger app would be*

what I use most for Facebook.” P7 explained her use of group chat as follows: *“usually group messaging is easier when you’re trying to plan something with a big group of people, like ‘oh, we should all go to the park tomorrow or something. Then you message a whole bunch of people at once so you could, like, get it up there and everybody would see it. Or if it’s, like, a big group of friends from school, I feel like I just post things and say things that I want all of them to know.”* The second most frequently-mentioned activity on Facebook was following updates on their friends, important events, and news. For instance, P2 stated: *“Facebook is for connecting, kind of seeing what everyone is up to, like, judging them, and, yeah, news. That is the big part of it.”* Participants also shared important news with their network. P5 stated: *“I think the only things I ever post are, like, if there’s, like, big news or something like about the forest fires. I shared an article about that. It was an important thing to me.”* We classified such content as impersonal since they do not reveal much information about the participants. Other examples of impersonal content include sharing articles, cat photos, or funny videos. Participants also shared more personal content on Facebook, such as photos of themselves, their hobbies, beliefs, opinion, and political views. For instance, P8 mentioned: *“sometimes I share quotes that I like which is a lot of what people do. What else. Mainly pictures or, like, pictures with my family and family members.”* P11 reported using Facebook to share her thoughts: *“when I’m posting something, it’s something that irritates me. A topic that I want to bring up, like the last post I did, it was a really racist comment made on a website, and I had to defend it. That’s why I shared it to raise awareness like that.”* Additionally, participants used Facebook for school tasks, volunteering and job related activities. P14 would post on Facebook promotions for the events that she facilitates. P13 and P20 also used Facebook for school projects, contacting their teachers, and looking for volunteering opportunities.

The majority of our participants believed themselves to be less active on Facebook. They made statements that they *“barely ever post,” “don’t post much”* or *“don’t post often”* on Facebook. A reason for not actively posting on Facebook was having there a wider range of “friends” that included their family, close friends, school friends, and acquaintances. P8 described her friends’ range as *“[her] Mom who is 44, with [her] drama teacher who is 60, to [her] friends who are as young as 9 years old.”* She explained: *“with any Facebook*

accounts, you have those people you probably don't talk to, you met them once, they wanted to add you to Facebook and then you kind of drifted away and you actually don't know them. You know them through other friends, but you don't talk to them on the daily basis." Additionally, P11 justified the lack of active posting on Facebook as: "because it documents everything you say."

Snapchat

On the other hand, participants claimed to be more active on Snapchat and share personal content with friends. Such content was believed to be "daily", "mundane", or "stupid" photos of themselves. For instance, P1 and P9 use Snapchat to show their friends what they are doing. P11 also claimed that Snapchat is very personal to her. She stated: "I just send funny stuff over. Like when I'm hanging out with friends and then like upload a photo and then like put it on the story I guess. I'd say Snapchat is more like for personal things." Participants also mentioned sharing "random" content that we classified as impersonal. P7 explained "Snapchat is different because you can send photos and videos with it so if you see something cool you be, like, it reminds me of you." I just send my friends random stuff that I think they will find amusing." Only a few participants with Snapchat accounts stated not using it much. They mentioned using Snapchat to mainly watch their friends' videos and pictures.

Unlike Facebook, the majority of the participants claimed having only their close friends on Snapchat. P1 stated: "I would say Snapchat is mostly just for me and my close friends. I Snapchat them and don't think about what I Snapchat." P11 stated that he trusts his audience. She explained: "Even if [my friends] screenshot and save something that is totally like pretty embarrassing, I'd personally ask them to delete it. Like the next time I hang out with them, I'll ask them to delete it and show me. Like a lot of people that I have on social media accounts such as Snapchat, I trust them." Additionally, our participants' reasoning for why they post more content via Snapchat indicated that they care about the more temporary and casual nature of the platform. For instance, P6 explained: "On Snapchat, it is more likely for me to post something because it seems, like, less permanent. Like, Snapchat is more like a casual thing than Instagram." P17 explained: "It's a lot more casual than Facebook. It's always the connotation that comes with it. It's just like

a trend that everybody is, like, subconsciously aware of it. Any day you want to send a picture, you send it through Snapchat.”

Instagram

Our participants engaged in a variety of activities on Instagram ranging from sharing personal and impersonal content, following updates, and for job-related purposes. The majority of those participants who used Instagram claimed that they use it to showcase their lifestyle. For instance P5 explained: *“with Instagram, I generally just like to post photos of what I’m doing, what I’m eating, you know, like just things I enjoy.”* P15’s Instagram account was more personal to her than her Facebook account. She reasoned: *“I guess on Instagram, people can see what I go through, see my life experiences, who I’m friends with, and what kind of stuff I do in my life.”* Additionally, some participants mentioned sharing impersonal photos such as street arts, sculptures, architecture, or sunsets.

Some stated using Instagram mainly to follow their friends’ activities, along with their favourite actors/actresses. They stated that *“Instagram is more for seeing what other people are doing”, “what people are posting”, “see what everyone is up to”,* and follow fan pages or popular accounts. A few participants have public Instagram pages to showcase their artistic abilities such as photography. A few participants claimed not using Instagram as much.

Lastly, when asked about their followers on Instagram, some participants indicated that they are more likely to accept a stranger’s “follower” request on Instagram, compared to a request on Snapchat and Facebook. For instance, P3 clarified: *“because it’s just pictures, I don’t block people I don’t know, but my page is private on Instagram. I can see who is following me and I can, like, say I don’t want them to follow me.”* P5 explained that she generally accepts all the follower requests on Instagram: *“Just because I feel like there’s less of a risk. Unless someone direct messages me, there’s not really any kind of communication part and it’s easier to block someone on Instagram. They just can’t see your profile anymore.”*

3.5 Discussion

Our exploratory study investigates teens' online decision-making processes by looking at their attitudes towards online privacy and analyzing the relationship between their concerns and online interactions. Our goal is to obtain a more comprehensive understanding of how they use SNSs.

After analysing the data obtained from our interviews, we developed a theory about teens' online privacy concerns and behaviours on SNSs. Our theory states that teens do care about their online privacy and worry about matters on SNSs that directly relate to their perception of online privacy (See Figure 3.2). More specifically, we theorize that teens' major online concerns that include social status and security concerns, shape their decision-making processes about their information disclosure on SNSs. For instance, when posting content online, teens have various justifications to address their online concerns. These justifications range from believing that they have nothing to hide, to believing that they take measures to stay private on SNSs. For instance, such measures include choosing which SNS to use in order to communicate with their friends.

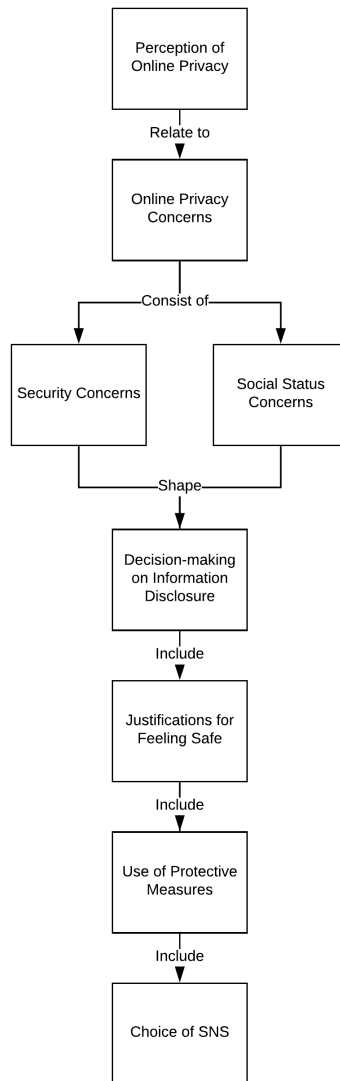
The following sections explain our theory in more detail and summarize the findings that motivate our confirmatory study's research questions (Section 4).

3.5.1 Perception of Privacy

The results of our interviews suggest that our participants' notion of privacy is fairly consistent with the traditional views by Westin and Altman [67, 68] and findings by Kwasny et al. [72] on young adults. Additionally, our results confirm the findings of previous studies on teens' notion of privacy [22, 28, 29, 70]. Our study expands on their conceptualization of privacy and also highlights their view on privacy invasions.

Similar to Marwick and boyd's findings [22], our participants perceived privacy as having the ability to choose which information to share with which audiences. *They focused on controlling the flow of their information by choosing their content and the channels of*

FIGURE 3.2: Our grounded theory on teens' online privacy.



communication. This is also consistent with boyd's assessment [70] of adult Facebook users' view on privacy that focuses on their ability to control "impressions" and social situations. Hence, privacy is about managing the boundaries to access information. Additionally, we found that our participants' definition of privacy was also focused on the ability to control what information their audience share about them. In this respect, *invasion of privacy*

was viewed by our participants as having their information re-shared without their consent. As a consequence, the audience was believed to be responsible for maintaining the teen’s privacy. This is in contrast to Dwyer’s findings on young adults who generally viewed their online content as public [71]. Lastly, our participants’ notion of privacy involved the ability to engage in online activities without having their activity tracked back to them. In our confirmatory survey, we aimed to refine and validate these qualitative findings (see RQ1 and Section 4.2.1).

Although our participants shared a great amount of information on SNSs, they also believed that their “private” information should never be shared online. This is in contrast to the view that teens are unconcerned about the security of their information [24]. However, what was believed to be “private” information varied. Different types of information were associated with different levels of privacy. Similar to Bryce and Fraser [34], we found that disclosure of certain type of information, such as financial or social insurance numbers, was perceived to be too risky. In such cases, the participants saw themselves as active agents, responsible for keeping their information safe. In our confirmatory survey, we measured the perceived privacy level of various types of content (see RQ2 and Section 4.2.2).

3.5.2 Online Concerns

The results of our interviews highlighted the complexity of teens’ thought processes and concerns when interacting online. We were able to provide a comprehensive, although not exhaustive, list of teens’ online privacy concerns that expands previous studies [31, 76, 83, 84]. We identified social status related and security related concerns as the two major topics of concerns among our participants.

Social Status Concerns

Our participants’ major consideration about using SNSs was managing their social status and image. Their concerns were focused on the popularity of their content, and the audience’s perception and judgment of them. This finding is similar to the study with undergraduate students reported by Christofides et al. [27].

Our participants' online regrets further emphasized the importance of their self-image. Similar to adults [30], our participants were concerned about having photos of them uploaded without consent. Additionally, they regretted their earlier posts, excessive amount of sharing, and posting unimportant content. Such regrets were perceived as embarrassing and/or potentially damaging to their social status. Self-image concerns were also highlighted by the description of their thought process when sharing content online. To manage their reputation, our participants evaluated their content carefully to consider the potential consequences of having it shared. This is in contrast to Wang's finding on college students' lack of consideration, which leads them to regret their posts later [85]. Such attention to the matters of social status on SNSs is understandable, since teens use social media to shape their identity, participate in the society, share their social and political views, and increase their social capital and popularity [4, 5, 31]. This is consistent with teens' development of abstract and operational thinking [53], which helps them consider an "imaginary" audience on SNSs that is watching and judging them.

Security Concerns

Consistent with previous studies, we found that our participants were generally concerned about the security aspects of their online interactions, such as unauthorized access to their information, identity theft, online predators, and stalkers. In line with their concerns, we identified that they employ different techniques to maintain the security of their interactions. In addition to setting their profile privacy to "friends only", our participants withheld information, such as addresses and financial information, used private modes of communication, avoided contacts with strangers, and asked for advice to protect themselves against risks. Our finding is partly consistent with the Fox's report on American Internet users' concerns about strangers accessing their information [73]. However, in contrast to studies on adults [30], we found that our participants were less concerned about access to their information by the SNS operators and other online businesses. Some even accepted the SNS operator's access to their content as normal. Additionally, our findings suggest that, unlike adult Facebook users in Germany [74], teens are concerned by the possibility of unauthorized access to their passwords and financial information.

3.5.3 Feeling Safe Rationales

While the majority of existing studies focused on teens' perception of privacy and their interactions online, a few investigated their rationale for feeling safe on SNSs. Such rationales shed light on teens' decision-making processes, and address the dichotomy between information disclosure and concerns. Through our study, we identified five types of explanations for a teen's confidence in their safety on SNSs. These are discussed below and we estimate their prevalence in our confirmatory study (RQ3 and Section 4.2.3).

Three explanations—the *perceived likelihood of being the target of an invasion*, *perceived effects*, and the *sensitivity of their content online*—highlight our participants' lack of complete awareness on possible privacy and security breaches and their potential consequences. The majority of our participants did not believe that they would be targets of privacy breaches. Even when they did, our participants did not consider themselves at risk unless the threat would result in direct emotional and physical harm. They also did not consider their online content “interesting”, important or sensitive enough for “hackers”, government agencies, or others to target. Even if they were targeted, since they do not post “anything bad”, our participants did not anticipate any serious consequences. This suggests that teens may lack awareness on the wide range of privacy breaches that may occur other than being hacked. They may also underestimate both the sensitivity of the information they share online, such as their lifestyle and contact information, and the potential consequences of privacy breaches.

Fourth, teens confidence in feeling safe increases when they see themselves as being capable of dealing with the consequences of privacy invasions. Comments such as “just delete the person” or “change my number” suggest that our participants considered the consequences of their interaction, and, if they found the consequence manageable, they felt safe enough to continue with their actions. This is similar to the findings by Thomas [86].

Lastly, our participants frequently mentioned that they feel safe online because they take the necessary measures to ensure their safety and privacy on SNSs. In our confirmatory survey, we measured the popularity of various protective measures among teens (see RQ4 and Section 4.2.4).

Choice of SNS as a Protective Measure

One of the major protective measures taken by our participants was the choice of the communication channel for sharing their content. This is partly consistent with Dwyer's finding on low switching cost between SNSs that has lessened users' privacy concerns [71]. However, unlike her claim that a switch to another platform suggests that a privacy problem is already encountered, we argue that teens' choices of the communication channel address their privacy concerns in advance, rather than being a recovery measure.

Based on their comments, our participants' decisions on the selected SNS or other channel were directly influenced by the audience of that channel. For instance, they discussed personal matters with a close friend face-to-face or via Facebook messaging. Similarly, depending on the perceived sensitivity of the content, our participants chose between SNSs. Their Facebook accounts hold the largest and the broadest "friend" lists. As a result, the majority of our participants claimed to "barely" being active on Facebook. They mentioned posting impersonal content such as news, quotes, and interesting articles. Additionally, they claimed sharing what is believed to be general information, such as school name, hometown, gender, age and, in some cases, phone numbers. Such information was described as content that can be known to everyone. On the other hand, Snapchat was generally associated with communications with close friends. In addition to the functionality of the app that makes the content disappear, having close friends on Snapchat resulted in our participants feeling comfortable with sending "mundane" and "stupid" content to their friends. As some explained, they trust their friends with the content. Unlike Facebook and Snapchat, Instagram is used to display one's lifestyle. Hence, pictures are selected for display, while the "just pictures" nature of the app, makes it feel safe for teens to share content. In our confirmatory survey, we refined and validated our qualitative findings about the factors that influence the choice of SNS as communication channels (see RQ5 and Section 4.2.5).

Chapter 4

Confirmatory Study

In order to refine and validate our qualitative findings, we conducted a confirmatory study in the form of an online survey with a larger and more representative sample of teenagers. Our survey consisted of multiple-choice and rating scale questions. We received an approval from the university's research ethics board (application number H17-00785).

4.1 Methodology

Upon further reviewing the literature and considering the findings of our exploratory study, we chose to investigate the following research questions through the survey:

RQ1: What are the characteristics of online privacy teens care about the most?

RQ2: What type of information is perceived among teens to be relatively less/more private?

RQ3: What are the most frequent reasons for not being concerned about posting content on SNSs.

RQ4: What are the measures teens most frequently use to protect their privacy on SNSs?

RQ5: What are the factors linked to the teens' choice of SNSs?

4.1.1 Pilot Study

We initially tested the survey questions on seven participants (five adults and two teenagers) using similar methodology that is described below. Our adult and teen participants were able to accurately comprehend the questions. A number of suggestions were made and implemented to improve the quality of the data. For instance, a follow up question was added to better understand the amount of time teens spend on SNSs.

4.1.2 Participants, Recruitment, and Consent

This study involved 94 participants (52% female), ranging in age from 14-17 (14 — 12%, 15 — 25%, 16 — 22%, and 17 — 32%). All participants resided in Canada. As Table 4.1 illustrates, the province-wide distribution of our sample was fairly similar to the population of the 14-17 year olds across Canada.

TABLE 4.1: Comparison of the study sample and 2017 Canadian 14-17 year olds population across provinces [1].

Province	Participants	14-17 year olds
Canada	94 People	1,558,580 People
Ontario	40%	40%
British Columbia	22%	13%
Alberta	17%	12%
Nova Scotia	6%	3%
Manitoba	4%	4%
Saskatchewan	4%	4%
New Brunswick	4%	2%
NW Territories	2%	0.1%
Quebec	2%	21%
Newfoundland & Labrador	0%	1.4%
Prince Edward Island	0%	0.4%
Yukon	0%	0.1%
Nunavut	0%	0.2%

The results of our exploratory study indicated that Facebook, Instagram, and Snapchat were the most popular platforms among our participants. We initially posted online ads on both Facebook and Instagram. However, we found Facebook ads ineffective, as only one participant contacted us via Facebook. The remaining participants were recruited through Instagram.

In the ads, we instructed the interested and qualified teens to sign-up by contacting the research team via sending a private message on the SNS (Appendix B.1). Once contacted, we sent an initial message to provide more details about the goals of the study, its duration, and the confidentiality of the information (Appendix B.2.1). Parents/guardians consent and participant assent forms were attached to our initial message (Appendix B.2.2).

We used an *opt-out consent* method to obtain permission from teens' parents/guardians. We instructed teens to read the consent form and if they agreed to participate, present the form to their parents/guardians for permission. Interested teens were asked to let us know within five days whether they obtained permission. In the consent form, parents/guardians were asked to email within five days, only if they did *not* wish their child to participate. Each participant received a CAD \$5 Amazon electronic gift card.

4.1.3 Data Collection

Our online survey (see Appendix B.3), hosted on Qualtrics survey service, consisted of several sections that contained multiple-choice and rating scale questions about participants' activities on SNS, their SNS connections, their privacy concerns, content sharing preferences, and demographics.

The survey consisted of five sections. In section one, we asked participants to answer multiple-choice questions on their social networking activities such as usage frequency, devices used, favorite SNSs, and frequency of posting on SNSs. Section two consisted of open-ended and multiple-choice questions that focused on participants' online friends and followers. We obtained estimations on the number of friends and followers participants have on the popular SNSs such as Facebook, Instagram, Snapchat and Twitter. We were

specifically interested to learn about the percentage of the friends and followers they communicate with regularly or have met in person. In section three, we focused on teens' online concerns and private information. Participants were asked to indicate what information they share on their profiles. They were also asked to rate how different statements would apply to them. Statements focused on teens' concerns on unauthorized access to their shared information and their perceived sensitivity level of various types of information. In section four, we focused on teens' content sharing behaviours. Participants were again asked to rate how each statement reflected their online behaviours. These statements focused on the influence of different factors on teens' choice of SNSs when communicating with their friends, the privacy protection methods they use to stay private on SNSs, and their thought process when sharing content online. Lastly, in section five we obtained data on participants' age, gender, their parents' education, city they live in, and their relationship with their peers.

Based on our pilot study, we found the survey took between 10 and 30 minutes to complete. A 10-minute threshold was identified as the absolute minimum amount of time needed to read and answer the survey questions. As such, this was used to exclude responses that were completed in shorter times. The average completion time was approximately 22 minutes. Four participants completed the survey in less than 10 minutes, hence, their responses were eliminated in order to ensure that the integrity of the data was statistically sound. The remaining 90 participants (52% Female) were included in further analysis.

Additionally, to identify careless respondents, we included three attention check questions in the survey (e.g., option *d* of Question 10 in Appendix B.3).

4.1.4 Ethical Considerations

There were no known risks involved for participating in the study. For the analysis purposes, the identities of the participants were anonymized. All data was kept confidential. The anonymity of participants is protected in this report.

Other posts to the Facebook and Instagram pages such as likes or follows were not analyzed. Only teens that sent private messages through the Instagram page were considered for the

study and were provided with additional information on the content of the study. The research team had access to the Instagram page and the messages. All communications with the participants took place through the same platform.

The university's survey tool (Qualtrics) was used to host the surveys. All data was stored and backed up in Canada. In addition to obtaining initial parent consent, participants were asked to provide consent electronically by reading the consent statement and selecting "agree" before starting the survey questions. Since we did not ask for any identifiable information, participants were informed that they were not able to withdraw their responses after submitting the survey. However, if they withdrew before submitting, the incomplete surveys were to be deleted from the server. We did not have any incomplete surveys or participants asking to withdraw from the study.

4.1.5 Data Analysis

Inferential statistics such as the Friedman test [87]¹ and pairwise sign test were conducted to check for statistically significant differences among groups to infer behaviours. Once a significant difference among groups was detected using the Friedman test, we performed the sign test, a non-parametric paired-sample test on each pair, to identify which ones were significantly different. All results of the sign tests reported in this thesis are for p -value $< .05$. To protect against Type I error, the False Discovery Rate (FDR) method was used on all comparisons to adjust the p -values for multiple comparisons. Additionally, Kendall's W (a.k.a Kendall's coefficient of concordance) was used as an effect size statistic to assess the agreement among participants. The value of W ranges from 0, indicating no agreement, to 1, complete agreement.

¹Friedman test is a non-parametric statistical test that identifies significant differences in treatments among participants.

4.2 Results

4.2.1 RQ1: Most Important Privacy Characteristics

Participants were asked to rate how much they care about various privacy characteristics (see Question 14 in Appendix B.3) on the scale from 0 (“Don’t care at all”) to 4 (“Extremely care about”). Privacy characteristics were put into the following statements on teens’ online behaviours:

Content: “The ability to choose what information I share online and what I keep to myself.”

Audience: “Once I posted my information online, the ability to control who can access that information.”

Tagged: “The ability to control what information about me is shared online by others.”

Traceable: “The ability to browse web pages and say things online without other people being able to track me down or look at my activity history.”

Self-image: “The ability to control how I am perceived.”

The summary statistics of privacy characteristics are presented in Table 4.2. There was no significant difference among the five characteristic groups based on the Friedman’s test (chi-squared $\tilde{\chi}^2 = 3.53$, $df = 4$, and p -value = 0.47). As such, we could not determine that the participants cared about some privacy characteristics more than others.

TABLE 4.2: Summary statistics of privacy characteristics.

Factor	Mean	SD	Median
Content	3.20	0.80	3
Audience	3.08	0.86	3
Tagged	3.03	0.94	3
Traceable	2.94	1.10	3
Self-image	2.84	1.10	3

4.2.2 RQ2: Privacy Levels of Online Content

Participants were provided with a list of content types (see Question 11 in Appendix B.3) and were asked to rate how private they find each type of content (e.g., “Romantic Issues”) on the following scale: (5) “I’d NEVER share this with anyone”, (4) “I’d share ONLY with my close friends”, (3) “I’d share with all my friends”, (2) “I’d share with all people on my friends list or followers”, (1) “I’d share with friends of friends”, and (0) “I’d share this with EVERYONE”. The summary statistics of the results are provided in Table 4.3.

Results of Friedman’s test ($\tilde{\chi}^2 = 1056.5$, $df = 18$, $p\text{-value} < 2.2e^{-16}$) indicated that one or more types of information are more important for participants to keep as private. Kendall’s W was greater than 0 ($Wt = 0.65$), indicating some agreement among participants.

Pairwise sign tests revealed that the mean ratings of each item in the following list is significantly higher than the next items on the list and the remaining 11 items: *Financial Info*, *Nude Photos*, *Account PSW*, *Identifiable Info*, *Phone PSW*, *Romantic Issues*, and *Phone Number*. See Table 4.4 for the complete summary.

TABLE 4.3: Summary statistics of perceived privacy level.

Content	Mean	SD	Median
Financial Info	4.98	0.15	5
Nude Photos	4.86	0.59	5
Account PSW	4.77	0.43	5
Identifiable Info	4.51	0.56	5
Phone PSW	4.367	0.53	4
Romantic Issues	3.88	0.81	4
Phone #	3.44	1.01	4
Friends	3.28	1.01	3
Personal Views	2.84	1.54	3
Email	2.82	1.46	3
Hang Out Places	2.62	1.20	3
School Name	2.46	1.48	3
Personal Photos	2.44	1.22	3
City	2.22	1.27	2
Activities	2.10	1.28	2
Age	1.91	1.36	2
Full Name	1.87	1.46	2
Sexual Orientation	1.70	1.67	1
Favorite Shows	1.26	1.35	1

SD stands for Standard Deviation.

TABLE 4.4: Pairwise comparison of participants’ privacy views on the types of online content.

Mean	Content	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	
4.98	a. Financial Info	Blue	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray
4.86	b. Nude Photos	Gray	Blue	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray
4.77	c. Account PSW	Gray	Gray	Blue	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray
4.51	d. Identifiable Info	Gray	Gray	Gray	Blue	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray
4.37	e. Phone PSW	Gray	Gray	Gray	Gray	Blue	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray
3.88	f. Romantic Issues	Gray	Gray	Gray	Gray	Gray	Blue	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray
3.44	g. Phone #	Gray	Gray	Gray	Gray	Gray	Gray	Blue	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray
3.28	h. Friends	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Blue	White	White	White	White	White	White	White	White	White	White	White	White
2.84	i. Personal Views	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Blue	White	White	White	White	White	White	White	White	White	White	White
2.82	j. Email	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Blue	White	White	White	White	White	White	White	White	White	White
2.62	k. Hang Out Places	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Blue	White	White	White	White	White	White	White	White	White
2.46	l. School Name	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Blue	White	White	White	White	White	White	White	White
2.44	m. Personal Photos	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Blue	White	White	White	White	White	White	White
2.22	n. City	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Blue	White	White	White	White	White	White
2.10	o. Activities	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Blue	White	White	White	White	White
1.91	p. Age	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Blue	White	White	White	White
1.87	q. Full Name	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Blue	White	White	White
1.70	r. Sexual Orientation	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Blue	White	White
1.26	s. Favorite Shows	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Blue

How to read: Each *content type* is assigned an alphabetic letter and is listed in the 2nd column (e.g., *a. Financial Info*). Each cell with the corresponding letter represents that content. Each column represents a pair-wise comparison between one content (the cell that is highlighted in blue) and the rest. The gray cells indicate contents that are found significantly different from the blue content. If gray contents are above the blue content, they are found significantly higher.

4.2.3 RQ3: Justifications for the Lack of Concerns

To learn about the popular rationale that teens use for not being concerned when posting content on SNSs, we asked participants to rate how well the following justifications apply

to their behaviours (Question 15 in Appendix B.3). The rating scale ranged from 0 (“never true for me”) to 3 (“always true for me”).

Nothing to Hide: “I don’t believe I have anything to hide.”

Unlikely to Happen: “I believe I am unlikely to have my privacy invaded online.”

Able to Deal: “If privacy invasions happen online, I am confident that I can deal with the consequences and stay away from harm.”

Take Precautions: “I feel like when I am interacting online, I take the necessary precautions to stay safe.”

Unconcerned with Authorities: “I do not worry about having my privacy being invaded online by authorities and strangers that I don’t know.”

Unconcerned with Parents: “I do not worry about having my privacy being invaded online by my parents and other adults.”

Unconcerned with Friends: “I do not worry about having my privacy being invaded online by my friends/classmates/other peers.”

No Direct Influence: “If there is no direct influence on my personal life, I do not mind other people accessing my online content.”

The summary statistics are provided in Table 4.5. There was some agreement among our participants (Kendall’s $Wt = 0.06$) that some of the 14 rationale applied to their online behaviors more than others (Friedman’s test $\tilde{\chi}^2 = 35.85$, $df = 14$, $p\text{-value} < 7.745e^{-06}$).

TABLE 4.5: Summary statistics of lack of privacy concern justifications.

Rationale	Mean	SD	Median
Take Precautions	2.11	0.69	2
Able to Deal	2.06	0.81	2
No Direct Influence	1.83	0.96	2
Nothing to Hide	1.79	0.88	2
Unconcerned with Friends	1.78	0.92	2
Unlikely to Happen	1.68	0.85	2
Unconcerned with Authorities	1.63	0.98	2
Unconcerned with Parents	1.50	1.06	2

The pairwise sign tests revealed that although not significantly different from each other, the mean rating of *Take Precautions* and *Able to Deal* were found significantly higher than the three rationales of *Unlikely to Happen*, *Unconcerned with Authorities*, and *Unconcerned with Parents*. See Figure 4.6 for the complete summary.

TABLE 4.6: Pairwise comparison on lack of privacy concern justifications.

Mean	Rationale	a	b	c	d	e	f	g	h
2.11	a. Take Precautions								
2.06	b. Able to Deal								
1.83	c. No Direct Influence								
1.79	d. Nothing to Hide								
1.78	e. Unconcerned with Friends								
1.68	f. Unlikely to Happen								
1.63	g. Unconcerned with Authorities								
1.63	h. Unconcerned with Parents								

How to read: Each *rationale* is assigned an alphabetic letter and is listed in the 2nd column (e.g., *a. Take Precautions*). Each cell with the corresponding letter represents that rationale. Each column represents a pair-wise comparison between one rationale (the cell that is highlighted in blue) and the rest. The gray cells indicate rationales that are found significantly different from the blue rationale. If gray rationales are above the blue rationale, they are found significantly higher.

4.2.4 RQ4: Tactics for Privacy Protection

To learn about popular protective measures that teens use to stay private on SNSs, we asked participants to rate from the scale of 0 (“never true for me”) to 3 (“always true for me”), how much each of the following protective measures described their online behaviours (Question 13 in Appendix B.3):

Private Communication: “To share personal matters with friends, I use private modes of communications (such as Facebook Messenger, texting, and calling), rather than sharing the content on my social networking sites.”

No Regrets: “I don’t share something online that I would regret later.”

Privacy Settings “I use privacy settings to protect myself online.”

Consequences: “I carefully consider who I share my online content with and the consequences of sharing it.”

No Personal Info: “I don’t share too much about myself online.”

No Strangers: “I don’t accept requests from online strangers or respond to their messages.”

Not Posting Much: “I don’t post much information online.”

Multiple Accounts: “For some social networking sites, I have multiple accounts that I use for different purposes (e.g., 2 Instagram accounts).”

Delete Unpopular: “I delete content that I’ve posted online, if it doesn’t gather enough attention.”

Delete Received: “I delete some comments and messages that I receive online after I read them.”

Hide Meaning: “When I share things online, I hide the meaning so that only my friends can understand what I am saying.”

Adults Help: “My family and friends help with configuring my privacy settings on social networking sites.”

Fake Info: “I provide fake or inaccurate personal information online, such as a fake name, address, phone number, and email address.”

Delete Posted: “I delete some comments and other content that I leave on others’ pages some time after I post them.”

Deactivate: “I keep my social networking accounts (e.g., Facebook, Instagram) deactivated when I am not using them, to stay private.”

Table 4.7 reports summary statistics on these protective measures. There was an agreement among participants (Kendall’s $Wt = 0.44$) that they used some of the 15 protective measures more than others (Friedman’s test $\tilde{\chi}^2 = 559.99$, $df = 14$, $p\text{-value} < 2.2e^{-16}$).

TABLE 4.7: Summary statistics of popular protective measures.

Protective measure	Mean	SD	Median
Private Communication	2.68	0.58	3
No Regrets	2.46	0.80	3
Privacy Settings	2.17	0.90	2
Consider Consequences	2.08	0.85	2
No Personal Info	1.88	0.87	2
No Strangers	1.84	0.99	2
Not Posting Much	1.83	0.92	2
Multiple Accounts	1.54	1.18	2
Delete Unpopular	0.96	0.98	1
Delete Received	0.94	0.798	1
Hide Meaning	0.90	0.67	1
Adults Help	0.74	0.96	0
Fake Info	0.72	0.81	1
Delete Posted	0.52	0.64	0
Deactivate	0.51	1.00	0

The privacy measures in the above list are shown in descending order of their mean ratings. As such, below we explain only the statistically significant differences between each measure, and the measures below it. The pairwise sign tests revealed that the mean rating of *Private Communication* was significantly higher than all the remaining 14 measures. Next on the list, *No Regrets* was found significantly higher than all the remaining measures except one (*Privacy Settings*). Next, *Privacy Settings* measure was found significantly higher than 10 out of 12 remaining measures; no significant difference was found with *Consider Consequences*, and *No Personal Info*. Lastly, the mean ratings of *Deactivate* and *Delete Posted* were found significantly lower than all the other protective measures. However, they were not found significantly different from each other. See Figure 4.8 for a full summary.

TABLE 4.8: Pairwise comparison on protective measures.

Mean	Protective measure	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
2.68	a. Private Communication															
2.46	b. No Regrets															
2.17	c. Privacy Settings															
2.08	d. Consider Consequences															
1.89	e. No Personal Info															
1.84	f. No Strangers															
1.83	g. Not Posting Much															
1.54	h. Multiple Accounts															
0.96	i. Delete Unpopular															
0.94	j. Delete Received															
0.90	k. Hide Meaning															
0.74	l. Adults Help															
0.72	m. Fake Info															
0.52	n. Delete Posted															
0.51	o. Deactivate															

How to read: Each *protective measure* is assigned an alphabetic letter and is listed in the 2nd column (e.g., *a. Private Communication*). Each cell with the corresponding letter represents that measure. Each column represents a pair-wise comparison between one measure (the cell that is highlighted in blue), and the rest. The gray cells indicate measures that are found significantly different from the blue measure. If gray measures are above the blue measure, they are found significantly higher.

4.2.5 RQ5: Factors Linked to the Choice of SNS

We asked participants to rate the importance of the following factors in determining which SNS they use (Question 12 in Appendix B.3). The rating scale ranged from 0 (“Not at all important”) to 4 (“Extremely important”).

Friends' Access: “My expectations of how my friends access and use various social networking sites (e.g., constantly using Snapchat, rarely using Facebook, and don't have Twitter).”

Content Type: “Type of the content that I am planning to share with my friends (e.g., text, images, videos, articles, media news, and opinions).”

Content Sensitivity: “Sensitivity of the content that I am planning to share with my friends (e.g., mundane content on Snapchat, lifestyle photos on Instagram, media news on Facebook, and my romantic troubles via Facebook Messenger).”

Adults' Access: “Whether I want my parents, relatives, and/or other adults to see what I post online (e.g., whether my parents are my Facebook friends).”

Relationship Level: “How close I am with the people that I intend to share my content with (e.g., close friends on Snapchat and acquaintances on Facebook).”

SNS Constraints: “What the social networking site allows me to do online (e.g., group chatting, direct messaging, and video calls).”

Contact Urgency: “The urgency of the interaction (e.g., calls for asking for a ride and Facebook Messenger for daily updates).”

Table 4.9 presents summary statistics of these factors. Results of Friedman's test ($\tilde{\chi}^2 = 25.318$, $df = 6$, p -value < 0.0003) revealed that there was an agreement among participants (Kendall's $Wt = 0.05$) that one or more factors influenced their choice of SNS more than others.

TABLE 4.9: Summary statistics of factors in determining the choice of SNS.

Factor	Mean	SD	Median
Adults' Access	2.57	1.19	2
Content Type	2.52	0.85	3
SNS Constraints	2.51	1.08	3
Relationship Level	2.33	0.95	2
Contact Urgency	2.31	1.01	2
Content Sensitivity	2.22	.17	2
Friends' Access	2.02	1.06	2

The pairwise sign tests revealed that the ratings of *Adults' Access* was significantly higher than the ratings of *Content Sensitivity*, and *Friends' Access*. Additionally, the ratings of *Friends' Access* was found significantly lower than the three factors of *Content Type*, *SNS Constraints*, and *Contact Urgency*. Complete results of the pairwise comparison test are provided in Table 4.10.

TABLE 4.10: Pairwise comparison on influential factors.

Mean	Factor	a	b	c	d	e	f	g
2.57	a. Adults' Access							
2.52	b. Content Type							
2.51	c. SNS Constraints							
2.33	d. Relationship Level							
2.31	e. Contact Urgency							
2.22	f. Content Sensitivity							
2.02	g. Friends' Access							

How to read: Each *factor* is assigned an alphabetic letter and is listed in the 2nd column (e.g., *a. Adults' Access*). Each cell with the corresponding letter represents that factor. Each column represents a pair-wise comparison between one factor (the cell that is highlighted in blue) and the rest. The gray cells indicate factors that are found significantly different from the blue factor. If gray factors are above the blue factor, they are found significantly higher.

4.3 Discussion

Through our confirmatory study, we aimed to answer five research questions on teens' interactions on SNSs. In this section, we summarize our findings. In Chapter 5, we discuss the findings of our exploratory and confirmatory studies in more detail and compare them with previous findings.

RQ1: Most Important Privacy Characteristics

Due to the lack of statistically significant differences in the data, we are unable to identify which characteristics teens care about most with respect to their online privacy.

RQ2: Privacy Levels of Online Content

Through our analysis, we found that teens perceive financial information, nude photos, account passwords, identifiable information (e.g., home address and SIN), phone passwords, and romantic or family issues as types of private information that they would only share with their close friends or never share with anyone at all.

RQ3: Justifications for the Lack of Concerns

Our results highlight that the presence of adults in a SNS is perceived as more influential in determining teens' choice of SNS, compared to the sensitivity of the content teens intend to share or the degree of their friends access to the SNS.

RQ4: Tactics for Privacy Protection

Our results indicate that using private modes of communication, not sharing regrettable content online, and using privacy settings are among the most popular strategies teens utilize to protect themselves on SNSs.

RQ5: Factors Linked to the Choice of SNS

Lastly, we found that the two justifications of taking necessary precautions online and being capable of dealing with consequences of privacy invasions are used often among teens. This is compared to the beliefs that privacy invasions are unlikely to happen to teens, or that they do not worry about having their privacy invaded by authorities, strangers, parents, or other adults.

Chapter 5

Discussion and Implications

In this thesis, we sought to expand our current understanding of Canadian teens' notion of privacy and online interactions in order to better communicate with them and empower them to exercise best safety practices. To this end, we extend past findings of three different aspects of online privacy with regards to SNS usage: (1) teens' general perception of online privacy, (2) their online concerns, and (3) decision-making processes about information disclosure. In the following sections, we discuss our findings, compared with other related research on adults and teens, and highlight implications.

5.1 Perception of Online Privacy

To shed more light on teens' view on online privacy, we first asked our participants to describe it in their own terms and provide us with examples of privacy invasions. Next, in our confirmatory study, we aimed to identify online privacy characteristics that our participants care about the most along with the information that they perceive as more/less private.

5.1.1 What is online privacy?

Understanding the core aspects of teens' conceptualization of privacy is key to refining privacy theories. It is also necessary for designing better options to help teens to be active agents in protecting themselves online. Previous studies found that teens view their online privacy as the *ability to control* (1) *what* information they share on SNSs, (2) with *whom* they share that information, and (3) how they are *perceived* online [22, 70]. Similar to young adult's conceptualization of privacy [72], our findings suggest that teens have a broader definition of privacy compared to the adults. We found that their definition includes the ability to control (4) what information *other people share* about them and the ability to (5) engage in online activities without having their activity *traced back to them*. The lack of statistically significant differences in the data for RQ1 from our confirmatory study (Section 4.2.1) warrants further investigation of whether these five abilities constitute the core privacy characteristics that form teens' notion of online privacy.

5.1.2 What is private?

Previous research has found that perceived sensitivity of the personal information has a great impact on the perception of online privacy [63]. In 1993, Weible has defined "*information sensitivity*" as "*the level of privacy concern an individual feels for a type of data in a specific situation*" [88, p. 30]. Information sensitivity among adults varies from person to person as well as by situation [89]. Additionally, some types of data are more sensitive than others [89]. For instance, financial and medical information are considered highly sensitive [90], whereas, information about product purchases and media habits is perceived as less sensitive [63, 89].

Similar to findings on adults and on young people by Bryce and Fraser [34], our study confirmed that teens perceive some types of information as more private than others. Through our confirmatory study, we expanded and elucidated this list: information linked to the risk of physical threats and real-life consequences (e.g., addresses, financial information, passwords, and phone numbers), content with unfamiliar invasion consequences (e.g., social security numbers), "stupid" or "crazy" photos, nude or inappropriate photos (e.g.,

while smoking or drinking), offensive comments, romantic crushes, and relationship statuses. Among these items, our findings suggest that teens find financial information, nude photos, account passwords, identifiable information (e.g., social insurance numbers), and medical information to be the most private and they are less likely to share them with anyone. They agreed that other information, such as phone passwords and romantic or family issues (crushes, breakups, family dramas), is less private. Hence, they would be willing to share such information but only with close friends.

Such findings can help parents and educators better understand the extent to which various types of information are shared online. Although it is safe to say that teens' privacy intentions are to keep perceived risky personal information to themselves, future studies should examine cases where teens' privacy intentions and actual behaviours differ.

5.2 Online Privacy Concerns

The results of our interviews provided a more comprehensive list of teens' privacy concerns on SNSs (Chapter 4, section 3.5.2). Although most online safety educational curricula target security concerns (e.g., *stranger danger* messaging) [29], teens' concerns about their social status play a major role in influencing their online interactions.

Our findings can help parents and educators design privacy protection programs that better address teens' online concerns to improve their privacy on SNSs. For instance, targeting teens' concerns about social status and explaining the potential invasion consequences can have a stronger influence in encouraging them to stay safe on SNSs.

5.3 Decision-making Process on Information Disclosure

In this thesis, we sought a better understanding of teens' online decision-making processes. This included diving deeper into their online privacy protection measures, the factors that influence their choice of SNSs, and identifying major rationales they have to justify their lack of privacy concerns.

5.3.1 Determining the choice of SNS.

Studies on adults have shown that users have distinct attitudes toward different SNSs [91] and each SNS has its unique purposes [92]. For instance, Dwyer et al. [91] reported that compared to MySpace users, Facebook users trust Facebook and its members significantly more. They are also more willing to share personally identifiable information on Facebook. Other factors, such as the gained gratifications on a platform, influence users' choice of SNS [93]. For instance, Twitter users gain social capital on weak and distant ties with a diverse network [94]. On the other hand, Snapchat users gain gratification on strong relationships and emotional support from their interactions [93, 95].

The results of our study suggest that teens' privacy concern is another factor that influences their choice of SNSs. We found that to protect their privacy, teens make decisions about which SNS to use. Our findings expand the list of the previously reported factors and identified those factors that are more influential. In addition to considering aspects such as the audience's consumption of SNSs, technical affordance, timing, and disruption (e.g., calls for urgent, text for non-urgent matters), their friends availability on SNSs, costs [70], and the presence of parents and other adults on SNSs [96], teens consider other factors such as their relationship with the intended audience (e.g., close friends on Snapchat, acquaintances on Facebook), types of activity, content type, and the perceived level of sensitivity of the shared information (e.g., mundane photos on Snapchat, lifestyle photos on Instagram, and news articles on Facebook). Further, we found that adults' presence on a SNS (i.e., whether teens want their parents, relatives, and/or other adults to see what they post online) is a more important factor than the sensitivity of the content they intend to share or their expectations of how their friends consume SNSs. Surprisingly, this last factor about how their friends use SNSs was found to be the *least important* in determining teens' decisions, compared to the type of the content they intend to share, technical affordance, how close they are with their audience, or the timing and disruption of the interaction.

Our findings contribute to the knowledge base on teens' online decision-making processes, which can help future researchers better understand how they use SNSs. For instance, future research should consider the importance of teens' concerns about their social status

when investigating their use of various social networking platforms. Lastly, teens' choice of SNSs and their activities on each platform should be considered when providing them with relevant privacy information. For example, talking about privacy breaches on Facebook may not resonate with teens, if they mainly use Snapchat to communicate with their friends.

5.3.2 Popular protective measures.

In a study about disclosure of personal information on SNSs, Young and Quan-Haase report that adults' privacy protection measures include exclusion of personal information, using privacy settings, and use of private modes of communications such as emails [97]. Additionally, findings by Tufekci [98] on college students highlight that students also use privacy settings to alter the visibility of their online profile and use nicknames, instead of real names, to protect their privacy.

The results of our research extend past findings and provide a more comprehensive list of protective measures that teens employ to address their privacy concerns. Previous studies on teens [22, 32, 70] report such measures as using privacy settings, encoding the content (referred to as "steganography"), manipulating the technical affordance (e.g., deactivating their account during the day or deleting all communications after), concealing or obscuring information, providing inaccurate identifiable (e.g., name, age, and location) and other personal information, refusing to provide information, maintaining multiple profiles, and flaming.¹ Our findings suggest that teens' protective measures also include the avoidance of sharing "too much" or "personal" information online, using privacy settings and SNSs features such as deleting content or accounts, limiting contacts with strangers, using more private modes of communications (e.g., Facebook direct messaging, texting, and calling) for sharing personal matters, asking family members for help on who can see teens' content, and carefully considering the consequences of sharing their content online. We further identified private modes of communication as the most popular protective measure used by teens, followed by avoiding sharing something online that they would regret later. After

¹Flaming is the act of sending highly negative messages to those sending unsolicited emails.

these two measures, the use of privacy settings was found more popular than many (but not all) other measures, such as not adding strangers, claiming not to post much, or deleting content. As expected, temporary deactivation of accounts and deleting content that they had posted online were among the least popular measures. Surprisingly, providing fake or inaccurate personal information was also among the least used protective measures.

These findings can help parents and educators better communicate with teens on their approaches to privacy to help them navigate and manage the online risks. Additionally, future research is needed to measure the effectiveness of these measures in order to clarify and address potential shortcomings.

5.3.3 Justifications for the lack of concerns.

Our study revealed major rationales for teens' lack of concern, when they share content online. Teens justify by claiming that they take the necessary precautions to stay safe. They believe that they can deal with the consequences of privacy invasions, security breaches are unlikely to happen to them, and that they have nothing to hide or nothing important. This is similar to research findings on adults and older teens [37, 74]. Krasnova et al. [74] report that perceived likelihood of a privacy violation is a primary determinant of adults' self-disclosure on SNSs. Additionally, it was found that older teens who believe that they are capable of protecting themselves on SNSs have less privacy concerns.

Our findings highlight that teens also believe that access to their information by SNSs' operators or government has no direct effect on their lives. Our findings further identify that the two justifications—taking the necessary precautions and being able to deal with the consequences—are more common among online teens. This is compared to the beliefs that privacy invasions are unlikely to happen to teens, or that they do not worry about having their privacy invaded by authorities, strangers, parents, or other adults.

Our findings provide a deeper insight on teens' online behaviours, which can help with the development of models to explain online information disclosure and privacy paradox.

5.4 Limitations

Our work has several limitations. Due to the self-reported nature of the data, a common issue with individual interviews and an online survey is the possibility of inconsistencies between participants' descriptions and their actual behaviours. Participants' desire to portray a positive self-image or memory limitations may influence their responses. However, using self-reported data collection method in exploratory studies is essential for an unconstrained exploration of the subject matter [99].

Our results are constrained by the data we obtained from a sample of participants recruited through one SNS (Facebook for the exploratory study and Instagram for the confirmatory study). Additionally, our participants were teenagers who responded to online ads. Hence, since our sample is not representative of all teenage Canadian SNS users, we are unable to generalize the findings of our confirmatory study. For instance, teens who use other SNSs and never respond to online ads may potentially display different online behaviours. Further research with a larger and a more representative sample of the population is necessary to establish the external validity of our findings.

Furthermore, we did not factor in gender and individual differences in analyzing the results of our studies. Previous research has indicated the importance of examining such factors in online behaviors [100]. A study on adults Facebook users found significant differences between genders in SNSs usage purposes [101]. For instance, males favored making new contacts, whereas females favored maintaining existing relationships. Such differences can help us better understand teens' online decision-making processes and online perceptions.

Lastly, in qualitative studies such as our exploratory study, the researchers' life experiences, personal views and cultural background can influence the insight obtained from the data [81]. For instance, during the data collection and coding process, the researcher's thoughts can affect the design of the interview guide and the interpretation of the collected data. Inevitably, that will influence the categories that emerge from the data [102]. Since it is impossible to completely void our minds, we took measures to reduce the researcher's bias through triangulation [82]. Investigator triangulation [103] was done by involving an

expert in designing the interview guide and conducting the interviews. The emergent theory was also discussed with multiple researchers to ensure that our analysis was grounded in the data. Methodological triangulation [103] was done by obtaining data through multiple methods including interviews and an online survey,

Chapter 6

Conclusion

Our work provides a detailed look at a diverse group of Canadian teens' privacy-related concerns, online decision-making processes, and rationales when using SNSs. We conducted qualitative ($N = 20$) and quantitative ($N = 94$) studies with Canadian teens recruited from Facebook and Instagram (*hereafter, teens*).

Exploratory Study

Grounded on the data we collected, we developed a theory that teens do care about their online privacy and their online concerns are directly linked to their conceptualization of online privacy. We theorized that teens' concerns shape how they share content on SNSs. For instance, teens have various justifications to address their privacy concerns and feel safe on SNSs. One important justification is taking measures to protect their privacy and safety which includes choosing which SNS to use.

Through our exploratory study, we confirmed previous findings that privacy among teens includes the ability to control their content, audience, and the image they portray on SNSs. However, we found that teens have a broader notion of privacy. They also view privacy as the ability to control what information is shared about them by others and the ability to engage in online activities without other people tracing the activities back to the teenagers or interfering with those activities.

We found that teens describe information linked to physical threats or real-life consequences such as addresses, financial information, passwords, and phone numbers as private. They consider contents (e.g., social security numbers) with unfamiliar privacy invasion consequences as private. Additionally, “stupid”, “crazy”, nude or inappropriate photos of them smoking or drinking, offensive comments, and their romantic crushes were also perceived as private.

Furthermore, We identified *social status* and *security* concerns as the two major categories of teens’ online privacy concerns. We found that the majority of teens’ information disclosure behaviours are influenced by the former.

Despite these concerns, our results highlighted that teens have various justifications to feel safe on SNSs. (1) Teens take measures to protect their privacy online. (2) They feel that they are capable of dealing with the consequences of a privacy invasion and (3) that security breaches are unlikely to happen to them. (4) Teens believe that they have nothing to hide and (5) they are not concerned if a privacy invasion has no direct effect on their lives.

Further analysis of teens’ protective measures confirmed previous findings that teens take measures such as (1) using privacy settings, (2) manipulating the technical affordance (e.g., deleting comments and messages), and (3) maintaining two different accounts on one platform in order to protect their privacy on SNSs. We also found additional measures that teens take to ensure their privacy and safety online. (4) Teens avoid sharing “too much” or “personal” information online. (5) They limit their contact with strangers, (6) use private modes of communication such as Facebook direct messaging, texting, or calling for sharing personal matters, (6) ask family members or their friends for help on who can view their content, (7) carefully consider the consequences of sharing their content online, and (8) decide which SNS to use in order to communicate with their audience.

Lastly, the results of our analysis highlighted that teens consider various factors in deciding which SNSs to use. Confirming previously existing findings, (1) we found that teens account for their intended audience (2) how they consume different SNSs, (3) the technical affordance (what the platform allows them to do), and (4) the cost (e.g., free WiFi) in choosing

which SNSs to use. (5) We added that the content type (e.g., photos, text or videos) and (6) the perceived level of content sensitivity (e.g., mundane photos on Snapchat, lifestyle photos on Instagram, News articles on Facebook) also influence teens' decisions.

Confirmatory Study

In our confirmatory study, (RQ1) we failed to identify which privacy characteristics teens care about the most. (RQ2) We confirmed that teens perceive certain types of content as more private than others and provided a more detailed ranking of their response. Our findings revealed financial information, nude photos, account passwords, identifiable information (e.g., home address and SIN), phone passwords, and romantic or family issues as types of private information that teens would only share with close friends or never share with anyone at all. (RQ3) We highlighted the major influential rationales in teens' lack of privacy concerns. We found that teens justify they are safe online because they take the necessary precautions and that they are capable of dealing with consequences of privacy invasions. (RQ4) We confirmed that similar to adults, participants in our sample care about their privacy and take measures to stay safe online. Our findings highlight a variety of protective tactics that teens employ to manage their privacy. In particular, we observed that using private modes of communication, not sharing regrettable content, and using privacy settings are among the most popular tactics. (RQ3) Lastly, the results of our study show that teens' choice of SNS is yet another protective measure. Focusing on the factors that influence this choice, we identified the presence of adults in a SNS as a key factor that is perceived as more important than the sensitivity of the content teens intend to share or their friends access to the SNS.

Our findings have implications for parents and educators. Through considering teens' point of view, their online privacy concerns, and how they interact on SNSs, parents and educators can more effectively communicate with teens about the consequences of privacy invasions. Additionally, through further research, we should investigate the effectiveness of teens' protective tactics and highlight potential shortcomings in order to empower teens to better protect themselves from adverse consequences.

Appendix A

Exploratory Study

A.1 Pre-Interview Survey

1. How old are you?——
2. What grade are you in? (Mark only one.)
 8th, 9th, 10th, 11th, 12th
3. What do you identify your gender as?
 Female, Male, Transgender, Prefer not to answer
4. With whom do you live? (Mark only one.)
 Both parents, Mother, Father, Siblings, Roommates, Other:——
5. What is the highest level of education that your parents/guardian have? (Mark only one.)
 Less than high school, High school, Some college, Bachelor, Post Graduate, Not sure, Prefer not to answer, Other:——
6. How often do you use internet on your phone, computer, tablet or other mobile device(s)? (Mark only one.)
 Daily, Almost constantly, Several times a day, About once a day, Weekly, Several times a week, Once a week, Less often

-
7. Please select the devices that you have or have access to. (Check all that apply.)
- A smartphone, A cellphone that is not a smartphone, A desktop computer,
 A laptop, A tablet (e.g., iPad, Samsung Galaxy), Other:——-
8. Which of the following social media services do you use? (Check all that apply.)
- Facebook, Twitter, Snapchat, Tinder, Instagram, Google+, Vine,
 Tumblr, Other:——-
9. Which of these social media services do you use MOST often? (Check all that apply.)
- Facebook, Twitter, Snapchat, Tinder, Instagram, Google+, Vine,
 Tumblr, Other:——-
10. How many friends do you have on Facebook? (Mark only one.)
- I don't use Facebook, 0 - 100, 101-200, 201-300, 301-500, 501-1,000,
 More than 1,000 friends, Not sure, Prefer not to answer
11. How many friends do you have on Twitter? (if applicable.)
- Mark only one oval., I don't use Twitter, 0 - 100, 101-200, 201-300,
 301-500, 501-1,000, More than 1,000 friends, Not sure, Prefer not to
answer
12. How many friends do you have on Instagram? (if applicable.)
- Mark only one oval., I don't use Twitter, 0 - 100, 101-200, 201-300,
 301-500, 501-1,000, More than 1,000 friends, Not sure, Prefer not to
answer
13. What information do you share online? (Check all that apply.)
- Full Name, Age, Phone Number, Email Address, Home Address, School
Name, Medical Information, Credit Card, Favorite TV Show, Favorite
Snack, Other:

A.2 Interview Script

Introduction

Hello, good morning/afternoon. My name is ** and my colleague's name is **. We will be moderating your interview today. Can we get you a glass of water or anything else to drink?

To begin, we would like you to review this assent form. It contains important information about today's interview. If you assent to the terms and would like to participate in the study, please sign the form and hand it back to us.

You and your classmates are one of the first groups of people in the world to grow up using computers and Internet. We want to learn more about what it is like for you to grow up using computers and the Internet, and what we can do to make these things more safe and fun. Our interview will take approximately one hour. You are free to choose not to answer any questions, or to stop the interview at any point if you feel uncomfortable. We greatly value your honest and candid responses.

We would like to make an audio recording of this session. This recording will only be used for the purposes of this study and will only be accessible to the researchers. Do you consent to having this session audio recorded?

Interview Questions

Privacy

[To learn about online privacy, private information, and invasion of privacy.]

- How would you explain privacy to someone? What does (online) privacy mean to you? How would you describe privacy?
- What is private information to you? Examples?
- What are some content that you won't share with anyone?
- What is the most personal content that you have shared online (posted or through Facebook messenger)?

- What would be an example of something that you will never share online? Why is that?
- How would you feel if your friends share photos of you? Or tag you in posts?
- What do you consider as an invasion of your privacy?
- How would you feel if someone accesses the information that you never share online without your consent? (eg., on your phone or laptop)
- What would be some consequences of that?
- How likely do you think this is to happen?
- How would you feel if someone gain access to the information that you have shared on social media without your consent?
- What would be some consequences of that?
- How likely do you think this is to happen?
- How would you feel if websites or businesses access the information that you share on social media?
- What would be some consequences of that?
- How likely do you think this is to happen?
- How would you feel if your friends re-share your content without your consent?
- What would be some consequences of that?
- How likely do you think this is to happen?

Safety

- How do you explain online safety to someone?
- Do you feel safe online?
- Why do you think you need to be safe?
- What are some online safety threats? Can you give me some examples?
- What experiences have you had that made you more sensitive to online privacy? Experiences that now make you be more cautious? (For example cyberbullying or someone stalking you)
- Have you had any negative experiences online? Any situation that has made you uncomfortable?

Concerns

[To learn about their online concerns on each platform, and what info they see as private.]

- What are some of your privacy concerns?
- What was the most recent content that you shared online?
- What do you think about right before sharing something online?
- How about when commenting? Or liking something online?
- How is your thought process different when sharing something on Facebook, vs. Instagram, vs. Snapchat, vs. Twitter?
- Do you think more about staying safe online, or presenting a good image?
- If you want to share something very private, which SNS do you choose?
- Which platform do you feel you have the most privacy?
- Which platform do you feel more comfortable to share content on?
- Do you feel safer on one platform versus another? Why?
- Have you ever posted something and regretted it later?
- If you could start over with your social networking accounts, what would you do differently?

Protective Measures

[To learn about what platforms they use and for what purposes. Delving deeper into their privacy settings for each SNSs and how that helps them to stay safe.]

- What do you do to stay private?
- What safety measures do you take?
- Can you tell me about how you use different SNSs?
- What makes you use them differently?
- Which one do you use more often?
- How is your group of friends different on each SNS?
- What kind of information do you have on your Facebook profile?
- Can you tell me about the privacy settings of your accounts? How are they different from each other and why?

- who can see you posts? Do you review all the posts and things that you're tagged in? Who can send you friend requests? Who can post on your timeline? Who can see what others post on your timeline?
- Do you share your passwords with anyone? Why?
- How do you compare your online behaviour with your friends (or people you know)? Are they more active than you? More private/public compared to you?

Appendix B

Confirmatory Study

B.1 Instagram Recruitment Ads

FIGURE B.1: Instagram ads posted on July 24 and August 1, 2018.



FIGURE B.2: Instagram ads posted on August 6 and August 14, 2018.



B.2 Confirmatory Study Participant Recruitment

B.2.1 Initial Contact Message

Project Title: Understanding Influential Factors on Teenagers' Online Concerns

Hi [Participant's Name]

Thank you for your interest! The aim of this research is to learn about teenagers' experiences with socializing online. Through an online survey that will take about 30 minutes, you will be asked questions about your interactions with social networking sites. This survey is anonymous. Your responses will stay confidential. There is no link between you and your responses, and they are only accessed by the research team.

Attached, please find a consent form that explains the interview process and goals in more detail to you and your parents/guardians. Please read carefully. Once you decide and agree to participate in the study, you are required to pass the consent form to your parents/guardians. Please get back to us no later than [Date, 5 days after this message is sent] to inform us about their decision. Once they grant you permission, we can set a date that works best for you in order to send you the link to the survey.

You will be compensated for your time with a \$5 Amazon gift card.

If you have further questions, please do not hesitate to ask. We appreciate your help!

B.2.2 Parental and Teen/Participant Consent Form

Project Title: Understanding Influential Factors on Teenagers' Online Concerns

Principal Investigator: Konstantin Beznosov, Professor, Dept. of Electrical and Computer Engineering, [phone number],[email address] Co-Investigator: Salma Kashani MSc., Dept. of Electrical and Computer Engineering, [phone number], [email address]

You (the teenager) are invited to participate in a research study conducted by the University of British Columbia that will be occurring in the coming weeks. Please take a moment to review this information about the study.

Purpose: Social networking sites (SNSs) are an integral part of many teens' lives. As reported by MediaSmarts in 2014, an overwhelming majority of Canadian students (9 to 17 years-old) are Internet users. Of those, 57% reported Facebook as their favourite website. More than 40% indicated some social networking related activities, such as posting content and following friends, as their most frequent online activities. Our study investigates how teens socialize online.

Procedure: This study involves having you (the teenager) complete an online survey about your online behaviours. You will be asked about your access to the Internet, what devices you use, and which SNSs you use often. You will be asked to rate different aspects of your experiences on SNSs. To gain a better sense of who you are, we ask demographic questions such as age (year and month of birth), gender and parents'/guardians' education levels. The survey will take approximately 30 minutes to complete. You can access the survey from any location of your choice, using any computer or mobile device.

While there are no known risks associated with this study, should you feel uncomfortable, you have the right to withdraw from the study without any penalty, before submitting the survey. Once submitted, due to the anonymous nature of the survey, you will not be able to withdraw your responses.

To ensure that you are feeling safe to respond to the survey as honestly as possible, all the information provided will be kept confidential. All the identifying information that includes the social networking communications will be kept separate from the main survey data in different password-protected electronic folders. Only individuals in the research team will have access to the Facebook, Instagram or Snapchat messages, and the survey data. Pseudonyms and modified information will be used to reference you during the study and when reporting the completed study. Communication through Facebook, Instagram or Snapchat will be retained for five years and deleted after. All electronic files will be stored in password-protected folders in secure computers or a USB portable drive that is

kept in locked filing cabinets at the University of British Columbia. These files will be permanently deleted after five years.

The results of this research will contribute to Salma Kashani master's thesis, which will be available publicly.

To express our appreciation for participation in this study, each participant will be offered an online Amazon gift card worth \$5. You will receive the gift card independent of completing or withdrawing from the study.

If you have any concerns or complaints about your rights as a research participant and/or your child's experiences while participating in this study, contact the Research Participant Complaint Line in the [University] at [phone number] or if long distance e-mail [email address] or call toll free [phone number].

To Parents: If you DO NOT wish your child to participate in this study, please email us within 5 days to [email address], providing the name of your child and indicating your unwillingness for your child to participate in this study. We will confirm your email message.

If you have questions or desire further information about this study, please contact Salma Kashani.

B.3 Online Survey Questions

Consent Statement Thank you very much for agreeing to participate in our study by completing this survey. This anonymous survey gathers information on your online concerns and behaviours when using social networking sites (SNSs). While you are not obligated to respond to every question, answering as many questions as possible will help us gain a better understanding on how teens interact online. The provided information will not be used in a manner which would allow identification of your individual responses.

Please note that completing this survey will demonstrate that you give your consent for data to be analyzed, and the results be published at scientific conferences and journals. You acknowledge that your participation is voluntary and that your refusal to participate involves no penalty. You may discontinue participation at any time before submitting the survey. The incomplete surveys will be deleted from the server. However, due to the anonymous nature of this survey, you will not be able to withdraw your responses once they have been submitted.

Agree

Section 1: Your Social Networking Activities *The following questions help us understand how much time you are spending online and what social networking sites you use.*

1. During the past 6 months, how frequently have you used social networking sites (for example, Facebook, Messenger, Snapchat, Instagram, and Twitter) for things such as browsing, watching videos, posting updates, or texting and chatting with friends? (Select the most appropriate choice.)

- I don't use social networking sites, Almost never,
 A moderate amount, Almost always

Although it is difficult to estimate, approximately, how much time do you spend on social networking sites? []

2. What devices do you use to access social networking sites? (Select all that apply)
- A smartphone, A tablet (for example, iPad, Samsung Galaxy),
 A laptop, A desktop computer, Other[]
3. Which of the following social networking sites have you been active on (for example, browsed through or posted on) in the past 6 months? (Select all that apply)
- Instagram, Twitter, Google+,
 Tumblr, Vine, Facebook, Snapchat, Other[]
4. During the past 6 of months, on average, how frequently have you shared or posted content (for example, photos, videos, articles, opinions, media news) on your social networking accounts for people in your network to see? This includes posting stories on Snapchat, photos and videos on Instagram, status updates on Facebook, or retweeting on Twitter.
- Never, Once every few months, Once a month, Few times a month, Few times a week, Few times a day

Section 2: Friends & Followers *The following questions help us understand whom you interact with through social networking sites.*

5. Think about the social networking sites where you have your own online profile. List below the number of friends or followers you have on your profile (your best guess).
- Facebook [], Twitter [], Snapchat [], Instagram []
6. Of the friends and followers you have on the following social networking sites, how many do you communicate online regularly with?

SNSs	No one	10%	30%	50%	70%	90%	Everyone	Don't have an account
Facebook	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Snapchat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Instagram	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Twitter	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7. Of the friends and followers you have on the following social networking sites, how many have you also met in person?

SNSs	No one	10%	30%	50%	70%	90%	Everyone	Don't have an account
Facebook	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Snapchat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Instagram	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Twitter	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

8. Internet users continue to spend more time on social networking sites than on any other type of site. Observers have noted a range of positive and negative impacts on users' behaviours. Now, think about the last time you used a social networking site to connect with your friend. In order to demonstrate that you have read the instructions, please ignore the items below. Instead, simply click the other option and in the corresponding box, enter the text: I read the instructions.

Facebook [], Twitter [], Snapchat [], Instagram [], Other []

Section 3: Online Concerns & Private Information *The following questions help us understand what you are concerned about and consider as private when using social networking sites.*

9. What information do you have in your social networking profiles such as your Facebook, Instagram, and Twitter?

Full name, Favorite TV shows/ movies, Photos of yourself, Political views, Photos of your friends, Bio (a short description of who you are), Photos of your family, Where you live (city name), Age, Places you've lived, Phone number, Gender, Email address, Birth year, Website, Birthday (year, month, day), School name, Relationship status, Work experiences, Family members, Credit Card Information, Check-ins (places you've visited such as restaurants, cafes, museums).

10. Indicate how concerned you are about people other than your friends seeing the following things online:

Concern levels: Not concerned at all (anyone could see it), Not very concerned, Somewhat concerned, Quite concerned, Extremely concerned (nobody should see it).

- (a) My entire profile on Facebook (or other social networking site).
 (b) Photos and videos that I have posted of myself online.
 (c) Photos and videos I have posted of others online.

- (d) Please select "quite concerned" option.
- (e) Photos or videos that others have posted of me online (and tagged me in).
- (f) Comments to other people that I have posted online.
- (g) Comments to me from other people that are posted online.
- (h) General information about myself (like gender, birth date, hometown).
- (i) Personal information about myself (like my interests, activities, favorite movies, and relationship status).
- (j) Contact information for myself (like my email, home address, and phone number).
- (k) Direct messages between my friends and I.

11. Please rate how private is the following information:

Levels: I'd NEVER share this with anyone, I'd share ONLY with my close friends, I'd share with all my friends, I'd share with all people on my friends list or followers, I'd share with friends of friends. I'd share this with EVERYONE.

Types of Content: Full name, City I live in, Home address, SIN, and medical information, Age, Sexual orientation, Email address, School name, Phone number, Romantic or family issues (for example, crushes, breakups, family dramas), Financial information (for example, credit or debit card number), Account passwords, Phone passwords (to unlock the screen), Political, religious, and other personal point of views on various matters, Photos of myself and family, Nude photos, Favorite TV shows, books and snacks, Favorite places to hang out, Name and identity of friends or people I spend time with, Activities I've participated in

Section 4: Content Sharing *The following questions help us understand your thought processes when posting content on social networking sites.*

12. How important for you are the following factors for determining which social networking site to use?

Levels: Not at all important, Not very important, Somewhat important, Very important, Extremely important

- (a) My expectations of how my friends access and use various social networking sites (e.g., constantly using Snapchat, rarely using Facebook, don't have Twitter).

- (b) Type of the content that I am planning to share with my friends (e.g., text, images, videos, articles, media news, opinions).
 - (c) Sensitivity of the content that I am planning to share with my friends (e.g., mundane content on Snapchat, lifestyle photos on Instagram, media news on Facebook, my romantic troubles via Facebook Messenger).
 - (d) Whether I want my parents, relatives, and/or other adults to see what I post online (e.g., whether my parents are my Facebook friends).
 - (e) How close I am with the people that I intend to share my content with (e.g., close friends on Snapchat, acquaintances on Facebook).
 - (f) What the social networking site allows me to do online (e.g., group chatting, direct messaging, video calls).
 - (g) The urgency of the interaction (e.g., calls for asking for a ride, Facebook Messenger for daily updates).
13. Please rate how much each of the following statements describes your online behaviours:
- Levels: Never true for me, Sometimes true for me, Often true for me, Always true for me
- (a) When I share things online, I hide the meaning so that only my friends can understand what I am saying.
 - (b) For some social networking sites, I have multiple accounts that I use for different purposes (e.g., 2 Instagram accounts).
 - (c) I provide fake or inaccurate personal information online, such as a fake name, address, phone number, and email address.
 - (d) I keep my social networking accounts (e.g., Facebook, Instagram) deactivated when I am not using them, to stay private.
 - (e) Please select "sometimes true for me" option.
 - (f) I delete some comments and messages that I receive online after I read them.
 - (g) I delete some comments and other content that I leave on others' pages some time after I post them.
 - (h) I delete content that I've posted online, if it doesn't gather enough attention.
 - (i) I don't post much information online.
 - (j) I don't share too much about myself online.
 - (k) I don't share something online that I would regret later.
 - (l) I use privacy settings to protect myself online.

- (m) I don't accept requests from online strangers or respond to their messages.
- (n) To share personal matters with friends, I use private modes of communications (such as Facebook Messenger, texting, and calling), rather than sharing the content on my social networking sites.
- (o) My family and friends help with configuring my privacy settings on social networking sites.
- (p) I carefully consider who I share my online content with and the consequences of sharing it.

14. When sharing content on social networking sites, please rate how much you care about each of the following statements:

Levels: Don't care at all, Don't care much, Somewhat care about, Care about, Extremely care about

- (a) The ability to choose what information I share online and what I keep to myself.
- (b) Once I posted my information online, the ability to control who can access that information.
- (c) The ability to control what information about me is shared online by others.
- (d) The ability to browse web pages and say things online without other people being able to track me down or look at my activity history.
- (e) The ability to control how I am perceived online.

15. Please rate how well each statement applies to you when sharing content on a social networking site.

Levels: Never true for me, Sometimes true for me, Often true for me, Always true for me

- (a) I don't believe I have anything to hide.
- (b) I believe I am unlikely to have my privacy invaded online.
- (c) If privacy invasions happen online, I am confident that I can deal with the consequences and stay away from harm.
- (d) I feel like when I am interacting online, I take the necessary precautions to stay safe.
- (e) I do not worry about having my privacy being invaded online by authorities and strangers that I don't know.

- (f) I do not worry about having my privacy being invaded online by my parents and other adults.
- (g) I do not worry about having my privacy being invaded online by my friends/-classmates/other peers.
- (h) If there is no direct influence on my personal life, I do not mind other people accessing my online content.

Section 5: About You *The following questions help us learn about who you are.*

- 16. How old are you? []
- 17. What grade are you in? []
- 18. Which country do you live in? []
- 19. Which city do you live in? []
- 20. Think about your relationships with your peers and rate how much you agree or disagree with each of the following statements:

Levels: ○ Never true for me, ○ Sometimes true for me, ○ Often true for me, ○ Always true for me

- (a) I go along with my friends just to keep them happy.
- (b) I think it's more important to be myself than to fit in with the crowd.
- (c) For me, it's pretty easy for my friends to get me to change my mind.
- (d) I would do something that I knew was wrong just to stay on my friends' good side.
- (e) I hide my true opinion from my friends if I think my friends will make fun of me.
- (f) I wouldn't break the law just because my friends say that they would.
- (g) I change the way I act when I'm with my friends.
- (h) I take more risks when I'm with my friends than I do when I'm alone.
- (i) I say things that I don't really believe because I think it will make my friends like me more.
- (j) I think it's important to stand up for what I believe, even if people might get angry at me for going against the crowd.
- (k) I find it hard to make friends.
- (l) I have a lot of friends.
- (m) I am very hard to like.
- (n) I am popular with other kids my age.

- (o) I feel that I am socially accepted (liked by people).
- (p) I am able to make really close friends.
- (q) I have a close friend that I can share secrets with.
- (r) I wish I had a really close friend to share things with.
- (s) I find it hard to make friends that I can really trust.
- (t) I don't have a friend that is close enough to share really personal thoughts with.

21. What do you identify your gender as?

Male, Female, Transgender, Other [], Prefer not to answer

22. What is the highest level of education that your parents/guardians have?

Less than high school, High school, Some college, Undergraduate degree from a university, Graduate (Master's or PhD), Not sure, Prefer not to answer

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