HUANG, ZIYUE, Ph.D. Do You Regret Using Social Media? Understanding the Role of Dark Side of Social Media in Regret and Discontinuance Behavior. (2019) Directed by Dr. Prashant Palvia. 169 pp.

Social media is designed to support interpersonal communication and collaboration via Internet-based platforms. Despite the popularity of social media technologies, people spent less time on social media sites and their usage patterns changed dramatically in the past several years. This dissertation aims to provide an exploration and explanation of social media users' change of usage patterns. Regret, which is widely investigated in theoretical economics and marketing research to predict behavioral intention, is introduced to predict social media users' discontinuance intention. Regret is hypothesized to be influenced by negative aspects of social media use, including cyberbullying & arguing, misinformation, information overload, misuse, and online social stress. Regret can further influence dissatisfaction and discontinuance intention. In addition, the relationship between negative aspects of social media and regret is moderated by privacy control and tie strength.

The dissertation is composed of three parts which all address the unified theme of understanding the role of dark side of social media in regret and discontinuance behavior. The first part aims to propose and refine the regret model. It includes an interpretive exploration to understand the discontinuance behavior, define regret in social media context, and elicit factors that can influence users' social media regret and discontinuance intention. The results of the first study provide rich insight to social media users' regret experience and discontinuance intention, and they can also provide a guidance of refining the research model. The second part is a positivist survey examining how dark side of

social media influences regret in the presence of different tie strength and privacy control factors, and how regret in turn influences dissatisfaction and discontinuance intention. The third part is a positivist study using secondary data from social network site (i.e., Twitter) to examine the relationship between the dark side of social media (i.e., information overload, cyberbullying) and users' regret experience. The results from this study further validate our research model.

DO YOU REGRET USING SOCIAL MEDIA? UNDERSTANDING THE ROLE

OF DARK SIDE OF SOCIAL MEDIA IN REGRET

AND DISCONTINUANCE BEHAVIOR

by

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A Dissertation Submitted to
the Faculty of The Graduate School at
The University of North Carolina at Greensboro
in Partial Fulfillment
of the Requirements for the Degree
Doctor of Philosophy

Greensboro
2019

Approved by

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APPROVAL PAGE

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CHAPTER I

INTRODUCTION

During the past decade, the rapid proliferation and evolution of social media are attracting the attention of academic and industry researchers (Kane et al., 2014). Social media is defined as forms of electronic communication through which people create online communities to share information, ideas, and personal messages (Merriam-Webster, 2016). Social media sites are so deeply embedded in our daily lives that people rely on them to fulfill a variety of needs, including getting daily critical news, connecting with family and friends, viewing contents created by others, watching shared videos, and so on. Examples of the most popular social media sites in 2017 were Facebook, Twitter, LinkedIn, Google+, YouTube, Pinterest, and Instagram (Maina, 2017). Facebook had 2.07 billion monthly active users worldwide at the end of 2017 (Facebook).

Despite the popularity of social media sites, social media providers have been trapped in difficult situations in the past several years. For example, the users' excitement towards Facebook began to cool down after the peak in 2012, and some of the users have abandoned their accounts since then (Zhang et al., 2015). People are spending less time on social media apps. A survey shows that Instagram saw the biggest year-over-year drop, with usage down 23.7% in the first quarter of 2016 comparing with 2015, and Twitter was down 23.4%, Snapchat 15.7% and Facebook 8% (Taylor, 2016). Recently, more and more huge social media platforms were discontinued (Smarty, 2017), and

Google Plus was shut down after user information was exposed in October 2018. Social media providers have realized this phenomenon and attempted to attract more users by adding new features to their sites. But obviously, these strategies still can't stop users' discontinuance behavior effectively as was expected (Cannarella and Spechler, 2014).

The discontinuance behavior corresponds to the final termination phase in the information systems life cycle, following the adoption and usage phases (Furneaux and Wade, 2010). Despite the prevalence of research to understand the information systems adoption and usage phases, little attention has been paid toward examining the termination stage (Furneaux and Wade, 2011). Information systems discontinuance is defined as the cessation of the use of an information system. The research on this topic is crucial because organizations have already committed extensive investments into the adoption, implementation, and maintenance of an information system (Recker, 2016). Many companies are utilizing social media advertising to target and engage consumers (Tuten, 2008). In terms of individual users, they have typically invested considerable resources on the use of a system and have adapted daily life routines based on their system use (Recker, 2016). Specifically, some social media users have spent substantial time to expand their online network and promote their social status. Thus, social media discontinuance can result in waste of resources for both organizations and individuals.

Several studies have shown that the social media discontinuance behavior was directly or indirectly caused by the negative effects of social media sites, such as information overload and private information disclosure (Maier et al., 2015; Zhang et al., 2015). These negative effects of social media technologies use are considered as the dark

side of social media (D'Arcy et al., 2014). Given that individuals frequently use social media technologies for entertainment, relaxation, or communication, they may not even expect negative outcomes and are unprepared, thus in a way making them even more vulnerable (Ku et al., 2013). In literature, the dark side of social media is an under-explored area of research, and only some research has examined the causes and negative consequences of some specific negative effects from the use of social media. Various deviant behaviors have been observed on social media websites, such as drug use, social surveillance, cyberbullying, narcissism, and addiction (Terafdar et al., 2011; Kefi and Perez, 2018). Although the number of users who are engaged in such activities is relatively small, these behaviors have caused other social media users as well as themselves to feel disappointed, depressive, unsafe, or even scared. These further trigger users' regret to have used the social media platforms. Finally, these users may discontinue the use of social media as a result of the regret.

According to a YouGov Omnibus survey in 2015, more than half of American users have social media regret. People may regret their decision to use social media when anticipating or realizing that social media has had harmful effects and not using social media could have led to better outcomes. Regret, which is an aversive emotional reaction elicited by a discrepancy in the outcome values of chosen versus unchosen actions, is found to be one of the main constructs to predict behavioral intentions in consumer behavioral research (Tsiros and Mittal, 2000; Zeelenberg and Pieters, 2007). In the IS research arena, regret is a relative new construct, and only a few theories on customer regret have been adopted to e-commerce and social media contexts (Liao et al., 2011;

Chang et al., 2014). Previous research has indicated that regret has a negative influence on satisfaction, reuse intention, and switching behaviors (Chang et al., 2014). Therefore, regret is an appropriate construct to mediate the relationship between the dark side of social media and the discontinuance intention. In addition, in the prior consumer behavioral research, the level of regret was shown to be influenced by the availability of information on a forgone outcome, valence of the outcome, and situation-specific characteristics (Tsiros and Mittal, 2000). However, to the best of our knowledge, there is no existing study that identifies the antecedents of social media regret or further relating regret to the dark side of social media.

In addition, since almost all of the dark side of social media are related to the harmful and extensive contents available in online networks, greater privacy protections can limit the contents available to a user and in turn alleviate the negative effects (Kane et al., 2014). Privacy control, which refers to internet users' control over the collected information, is one of the three dimensions of Internet users' information privacy concerns (IUIPC) (Malhotra et al., 2004). Privacy control is especially important in the social media context, because users take high risks in the disclosure of personal information and need more privacy protections (Gross and Acquisti, 2005). Therefore, when the privacy control is higher, social media users who are affected by the dark side of social media may experience a lower level of regret.

Given the above context, this dissertation aims to examine the role of the dark side of social media in influencing regret and the discontinuance decision. The general research questions are:

1) What issues related to the dark side of social media influence users' regret in using social media?

2) What are the moderating variables that may affect the relationship between dark side of social media and regret?

3) How does regret and other factors affect discontinuance intention?

The remainder of this dissertation proceeds as follows. First, we review the literature in the social media discontinuance, the dark side of social media, regret and satisfaction, and the privacy control. Second, the theoretical foundations of the dissertation are described in greater detail, including social network framework, regret model, valence of using social media, and communication privacy management theory. Third, a research model and a set of hypotheses are proposed. Fourth, we conduct qualitative study using interview, quantitative study using survey and secondary data to refine, test, and validate our research model. Finally, a discussion of contributions, implications, limitations, and future research is provided.

CHAPTER II

LITERATURE REVIEW

Social Media Discontinuance

Social media was originally designed to support interpersonal communication and

collaboration via Internet-based platforms. It is a broad term which has been used for

various technologies, such as wikis, blogs, microblogs, social networking sites, and video

sharing sites (Kaplan and Haenlein, 2010). Social media technologies share many

characteristics with prior collaborative technologies, and are developing fast and often

introducing new features during the past decade. To elucidate what is technologically

distinctive about social media technologies, four essential features were identified as

follows (Kane et al., 2014, p279; boyd and Ellison, 2007):

> (1) have a unique user profile that is constructed by the user, by members of their
> network, and by the platform; (2) access digital content through, and protect it
> from, various search mechanisms provided by the platform; (3) can articulate a
> list of other users with whom they share a relational connection; and (4) view and
> traverse their connections and those made by others on the platform.

Social media provides a variety of benefits to organizations and individuals. At

the organizational level, social media offers new opportunities for companies in a wide

range of business sectors and has a strong influence on business activities and

performance. For example, by using user profile information and historical behavioral

data, researchers in companies can identify target users for online advertising (Zhang et al., 2016). Social media tools can also be used for sales promotions, social marketing, social corporate networking, customer relationship development, etc. (Paniagua and Sapena, 2014). At the individual level, social media has transformed the way people interact with each other. It allows people to bypass geographical constraints and create a large set of virtual communities by constructing a public profile and articulating a list of others to share a connection. It supports easy and instant communication, and people can also get real-time news and information from it. Thus, using social media technologies can increase one's general enjoyment, social capital, relationship maintenance, etc. (boyd and Ellison, 2007; McEwan, 2013).

Despite the various benefits derived from using social media, social media providers are often trapped in difficult situations in the past several years. Three huge social media platforms were discontinued in 2016, and some famous platforms, such as Medium and Google Plus, were starting to lay off employees and give parts of their services to other companies (Smarty, 2017). Providers realized this phenomenon and tried to attract more new users and keep old users by developing mobile apps and adding new features. But obviously, these strategies can't stop users' discontinuance behavior effectively as was expected (Cannarella and Spechler, 2014). People are still spending less time on social media apps year over year (AIS, 2016).

The discontinuance intention corresponds to the final termination phase in the information systems life cycle, following the adoption and usage phases (Furneaux and Wade, 2010; see Figure 1). Considerable IS research has sought to understand the

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adoption, implementation, and continuous use of information systems. In contrast, little

attention has been paid toward examining the termination stage of the information

systems life cycle (Furneaux and Wade, 2011). Information systems discontinuance is

defined as the cessation of the use of an information system. After having initially

adopted an information system, a user may either decide to continue to use the system or

to stop using the system. However, in most of the situations, people would not stop using

an information system promptly. They may first decrease their usage frequency and

finally stop using it after some time. In this dissertation, we also consider significant

decrease of usage frequency or time spent in a system to be an approximation of

discontinuance behavior. The research on this topic is important because IS

discontinuance can result in waste of resources and changes in behavior patterns (Recker,

2016).

Figure 1. Information Systems Life Cycle and User Transformation Model
(Maier et al., 2015)
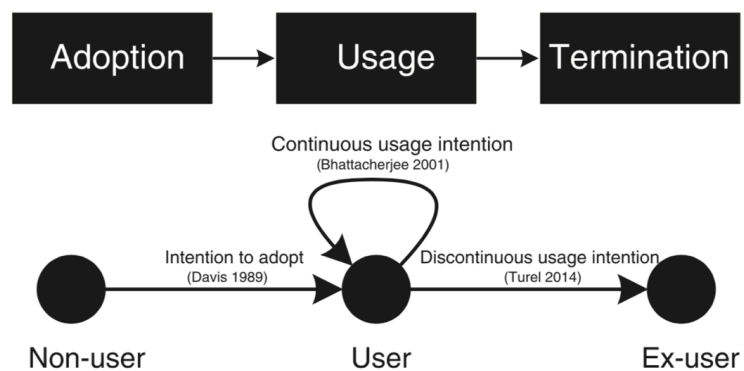
Most of previous research has assumed that IS continuance and discontinuance are the opposite extremes on the same continuum, which offers only limited insight into the end-of-life issues (Turel et al., 2013). A review of continuance research suggests that two approaches are typically adopted (Furneaux and Wade, 2011, p574):

> The first approach views continuance as an extension of acceptance behavior. The models suggest that users' initial perceptions of IS usefulness change because of system use, and these revised perceptions are then posited to drive the decision to use a system in the future (Kim and Malhotra, 2005). The second approach draws on expectation disconfirmation theory to argue that discrepancies between what a user expects of an IS and what it delivers in practice determine future use (Bhattacherjee and Premkumar, 2004).

However, discontinuance intention is a post-continuance behavioral intention that likely emerges only after continuance intentions have been in place (i.e., the person already uses the system and then abandons the use of that system) (Turel, 2015). Therefore, recently, scholars have begun focusing on IS discontinuance as a distinct phenomenon, concluding that IS continuance and discontinuance decisions are driven by different factors (Maier et al., 2015). Furneaux and Wade (2010; 2011) were the first to examine organizational-level decisions to discontinue the use of an information system. They argue that such decisions are influenced by existing system shortcomings, level of integration with other systems, and other organizational and environmental forces. At the individual level, IS discontinuance intention was examined to be influenced by technostress and negative beliefs about system performance (i.e., perceived costs of system compliance, perceived work impediment) (Tarafdar et al., 2011; Recker, 2016). Furthermore, several switching theories and user migration theories focusing on user

switching behavior have revealed some influencing factors. These studies argue that the effort required to switch from one service to another is an important determinant of whether a user develops discontinuance behavior (Maier et al., 2015). Transition costs, sunk costs, security costs, setup costs and continuity costs have been identified as common switching costs (Bhattacherjee & Park, 2013; Xu et al., 2014).

Particularly in social media research, some other factors have been found to influence social media discontinuance behavior (Kapoor et al., 2017; see Table 1). Turel and Serenko (2012) argued the dual effect of enjoyment, suggesting that enjoyment can lead to high engagement as well as bad habits. The reinforcement of a bad habit can result in a strong pathological and maladaptive psychological dependency on the use of social networking websites. In a subsequent study, Turel (2015) used cognitive theory to reveal that guilt feelings, self-efficacy, habit, satisfaction, and addiction can influence hedonic information systems discontinuance intentions. Chang et al. (2014) used push-pull-mooring model of the migration theory to show that dissatisfaction and regret are the main antecedents of social networking sites' push (i.e., leave an origin) intention, and alternative attractiveness and switching costs are the moderating factors. Xu et al. (2014) used the same theory to find that dissatisfaction with current social media system (technical quality, information quality) and community (entertainment value, socialization support, member policy) are the push factors of using social media. Matook et al. (2015) indicated that online social networks can be associated with perceived loneliness, which depends on relationship orientation, self-disclosure, networking ability, and social media active or passive features. Krasnova et al. (2015) used social

comparison theory to investigate the role of envy in reducing cognitive and affective

well-being of a social networking site user. Maier et al. (2015) shown that, while social

networking stress creators (i.e., complexity, uncertainty, invasion, disclosure, pattern, and

social overload) and exhaustion can increase discontinuance intentions, switching stress

creators (i.e., transition costs, sunk costs, and replacement overload) and exhaustion of

alternatives can reduce such intentions. Zhang et al. (2015) examined the role of

perceived overload (in terms of system feature overload, information overload, and social

overload) in influencing users' negative affections of social media including social

fatigue and dissatisfaction, and the effects of such emotions on users' discontinuance

intention.

Overall, previous studies have argued that social media discontinuance are

directly or indirectly caused by the negative outcomes of social media sites. These

negative effects are considered parts of the dark side of social media.

Table 1. Summary of Previous Research on the Social Media Discontinuance

Authors	Context	Theory	Consequences	Corresponding Antecedents
Turel and Serenko (2012)	Social networking websites	Theory of intrinsic motivation	Engagement Use habit Use habit Use habit Addiction	Perceived enjoyment Perceived enjoyment Daily usage duration Usage comprehensiveness Use habit
Turel (2015)	Hedonic IS use	Cognitive theory	Discontinuance intention Self-efficacy, guilt feelings	Self-efficacy to discontinue, guilt feelings, habit of using, satisfaction

|				Addiction to using the site
Chang et al. (2014)	Social networking sites	Migration theory	Switching intention	Regret, dissatisfaction (moderating factors: switching costs, alternative attractiveness)
Xu et al. (2014)	Social networking services	Migration theory	Intention to switch	Dissatisfaction, attraction, switching costs, peer influence
			Dissatisfaction with current SNS	Dissatisfaction with technical quality, information quality, entertainment value, socialization support, member policy
Matook et al. (2015)	Online social networks	Social exchange theory	Social loneliness	Relationship orientation, network ability, OSN features (passive features, active features, broadcasting, direct communication)
Krasnova et al. (2015)	Social networking sites	Social comparison theory	Cognitive well-being, affective well-being, self-enhancement	Envy on an SNS
			Envy on an SNS	Social information consumption
Maier et al. (2015)	Social networking services	Social support theory	Discontinuous usage intention (switch)	SNS-stress creators, SNS-exhaustion, switching-stress creators, switching-exhaustion, alternative theoretical explanation
Zhang et al. (2015)	Social network services	Cognitive fit theory, feature fatigue theory	Discontinuous usage intention	Social network fatigue, dissatisfaction
			Social network fatigue, dissatisfaction	Perceived overload (system feature, information, social overload)

Dark Side of Social Media

The positive effects of social media have received much attention, while the negative impacts and outcomes of social media use is still an under-explored area of research. IS research community is beginning to consider negative effects of IT use as an important area. These effects are often investigated from the user perspective and sprawl across various phenomena with different shades of darkness, which are determined by how destructive they could be to individuals, organizations, and societies (Tarafdar et al., 2013). Scholars have identified five important areas that characterize the dark side of IT use, including IT-usage-related stress, information overload and multitasking, interruptions, addiction, and misuse (D'Arcy et al., 2014). Given that individuals frequently use social media technologies for entertainment, relaxation, or communication, they may not even expect negative outcomes and are unprepared, thus in a way making them even more vulnerable (Ku et al., 2013). The dark side of social media focuses on the negative effects of social media technologies use.

Based on prior literature, we summarize the socially adverse behavioral phenomena of social media by the degree of psychological and physical harm inflicted on individuals (see Figure 2). The most destructive effects are related to the dark web, drug use, guns, and pedophilia (Greenberg, 2014; Cretaz, 2016). We will not focus on these effects since they are rarely experienced on social media platforms in most people's life. The middle level of harmful behaviors includes addiction, cyberbullying, narcissism, and social surveillance (Kefi and Perez, 2018). These behaviors can cause psychological or even physical damage to victims or people who performing the victimizing. The least

harmful phenomena are associated with annoying content, fear of missing out, information overload, loss of privacy, relationship conflict, and social comparison and jealousy (Fox and Moreland, 2015). These phenomena make users feel psychological uncomfortable, such as mild irritation, frustrated, and disappointed.

Figure 2. Dark Side of Social Media
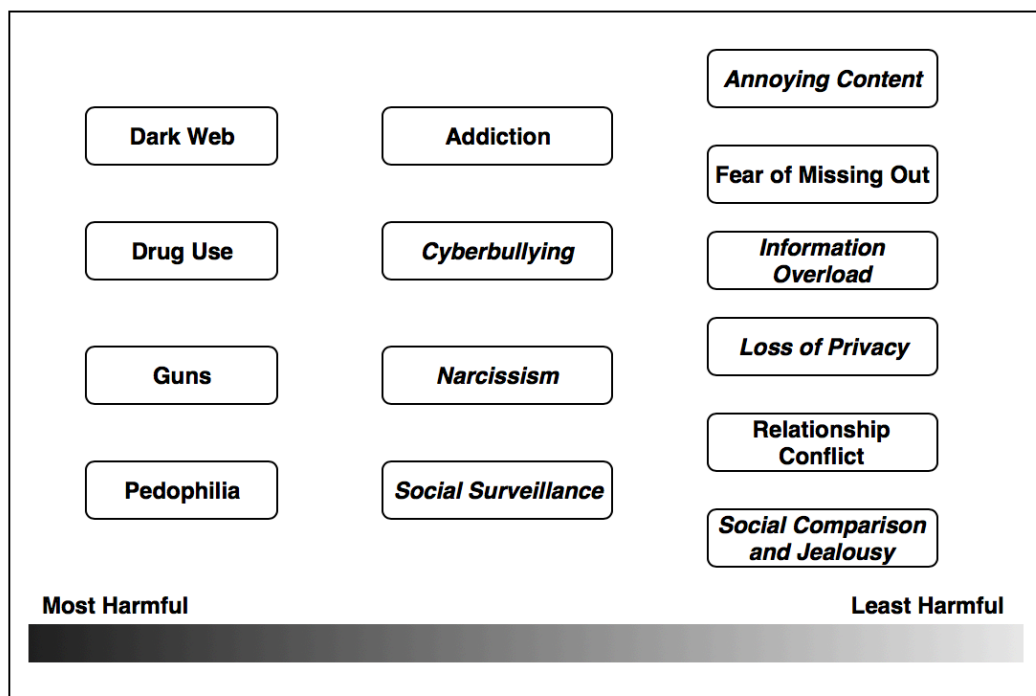
In the dissertation, we categorize users' roles relating to the dark side of social media into two types: the perpetrator and the victim. In this dissertation, we only focus on usage behavior from victims' perspective (e.g., under others' surveillance, cyberbullying victimization, experiencing narcissism of others). Because for most of the situations, the outcomes of victims are more destructive than those of performing the victimizing. For example, there have been multiple cyberbullying cases that ended with the cyberbullying

victims taking their own lives in the past decades (nobullying.com). The victims are the ones who are left to deal with the consequences (Kowalski et al., 2014), thus they may experience higher level of regret than the perpetrators.

We only focus on seven issues of the dark side of social media victimization, three from middle level and four from least level, they are: under social surveillance, cyberbullying victimization, experiencing narcissism of others, information overload, enduring social comparison and jealousy, loss of privacy, and managing annoying content (see Figure 2 in italic). This is because, first, they have become pervasive issues and the most salient phenomena on social media technologies use in general (Kowalski et al., 2014). Second, because based on previous literature (see following paragraphs for details), these dark sides' victimization can potentially increase social media discontinuance intention. Even though some of the negative effects, such as addiction and fear of missing out, are significant phenomena in IS literature, they can't trigger others' regret to have used the social media platforms. Thus, we will not discuss them in the dissertation. In addition, we combine related issues together to introduce them succinctly, as we will describe in the following paragraphs.

Loss of Privacy and Social Surveillance

Social media technologies are designed for users to continually investigate digital traces left by the people in their network. For example, the intended use of Facebook is to "connect and share with the people in your life" by viewing News Feed and user profiles (Marwick, 2012). However, a perceived lack of privacy and control of users' shared information can leave them unable to hide things from their online social network and

even the world. Any attempted strangers can get one's personal information by just searching on the Internet. What's more, people are also concerned with the potential for long-term damage because of social media's pervasiveness and network connectivity. Social media are making people become too transparent without any private space. Therefore, loss of privacy would result in a far-reaching or even devastating outcomes.

A more severe phenomenon could become being under social surveillance. Social surveillance is the use of social media sites to see what friends, family, and acquaintances are "up to" (Joinson, 2008). It is a form of focused, systematic and routine personal information seeking about others, which could stem from the desire to stay updated on what is happening in one's circle of friends (Lee, 2014). Application programming interfaces (APIs) allow any third party to access social media data which may have consequences for users. Depending on the social media sites, some user data can be accessed and harvested automatically and easily with appropriate programs and APIs. Data analysts can use algorithms to deduce the likelihood of thousands of details that one may never disclosed, such as education level, political views, and economic stability (e.g., socialcooling.com by Schep). For example, you may not get that dream job if your Facebook posts aren't positive enough; and if you are a woman you may see fewer ads for high paying jobs. In some way, all social media users are under the surveillance of governments, corporations, and key members of their extended social network, and have high risks to disclose private information to them.

In previous literature, some survey-based research has examined social surveillance experiences based on romantic relationship dissolution. For instance,

attachment anxiety and avoidance are examined as predictors of Facebook-related

jealousy and surveillance (Marshall et al., 2013). Social surveillance is also shown to be

associated with greater current distress over breakups, more negative feelings and sexual

desire, and lower personal growth (Marshall, 2012). Furthermore, the fear of loss of

privacy and social surveillance is leading to a phenomenon called "social cooling" - a

society of increasing social conformity and rigidity, in which people self-censor what

they do online for fear of negative reflections (O'Neill and Donoughue, 2017). Therefore,

users' online activities decrease, and finally they may decide to abandon social media

sites.

Cyberbullying and Annoying Content

Cyberbullying is defined as "willful and repeated harm inflicted through the

medium of electronic text", which occurs between a perpetrator and victim who are

unequal in power (Patchin and Hinduja, 2006, p152). The basic characteristics of

cyberbullying are summarized in previous research, as durability, repeatability,

harassment, disrespect, publicity, the intention of the perpetrator, and the situation that

the victim is defenseless (Hinduja and Patchin, 2008; Kokkinos et al., 2016). There are

four categories of cyberbullying through social media technologies: written or verbal

behaviors which occur with instant messages, voice messages, comments and chats;

visual behaviors by uploading or posting material such as pictures or videos; segregation

by intentionally excluding someone from a group; and impersonation by imitation,

stealing passwords and invading into someone's profile account (Nocentini et al., 2010).

Cyberbullying is a negative experience which not only destroys one's freedom to use and explore valuable online resources, but can also cause severe psychological and physical damage, leading in some cases to suicide (Steinhauer, 2008). Some studies document the outcomes of cyberbullying victimization and/or perpetration, including psychological health (e.g., anxiety and depression, suicidal ideation, low self-control), physical health (e.g., poor physical health, increased likelihood of self-injury), social functioning (e.g., decreased self-esteem and self-worth, loneliness), and behavioral problems (e.g., drug use, impaired performance at school and in the workplace) (Kowalski et al., 2014). In addition, research indicates that the perceptions of cyberbullying differ as the target of the cyberbullying changes. For instance, online aggressive comments directed toward peers were perceived more negatively and less frequently than those targeted toward random people known only online (Whittaker and Kowalski, 2015).

Social media is the most commonly used venue for cyberbullying victimization (Whittaker and Kowalski, 2015). The outcomes of cyberbullying victimization are more destructive than those of cyberbullying perpetration, since they are the ones who are left to deal with the negative outcomes. In the past decade, there have been multiple cyberbullying cases that ended with the cyberbullying victims taking their own lives (nobullying.com). After a social media user receives a cyberbullying message, this encounter creates several possible internal states, such as negative affect and higher anxiety, and the cyberbullying encounter can also influence situational factors, such as a more negative school or work climate. The present internal state is linked with appraisal

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and decision processes, and perceptions of the encounter as stressful and beyond personal control may lead to an impulsive action to drink alcohol or skip school or a more controlled response, such as plotting revenge against the original perpetrator in a face-to-face context (Kowalski et al., 2014). Therefore, cyberbullying victimization may stop users from using social media sites.

In terms of minor negative experiences, an issue emerged concerning users' aggravation with managing annoying content (Fox and Moreland, 2015). Since a common part of social media use is to closely examine posts created by others and looking at one's own contents through other people's comments, these annoying contents can come from continuous negative posts and comments from a sulking friend, and lewd, offensive, or otherwise inappropriate content posted by friends or public accounts. These annoying contents may not trigger those destructive outcomes as cyberbullying, but can still lead to negative affectivity, such as anger, contempt, disgust, fear, and nervousness. In practice, some people said that they were sick and tired of people trying to force their political beliefs upon others, and they found it depressing that people were repeating views they had heard that weren't true (Marsh, 2016). Although social media sites do post rules regarding inappropriate content, there is no clear-cut boundary that exists on how much users should share. Indeed, participants always elaborated their standards regarding what they deemed appropriate self-disclosure, but what was considered acceptable varied between individuals and groups. Thus, norms and expectations for posting contents on social media sites vary considerably (Fox and Anderegg, 2014), which may result in social media discontinuance intention.

Information Overload

Information overload is defined as the situation caused by the amount of information exceeding the capacity an individual can process in a certain unit of time (Jacoby et al. 1974). It occurs when "too much information is provided beyond the user's needs resulting in perceptions of being overwhelmed" (Cenfetelli and Schwarz, 2011). Many studies addressed this phenomenon in the professional sphere, and it was identified as one of the inhibitors of technology usage intentions. This is because information overload can lead to difficulties in requesting relevant information for a system transaction, and result in system fails to meet expectations, thus implying a loss in data processing capabilities and decreasing the individual and organizational performance (Kefi and Perez, 2018). Other effects of information overload include increased mental workload, fatigue, and technostress (Tarafdar et al., 2015; Maier et al., 2015).

The advent of social media has led to a dramatic increase in the amount of information a user is exposed to, greatly increasing the chances of the user experiencing an information overload in the private sphere (Gomez-Rodriguez et al., 2014). The claimed advantages of the massive amounts of information is offering users more resources to use time and exceptional service value proposition. However, a drawback of such information overload can result in users' inability to find reliable information of use at the time of need. For example, surveys show that over half of Twitter users have felt the need for a tool to filter out the irrelevant posts (Bontcheva et al., 2013). In previous research, Jones et al. (2004) identified individual strategies for coping with information overload on large-scale online group discourse. They found that users are more likely to

respond to simpler messages, to end active participation, and to generate simpler responses in overloaded mass interaction. Zhang et al. (2015) investigated information overload on social network services and found that it causes dissatisfaction and subsequently leads to discontinuance behavior. In practice, some people feel that posting on social media was becoming quite frustrating because everyone conformed to the norms - they had to post photos of themselves, and some people merely "like" the photos, then they return the favor (Marsh, 2016). There is less and less communication under each post. Therefore, perceived information overload can decrease users' active participation and efficient responses (i.e., comments on others), and subsequently weaken users' bond with social media technologies.

Narcissism and Social Comparison

Narcissism is defined as an exceptional interest in and admiration of one's own attributes. Self-promotion is a necessary part of interpersonal communication, and the dark side of it comes when it is exaggerated towards the direction of exhibitionism. In social media sites, grandiose narcissists are more frequently found than the other form of narcissism - the vulnerable narcissists, which is associated with insecurity, fragile self-esteem, and social withdrawal. An emergent body of research has documented that social media sites could give users easy access to a large audience and serve as venues for narcissism, caused by uncontrolled tendencies to build a desirable self-image seeking notice and admiration from others (Kefi and Perez, 2018). Studies indicated that narcissism can predict the number of friends, time spent on social media, main photo attractiveness, and self-enhancement (Campbell and McCain, 2017). Furthermore,

narcissism is one of the most significant motives towards the continuous use of social media technologies (Davenport et al., 2014). However, experiencing narcissism of others can make users feel disgusting and be tired of affirming narcissists' grandiosity and popularity. If they don't express admiration toward narcissists, their interpersonal relationships will be broken.

In addition, in terms of minor negative experiences, previous research demonstrated users engage in various manners of social comparison because of others' "show off" posts (Chou and Edge, 2012). The comparison can make users feel disappointed with their own lives. Surveys show that many social media users feel anxious, depressed and like a failure when they see others' flaunting posts (Marsh, 2016). That is because people like to compare their lives to those of their online network friends, which often result in feelings of jealousy or dissatisfaction (Fox and Moreland, 2015). For example, social comparison becomes particularly salient to participants in romantic contexts, wherein they would use social media site's affordances of persistent history and connectivity to self-compare with a romantic interest's potential or former mates (Utz and Beukeboom, 2011). Therefore, experiencing narcissism of others and enduring social comparison can lead to negative affectivities and dissatisfaction with their own lives, and subsequently increase social media discontinuance intention.

Regret and Dissatisfaction

Based on the literature review above, we find dissatisfaction is the main construct that can mediate the relationship between dark side of social media and discontinuance intention (Turel, 2015; Xu et al., 2014; Zhang et al., 2015; Fox and Moreland, 2015). In

addition, regret experience is also found to be one of the primary reasons users are pushed away from a current social media service provider (Chang et al., 2014).

Satisfaction is an important construct in IS research because it is considered as a significant factor in measuring IS success and use (DeLone and McLean, 1992). Satisfaction is confirmed when a consumer's perception of product performance meets the expected standard; otherwise, dissatisfaction occurs (McKinney et al., 2002). The expectancy confirmation theory has been widely adopted to study customer satisfaction and behavioral continuance, which posits that customers' intention to repurchase products or continuous service use is determined primarily by their satisfaction with prior use of the product or service (Oliver, 2010). Lower performance and higher expectation can lead to disconfirmation, dissatisfaction, and finally discontinuance intention (Bhattacherjee, 2001). In our study, we define dissatisfaction as an affective state when a user's perception of actually using social media experience cannot meet the expected standard. Dissatisfaction is a summary of users' past experiences, and it is derived from a value calculation between benefits and risks of using social media (Hu et al., 2015).

Regret is a construct not adequately addressed in IS research arena, but widely studied in theoretical economics and marketing research. Regret means feeling sad, repentant, or disappointed over something that has happened or been done, especially a loss or missed opportunity. It is a negative emotion elicited by identifying a better alternative than the current one, and it varies over time after the decision regarding following actions and self-control (Zeelenberg and Pieters, 2007). Regret theory is a widely-used model in theoretical economics, which proposes that when facing a decision

under uncertainty, individuals might anticipate regret and thus incorporate in their choice

their desire to eliminate this possibility (Loomes and Sugden, 1982). In consumer

behavioral research, the relationship between regret and behavioral intention is

thoroughly investigated. The level of regret was shown to be influenced by the

availability of information/feedback on a forgone outcome, valence of the outcome (a

summation of the positivity and negativity of the different emotions that people

experience to arrive at an overall judgement), and situation-specific characteristics (i.e.,

status quo, reversibility), and finally has an impact on repurchase intentions (Tsiros and

Mittal, 2000). Zeelenberg and Pieters (2004) also indicated that regret was influenced by

failed service encounter and had a positive influence on dissatisfaction and behavioral

responses, such as complaining and switching.

In IS research, regret is a relative new construct, and only few theories pertaining

to consumer regret have been adopted to e-commerce and social media environments.

Liao et al. (2011) examined the roles that information quality, system quality, and service

quality play in determining customer regret and satisfaction, and how they may have an

impact on e-commerce reuse intention. Liao et al. (2017) suggested that confirmation of

expectation, search effort, and alternative attractiveness are predictors of regret, which in

turn influences satisfaction and online shoppers repurchase intention. Chang et al. (2014)

used the regret construct to explain users' intention to switch social networking sites

(SNSs) service providers. SNS users could regret their decisions when realizing that a

different choice would have led to a better outcome. Examples of such better outcome

include stronger informational privacy control, better feature set, higher system quality,

better information quality, and easier to establish relationships with friends. They concluded that regret experience is one of the primary reasons users are pushed away from a current service provider. In our study, we don't focus on switching intention between different social media providers, but on the cessation of the use of the social media technology. Thus, we define regret as a negative emotional reaction to a user's perception of using social media compared with not using social media.

An emergent body of social media research has investigated regret associated with users' posts on a SNS, such as when people would like to erase what they have already posted. For example, Wang et al.'s (2011) survey reveals several possible causes of why users make posts that they later regret, such as unintended audience and underestimated consequences.

Regret and dissatisfaction both represent the consideration toward a result after a comparison process. However, regret is different from dissatisfaction from a psychological perspective (Hung et al., 2007). Tsiros and Mittal (2000) indicated that dissatisfaction focuses on comparisons between actual and expected performance (internal perspective), while regret focuses on comparisons between chosen and forgone outcomes (external perspective). Extant studies show that these two constructs may both be experienced under certain conditions (Tsiros, 1998). What's more, some studies discover regret to be a significant determinant of consumers' dissatisfaction (Zeelenberg and Pieters, 2004; Taylor, 1997). Therefore, regret and dissatisfaction are different but can both influence discontinuance behavior.

Privacy Control

Privacy has increasingly become a determining factor in the use of internet services in recent years. A large amount of previous IS studies have shown that privacy concerns impact users' intentions to disclose and share personal information, to conduct e-commerce transactions, to adopt location-based internet services, to be a member of an online social network, and so on (Acquisti and Gross, 2006; Smith et al., 2011).

Potential privacy risks were identified associated with social media in prior literature, such as stalking, price discrimination, unwanted contacts, and blackmailing (Gross and Acquisti, 2005). Other studies also highlighted more severe situations resulted from excessive sharing of personal data on social media sites, including identity theft, damaged reputations, and use of personal data by third-parties (boyd and Ellison, 2008; Wang et al., 2011). In addition, the ability to access and search content through various mechanisms also raises issues about the ability to protect content from others' access, which lead to the growing significance of privacy risks (Kane et al., 2014).

Since almost all of the dark side of social media are related to the harmful and extensive contents available in online networks, greater privacy protections can limit the contents available to a user and in turn alleviate the negative outcomes (Kane et al., 2014). Strategies to increase privacy protections were identified in the literature. For example, in Lampe et al.'s (2008) study, some users managed their profile by restricting who can see it and removing sensitive content. Raynes-Goldie (2010) found various strategies from Facebook users, including using aliases, deleting wall posts, untagging photos, and creating multiple accounts to circumvent Facebook's default privacy settings.

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Privacy control, which refers to internet users' control over the collected information, is one of the three dimensions of Internet users' information privacy concerns (IUIPC) (Malhotra et al., 2004). The issue of control becomes prominent when a large potential exists for opportunistic behavior. Privacy control is especially important in the social media context, because users take high risks in the disclosure of personal information and need more privacy protections. Several studies have suggested that in reality people want to have the ability to control personal information. For example, Nowak and Phelps (1995) demonstrated that people were less worried about data collection when they are given the choice to opt-out. In our study, privacy control is defined as users' capability granted by the social media platforms to control over the shared information, such as deleting inappropriate posts and managing friends list, with the view of alleviating the negative outcomes (Bauer et al., 2013). For example, Facebook platform has basic privacy options on the sharing of posts, permissions of apps, and profiles, and advanced privacy options such as timeline and tagging (Stokes, 2017).

Communication privacy management theory (or information boundary theory) has been widely used to explain the relationship between information disclosure and privacy in social media (Child et al., 2009). It explains how individuals define boundaries to determine what kind of personal information should be disclosed when and to whom (Petronio, 2002). The boundaries depend on the nature of the information to be shared, the individual's personality, environmental factors, and an interrelated risk-benefit assessment (Karwatzki et al., 2017). Based on this theory, Child et al. (2009) provided three privacy rules for blogging disclosures: permeability (the amount, breadth, and depth

of disclosure), ownership (if co-owners have control to make independent decisions about further disclosure), and linkage (who else should be privy to private information).

Privacy control can influence a user's willingness to contribute content to social media networks (Kane et al., 2014). This is because the willingness depends somewhat on the audience a user believes exists for that content, and privacy control changes the nature and scope of the audience for contributions. For example, stronger privacy control may encourage users to contribute more personal content to social media networks in certain conditions, because they know the content will be viewed by only a small set of others (Joinson, 2008). Krasnova et al. (2010) found that privacy control options on a social networking site greatly mitigate user perceptions of risks associated with disclosing personal information. Gerlach et al. (2015) indicated that user perception of privacy risks has a mediating effect on the relationship between policy monetization and user willingness to share information on online social network. Furthermore, Schreiner and Hess (2015) also found that dissatisfaction with privacy protection is positively related to users' discontinuance intention towards the social media provider.

CHAPTER III

THEORETICAL FOUNDATIONS

Social Network Framework

Researchers often rely on traditional social network analysis when attempting to

understand social media technologies (Kane et al., 2014). In a review of social network

literature, Borgatti and Foster (2003) developed a framework for understanding social

network research according to two axes: explanatory goals (social homogeneity or

performance variation) and explanatory mechanisms (network content or structure). Their

resulting 2*2 framework describes four types of social network research (Kane et al.,

2014, p277; see Table 2):

1)   Environmental shaping: how the network environment exerts a predictable influence on its members.
2)   Contagion: how resources spread through a network and influence nodes.
3)   Structural capital: how particular structures of individuals' relationships benefit or constrain them.
4)   Resource access: how nodes access and benefit from resources available in the network.

Table 2. Social Network Framework (Borgatti and Foster, 2003)

Explanatory Goals	Explanatory Mechanisms		
		Structure	Content
	Social Homogeneity	Environmental shaping	Contagion
	Performance Variation	Structural capital	Resource access

Based on the above framework, the target of the dissertation is to understand social network according to social homogeneity, which addresses how the network environment and resources influence social media users' behavior. Thus, to explain social homogeneity, we should investigate both the content that flows through the networks and the structure of the networks. Content refers to resources available in a network, and structure refers to identifiable patterns of nodes and ties in a network.
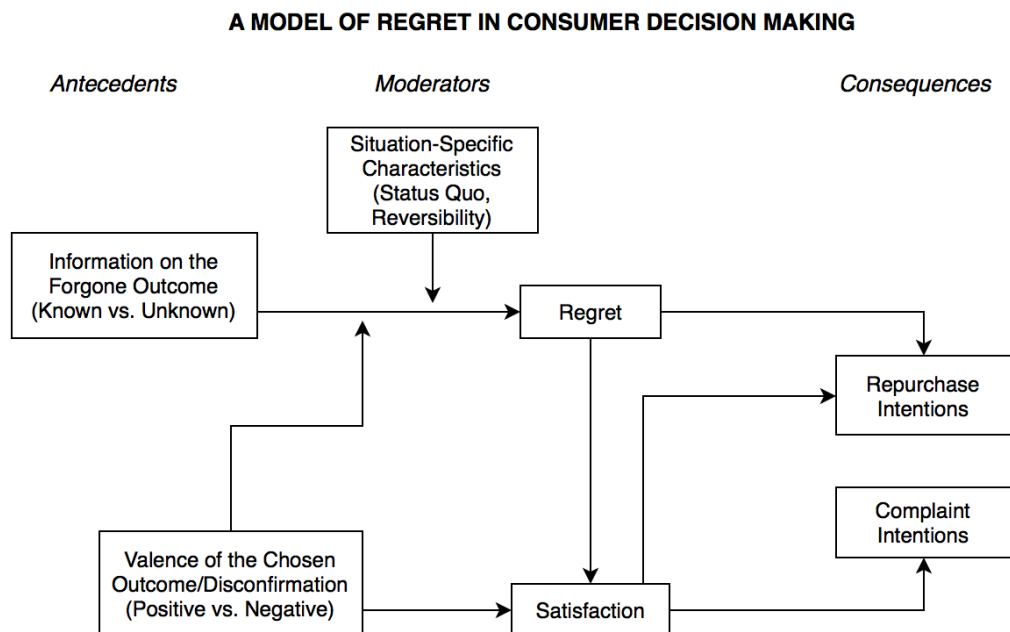
The dark side of social media is related to the contents in a network. Digital relations, which refers to a persistent connection between nodes that enables various types of interaction, are recognized as a type of ties supported by social media platforms. Previous literature has identified four characteristics for digital relations: degree (total number of connections maintained by a node), symmetry (whether both nodes in a dyad reciprocate a tie), affect (whether two nodes like or dislike each other), and strength (the frequency and depth with which two nodes interact) (Kane et al., 2014). In the dissertation, we will focus on tie strength since it is the only characteristic that involves the degree of interactions and relationships of the dark side of social media perpetrators and victims. Tie strength is one of the most commonly used measures in social network analysis, but it is not widely implemented in social media networks (Kane et al., 2014). Weak ties contribute to the diffusion of nonredundant information, mobility opportunity, and social cohesion (Granovetter, 1973). Strong ties are more associated with trust and can lead to more efficient information of known value transfer (March, 1991; Levin and Cross, 2004). Thus, the destructive effects of social media performing between strong ties may be perceived more harmful than those between weak ties, and then lead to a higher

level of disappointed and regret. Consequently, tie strength may moderate the relationship between the dark side of social media and regret.

Regret Model

A model of regret incorporating its antecedents, moderators, and consequences in consumer decision making was proposed by Tsiros and Mittal (2000; see Figure 3). The level of regret was shown to be influenced by the availability of information on a forgone outcome, valence of the outcome, and situation-specific characteristics (i.e., status quo, reversibility), and finally has an impact on satisfaction and repurchase intentions.

Figure 3. Antecedents and Consequences of Regret in Consumer Decision Making (Tsiros and Mittal, 2000)

A MODEL OF REGRET IN CONSUMER DECISION MAKING

Antecedents   *Moderators*   *Consequences*

Situation-Specific Characteristics (Status Quo, Reversibility)

Information on the Forgone Outcome (Known vs. Unknown)

Regret

Repurchase Intentions

Complaint Intentions

Valence of the Chosen Outcome/Disconfirmation (Positive vs. Negative)

Satisfaction

In the regret model, the antecedent of regret is the availability of information on a forgone outcome. Based on the definition, regret is influenced by the comparison

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between what is and what could have been. The knowledge of what could have been or the forgone outcome may not be always available. For example, knowledge of the forgone outcome can be complete in the case of stock investment, while it can be rare in the case of a purchase of a house. Lack of information on a forgone outcome may not often preclude people from making comparisons and experiencing regret. Instead, people undertake counterfactual thinking and construct hypothetical scenarios through mental simulations in the purpose of providing a comparison standard to reality (Kahneman and Tversky, 1982). However, the extremity and the degree of confidence of the counterfactuals are lower than that of an actual forgone outcome. Therefore, the level of regret is higher when information on a better forgone outcome is available than when information is not available.

Some moderators of regret are identified to influence the level of regret in an attempt to make the generation of counterfactuals easier when the information on the foregone outcome is not complete. The ability and motivation to generate counterfactuals is found to be influenced by situation-specific characteristics, and the counterfactuals in turn have an impact on the level of regret. Three situation-specific characteristics are indicated, including status quo, irreversibility of outcome, and valence of the outcome. First, it is shown that changing the status quo (e.g., switch brands) can generate higher level of regret than retaining the status quo. One explanation is based on an information-processing perspective, which reveals that a switch away from the current situation leads to a more salient cognitive and emotional responses. When consumers choose the same brand, they will be less likely to consider other potential outcomes and generate

counterfactuals, thus they will experience lower levels of regret. Second, it is also shown that outcomes that appear to be irreversible (e.g., cannot return the product) can generate more regret than reversible outcomes. That is because the reversible outcomes can make the consumers feel the decision involved lower risk, which cause them to be more passive and prevent them from spending cognitive effort to generate counterfactual. Therefore, reversible outcomes can make consumers be less prone to experiencing regret. Third, the valence of the outcome refers to a summation of the positivity and negativity of the different emotions that people experience to arrive at an overall judgement (Zeelenberg and Pieters, 2004). It is examined that during post-choice valuation, negative outcomes stimulate more counterfactual thinking than positive outcomes. That is because consumers in a positive affective state are more likely to engage in activities to maintain the positive state, whereas those in a negative affective state are prone to take actions to repair it (Isen and Geva, 1987). Consequently, consumers having a negative outcome may be motivated to search for a better alternative and avoid such experience in the future, and thus experience a higher level of regret. What's more, negative emotions are expected to lead to more dissatisfaction, whereas positive emotions are expected to lead to more satisfaction (Zeelenberg and Priters, 2004).

The consequences of regret are satisfaction and repurchase intentions. Satisfaction is confirmed when a consumer's perception of product performance meets the expected standard. Regret and satisfaction are different constructs, since satisfaction focuses on comparisons between actual and expected performance (internal perspective), and regret focuses on comparisons between chosen and forgone outcomes (external perspective)

(Liao et al., 2017). It is shown that higher levels of regret decrease satisfaction (Taylor, 1997). This is because consumers will adjust their level of satisfaction with the chosen outcome depending on how this outcome compares against the forgone outcome. In addition, regret and satisfaction can both influence behavioral intentions. One reason is that performance is evaluated not only depending on whether it meets a predetermined level of expectation (i.e., satisfaction) but also according to alternatives available (i.e., regret). Therefore, regret has a negative influence on repurchase intentions, and satisfaction has a positive influence on repurchase intention.

In the dissertation, we use regret and (dis)satisfaction as the main antecedents of social media discontinuance intention. The antecedent of regret - information on forgone outcome, is indicated by the dark side of social media. We depict that when users experience the dark side of social media, their level of regret will be higher. Two moderating factors from the regret model are also included in our research model. First, reversibility of the outcome can be controlled by the settings and features of social media platforms, thus it can be indicated by privacy control. Second, valence of the chosen outcome can be demonstrated using valence of using social media, as we will describe in the following paragraphs.

Valence of Using Social Media

The valence-based approach is a way to model the role of emotion in explaining consumer satisfaction and future behavioral intention (Martin et al., 2008). As shown in the regret model in last section, valence of the outcome refers to a summation of the positivity and negativity of the different emotions that people experience to arrive at an

overall judgement (Zeelenberg and Pieters, 2004). And the valence of the chosen outcome can in turn influence satisfaction. Bhattacherjee (2001) has depicted that satisfaction is a summary of users' past experiences, and it reflects both utilitarian and hedonic evaluation of using information systems. Wong (2004) has demonstrated that positive emotion is triggered by the provision of a high level of perceived service quality, and thus can be relative to customer satisfaction and positive future behavioral intention. Hu et al. (2015) has shown that social media users' satisfaction is derived from online social value, which is a trade-off calculation of utilitarian and hedonic benefits combined with costs in effort and risk. Effort, which is defined as the amount of time, work, and earnest activity used to participate in online network use, is widely used to explain adoption and continuance usage behavior. It is not related to discontinuance intention since discontinuance is a post-continuance behavioral intention that likely emerges only after continuance intentions have been in place (Turel, 2015). Information risk is the main risk in Hu et al.'s (2015) study, and it has been covered in our dark side of social media literature review. Therefore, we only need to review the benefits of social media for individual use in an attempt to get a knowledge of how users evaluate social media usage.

In previous literature, three main benefits for online social were identified, including hedonic benefits, utilitarian/informational benefits, and social/relational benefits (Hu et al., 2015; Gan and Wang, 2017). Hedonic benefits are derived from the feelings or emotional states experienced while using the technologies, reflecting an affective appreciation of the service activities and performance (Sweeney and Soutar,

2001). People often indulge in interactive experiences using social media to kill time and gain enjoyment and curiosity fulfillment.

Utilitarian benefits refer to functional and instrumental benefits provided by using social media technologies, including enhanced efficiency, convenience, and cost reduction (Mathwick et al., 2001). People can reap utilitarian benefits when they have access to valuable resource contents through their network connections. Since the key resource in social media is digital information created by interpersonal exchange, people who can access more valuable information are more likely to get benefits and experience performance improvements (Kane et al., 2014). For example, some of the informational benefits are derived from searching for information about people and activities, gain knowledge from reading others' postings, shared events, and ideas within their community (Hu et al., 2015).

Social benefits, or in some literature also called relational benefits, refer to the enhancement of the perception of social status and self-esteem derived from using social media technologies (Sweeney and Soutar, 2001; Rintamaki et al., 2006). These benefits are gained through building and maintaining social capital with others, and creating a social sense of belongingness and identity which typically manifest in friendships and group affiliations (Ellemers et al, 1999). Social capital benefit was investigated to be the dominant social benefit of using social media. Social capital represents the resources inherent in an individual's network of relationships which facilitate collective action, including both interpersonal relationships and the resources rooted in the relationships, such as trust and the norm of reciprocity (McFadyen and Cannella Jr, 2004). The

essential features of social media induce creative forms of communication and help discover potential connections, which expand the breadth and depth of social networking. In addition, social capital benefits contain broader sources of opportunities that are otherwise unavailable (Cao et al., 2015). Social capital is a multidimensional concept incorporating three dimensions, including structural, relational, and cognitive dimensions (Nahapiet and Ghoshal, 1998). The structural dimension indicates the overall pattern of connections between people, such as whom you connect with. The relational dimension indicates resources inherent in the social relationship, such as trust, reciprocity, and equality. The cognitive dimension describes a common context which increases understanding among people represented by shared language, codes, and goals (Cao et al., 2015).

Therefore, in this dissertation, we use valence of using social media, which reflects hedonic, utilitarian, and relational evaluation of using social media, to moderate the relationship between the dark side of social media and regret. When users anticipate social media will bring them more benefits, they are more likely to be in a positive affective state, and thus experience a lower level of regret.

Communication Privacy Management Theory (CPM)

Communication privacy management theory (or information boundary theory), which was first developed by Petronio in 1991, is a systematic research theory developed to explain the way people make decisions about revealing and concealing private information. This theory argues that when people disclose private information, they depend on a rule-based management system to manage the limits of what they are willing

to share with others. And the rules are influenced by the perceived benefits and costs of

information disclosure. The five core principles of Petronio's CPM are as follows:

> (1) People believe they own and have a right to control their private information;
> (2) People control their private information through the use of personal privacy
> rules; (3) When others are told or given access to a person's private information,
> they become co-owners of that information; (4) Co-owners of private information
> need to negotiate mutually agreeable privacy rules about telling others; (5) When
> co-owners of private information don't effectively negotiate and follow mutually
> held privacy rules, boundary turbulence is the likely result.

CPM also indicated that co-owners of shared private information should

coordinate the boundaries of privacy based on boundary permeability, boundary linkage,

and boundary ownership. Boundary permeability refers to the nature of the invisible

divisions (e.g., amount, breadth, and depth of disclosure) that keep private information

from being known outside of an individual or particular group. Typically, when people

want more control over private disclosures, they establish boundaries with low

permeability possibilities. For example, bloggers always regulate boundary permeability

by avoiding certain topics (Child et al., 2009). Boundary linkage rules identify how

owners are connected when they build relationships through a boundary. The

coordination process involves how people negotiate the selection of others allowed to be

included in the collective privacy boundary. Boundary ownership refers to the

responsibilities and rights each person has over the control of the spread of information

that they own. When working to mutually create the boundary of privacy, it is crucial for

co-owners to reach a consensus on whether information should be shared, who it should

be shared with, etc.

Sometimes if the boundaries of privacy are not coordinated well, it may lead to a situation know as boundary turbulence. In the event of boundary turbulence, co-owners of information can perceive that their private sphere have been violated and lose trust in others. With the emergence of social media, boundary turbulence can always occur since boundary rules have not been established in this situation. To reduce turbulence, the goal of social media providers is to design good feathers to establish boundaries, while social media users should learn how to coordinate boundaries.

Recent research has started to draw on CPM to investigate privacy management for social media. For example, Jin (2013) indicated the roles of virtual identity discrepancy and personality traits in communication privacy management on Twitter. Karwatzi et al. (2017) discovered how interactions among individuals' privacy valuation, transparency features, and service personalization influence their willingness to disclose information.

In the dissertation, we regulate three dimensions of privacy control based on CPM and the essential features of social media. Permeability control refers to privacy control on which information is shared and with whom. It includes the amount and content of shared information, the audience of shared information, and the change of privacy preferences for shared information over time (Bauer et al., 2013). Ownership control refers to privacy control on the responsibilities and rights regarding the spread of information. Linkage control refers to privacy control on identifying who else (other than current co-owners) should be privy to private information. It coordinates the strength of connection between people in the online virtual community. The linages can be strong or

weak depending on how information was passed and the social network tie features of the

information co-owners.

CHAPTER IV

RESEARCH MODEL

Conceptual Overview

The model presented in this dissertation is founded primarily on Tsiros and Mittal's (2000) regret model. Additionally, we incorporate issues of the dark side of social media from victim's perspective (i.e., social surveillance & loss of privacy, cyberbullying & annoying content, information overload, narcissism & social comparison), communication privacy management theory (i.e., privacy control factors), and social network framework (i.e., tie strength factor) in an attempt to further develop a comprehensive theory of social media discontinuance. Therefore, this dissertation aims to examine how dark side of social media influences regret in the presence of different tie strength, valence, and privacy control factors, and how regret in turn influences dissatisfaction and discontinuance intention. Figure 4 presents the research model. The definitions of central constructs are shown in Table 3.

Figure 4. Research Model
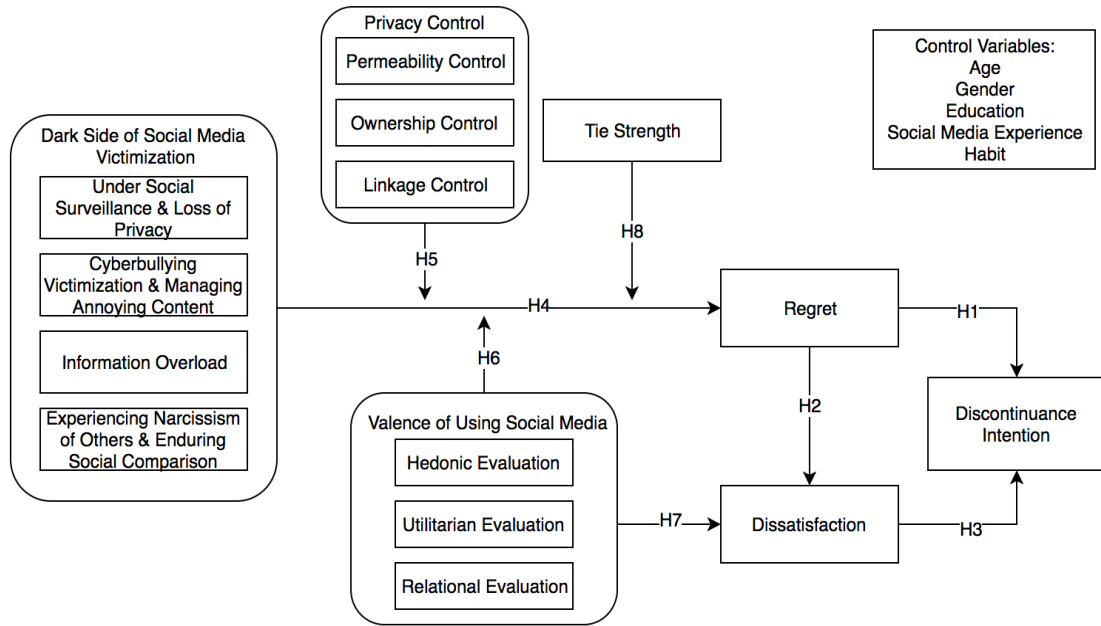
Regret, Dissatisfaction, and Discontinuance Intention

In the research model, we define dissatisfaction as an affective state when a user's perception of actually using social media experience cannot meet the expected standard. We also define regret as a negative emotional reaction to a user's perception of using social media compared with not using social media. Regret and satisfaction are different constructs, since satisfaction focuses on comparisons between actual and expected performance, while regret focuses on comparisons between chosen and forgone outcomes (Liao et al., 2017). In previous regret models, higher levels of regret decrease satisfaction, and regret has a negative influence on repurchase intentions whereas satisfaction has a positive influence on repurchase intention (Tsiros and Mittal, 2000; Chang et al., 2014; Liao et al., 2017).

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The expectancy confirmation theory has been widely adopted to study customer satisfaction and behavioral continuance, which posits that users' intention to continuous service use is determined primarily by their satisfaction with prior use of the service (Oliver, 2010). Dissatisfaction is the opposite side of satisfaction, and some studies use dissatisfaction instead of satisfaction to predict the discontinuance behavior (Chang et al., 2014). Previous research also indicated that regret can influence satisfaction, since users will adjust their level of expectation with the chosen outcome depending on how this outcome compares against the forgone outcome (Taylor, 1997). Furthermore, regret can influence behavioral intentions directly, since performance is evaluated not only depending on whether it meets a predetermined level of expectation but also according to alternatives available. Therefore, the hypotheses on the relationships between regret, dissatisfaction, and discontinuance intention are proposed:

H1: Regret has a positive influence on discontinuance intention.

H2: Regret has a positive influence on dissatisfaction.

H3: Dissatisfaction has a positive influence on discontinuance intention.

Table 3. Definition of Central Constructs

Construct	Definition	Reference
Discontinuance intention	An individual's intention to stop using social media technologies.	Furneaux and Wade, 2011
Regret	A negative emotional reaction to a user's perception of using social media compared with not using social media technologies.	Zeelenberg and Pieters, 2007; Tsiros and Mittal, 2000
Dissatisfaction	An affective state when a user's perception of actually using social	McKinney et al., 2002

	media experience cannot meet the expected standard.	
Dark side of social media	Negative effects of social media technologies use.	D'Arcy et al., 2014
Privacy control	An individual's capability granted by the social media platform to have control over his/her shared information.	Malhotra et al., 2004
Valence using social media	A summation of the positivity and negativity of the different emotions that people experience to arrive at an overall judgement of using social media.	Zeelenberg and Pieters, 2004
Tie strength	The frequency and depth with which two people interact using social media technologies.	Kane et al., 2014
Social surveillance &loss of privacy	Loss of personal information caused by a form of focused, systematic and routine information seeking from others through social media sites.	Lee, 2014
Cyberbullying & annoying content	Willful and repeated harm inflicted through the medium of electronic text, and inappropriate content posted on social media sites.	Patchin and Hinduja, 2006; Fox and Moreland, 2015
Information overload	The amount of information exceeds the capacity an individual can process in a certain unit of time.	Jacoby et al. 1974
Narcissism & social comparison	An individual compares his/her lives to those who have an exceptional interest in and admiration of their own attributes.	Kefi and Perez, 2018; Fox and Moreland, 2015

Dark Side of Social Media and Regret

Regret is influenced by the comparison between the chosen (i.e., using social media) and the forgone (i.e., not using social media) outcome. Information on forgone outcome is indicated by the dark side of social media victimization, since it is the damage

inflicted on users only when they use social media technologies, and the negative outcomes can be easily observed and experienced by users. When people stop using social media technologies, they will not receive any information from social media sites to induce new reaction. However, the knowledge of the forgone outcome may not be always available, as some aspects of the dark side of social media may not be experienced by all users. In the regret model, when information on a better-forgone outcome is available, people will experience more regret than when information on the forgone outcome is not available. Thus, when users experience dark side of social media, their level of regret will be higher.

Regret means feeling sad, repentant, or disappointed over something that has happened or been done. Four salient negative effects of social media use are included in the research model, and they have been shown to have the possibility of increasing social media regret. First, the fear of social surveillance and loss of privacy leads to a phenomenon in which people self-censor or second guess what they do online for fear of negative reflections (O'Neill and Donoughue, 2017). This phenomenon leads to users' online activities to decrease, and they may lose interest in using social media sites.

Second, cyberbullying victimization is a negative experience which not only destroys one's freedom to explore valuable online resources, but also can cause severe psychological and physical damage (Kowalski et al., 2014). The annoying content, which may come from any inappropriate posts and comments from friends or public accounts, can also lead to negative affectivity, such as anger, contempt, disgust, fear, and nervousness (Fox and Moreland, 2015).

Third, information overload was identified as one of the main inhibitors of technology usage intention, since it can result in users' inability to find credible information of use at the time of need (Cenfetelli and Schwarz, 2011). It was also found that to cope with information overload on large-scale online discourse, users are prone to generate less interactions (Jones et al., 2004). Thus, perceived information overload can decrease users' active participation and efficient responses (i.e., comments on others), and subsequently lead to social media regret.

Finally, experiencing narcissism of other people can result in negative emotions (Marsh, 2016). That is because people like to compare their lives to those of their online network friends, which often result in feelings of jealousy, inadequacy or disappointment (Fox and Moreland, 2015).

In this dissertation, the dark side of social media victimization is a broad term with four dimensions. It cannot be considered as a reflective, formative, or aggregate construct. Therefore, we need to develop hypotheses at the dimension level and draw no conclusion about the overall construct (Wong et al., 2008). However, since all the four dimensions of the dark side of social media victimization can increase social media users' regret level, we propose the hypothesis arguing that the dark side of social media victimization can increase social media users' regret level. Consequently, the following hypotheses are proposed:

H4 (a, b, c, d): Dark side of social media victimization (**a.** social surveillance & loss of privacy, **b.** cyberbullying & annoying content, **c.** information overload, **d.** narcissism & social comparison) has a positive influence on regret using social media.

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Moderating Effects

In the research model, three moderating factors are elicited: privacy control, valence of using social media, and tie strength.

Privacy control is defined as users' capability granted by the social media platform to have control over their shared information, with the view of alleviating negative outcomes. It is one of the three dimensions of Internet users' information privacy concerns (IUIPC) (Malhotra et al., 2004). Privacy control is especially important in the social media context, since users take high risks in the disclosure of personal information and need more privacy protections. For example, Nowak and Phelps (1995) demonstrated that people were less worried about data collection when they are given the choice to opt-out. Furthermore, depending on communication privacy management theory, we regulate three dimensions of privacy control (Petronio, 1991). Permeability control refers to the privacy control on which information is shared with whom and when. Ownership control refers to the privacy control on the responsibilities and rights regarding the spread of information. Linkage control means the privacy control on identifying who else (other than current co-owners) should be privy to private information.

In the regret model, reversibility of the outcome was identified as a moderator to influence the relationship between regret and its antecedent. It was recognized that the outcomes that appear to be irreversible can generate more regret than reversible outcomes. On social media platforms, the settings and features (not only privacy settings) can give users capabilities to control over their shared information, such as deleting

inappropriate posts and managing audience list, for the purpose of making the negative

outcomes reversible. Furthermore, privacy control can greatly mitigate users' perceptions

of negative effects associated with disclosing personal information (Krasnova et al.,

2010). It can also eliminate the contents created by others that users don't want to read

(e.g., narcissism of others, cyberbullying) on social media platforms. Therefore, the

following hypothesis is proposed:

H5: Privacy control (i.e., permeability control, ownership control, linkage

control) weakens the relationship between the dark side of social media victimization and

regret using social media technologies.

As shown in the regret model, valence of the outcome refers to a summation of

the positivity and negativity of different emotions that people experience to arrive at an

overall judgement (Zeelenberg and Pieters, 2004). It is a net emotion (positive or

negative) that can moderate the relationship between regret and its antecedent, and it can

also directly influence user satisfaction (Tsiros and Mittal, 2000; Martin et al., 2008;

Wong, 2004).

Previous research has demonstrated that positive emotion is triggered by the

delivery of a high level of perceived service quality, and thus can be relative to customer

satisfaction and positive future behavioral intention (Wong, 2004). Hu et al. (2015) has

shown that social media users' satisfaction is derived from online social value, which is a

trade-off calculation of utilitarian and hedonic benefits combined with costs in effort and

risk. Effort, which is defined as the amount of time, work, and earnest activity used to

participate in online network use, is widely used to explain adoption and continuance

usage behavior. It is not related to discontinuance intention since discontinuance is a post-continuance behavioral intention that likely emerges only after continuance intentions have been in place (Turel, 2015). Information risk is the main risk in Hu et al.'s (2015) study, and it has already been covered in the dark side of social media. Therefore, only benefit dimensions of using social media should be considered in the valence construct.

Since valence of using social media is a summary of users' past experiences, it should reflect hedonic, utilitarian, and relational evaluation of using social media (Bhattacherjee, 2001; Hu et al., 2015). We use the word evaluation instead of benefit because the emotions derived from these three dimensions can be either positive or negative. And even if the emotions are always positive, they can range from low to high. Hedonic evaluation is derived from the emotional states experienced while using social media, reflecting an affective appreciation of the service activities and performance (Sweeney and Soutar, 2001). Utilitarian evaluation refers to one's perception on functional and informational benefits or drawbacks provided by using social media technologies (Mathwick et al., 2001). Relational evaluation refers to the perceived enhancement or setback of social status and self-esteem derived from using social media (Rintamaki et al., 2006). Consequently, the following hypotheses are proposed:

H6: Valence of using social media (based on hedonic, utilitarian, and relational evaluation) weakens the relationship between the dark side of social media victimization and regret using social media technologies.

H7: Valence of using social media (based on hedonic, utilitarian, and relational evaluation) has a negative influence on dissatisfaction. When the valence is higher, people will experience a lower level of dissatisfaction.

Based on Borgatti and Foster's (2003) social network framework, we will also consider how tie strength between the dark side of social media victims and perpetrators may influence regret and discontinuance intention. Previous research indicated that online aggressive comments directed toward peers were perceived more negatively than those targeted toward random people known only online (Whittaker and Kowalski, 2015). Utz and Beukeboom (2011) also recognized that social comparison was particularly salient to social media users in romantic relationships. Thus, tie strength, which refers to the frequency and depth with which two people interact, may moderate the relationship between the dark side of social media and regret (Kane et al., 2014). For example, the cyberbullying and narcissism from one's intimate friends can lead to a higher level of disappointed and regret. Therefore, the following hypothesis is proposed:

H8: Tie strength between victim and perpetrator strengthens the relationship between the dark side of social media victimization and regret using social media technologies. (Under the same level of the dark side of social media victimization, when tie strength is stronger, users will experience a higher level of regret.)

However, tie strength construct is not widely implemented in social media networks, and we cannot find more literature to figure out how tie strength can moderate the effect between each negative issue and regret. Under the dark side of social media victimization broad term, there are two levels of issues: the middle level issues (e.g.,

cyberbullying) are related to negative behaviors that can cause psychological or even physical damage to victims, and the least level issues (e.g., annoying content) are associated with behaviors that make users feel mild psychological uncomfortable. The moderating effect of tie strength between middle level issues and regret may be different from that between least level issues and regret. For example, a social media user may feel more depressed if s/he receives cyberbullying message from his/her friends, since strong tie strength generate trust and their trust is destroyed because of the negative behavior. In contrast, people may feel less annoying if they see inappropriate contents from their friends, or they will be pleasant to share more private contents with their friends. Accordingly, tie strength between victim and perpetrator may weaken the relationship between the least harmful issues of dark side of social media victimization and regret. Therefore, we propose an alternative hypothesis:

H8a: Tie strength between victim and perpetrator weakens the relationship between the dark side of social media victimization and regret using social media technologies. (Under the same level of the dark side of social media victimization, when tie strength is stronger, users will experience a lower level of regret.)

Control Variables

Factors other than those described above may also influence social media users' perception of the dark side of social media and regret level. For example, research has indicated that cyberbullying is more frequent within very young and male populations, and it is also exponentially observed in the workplace with negative job satisfaction (Zhang et al. 2016). If an individual has used social media for a longer time, s/he will be

more likely to be exposed to the negative outcomes of social media and feel regret of using social media technologies. Therefore, to control for those unknown effects, we include four demographic characteristics as control variables: gender, age, education, and social media experience (length*frequency) (Chang et al., 2014; Xu et al., 2014).

In addition, one's habit of using social media platforms is a main inhibitor of discontinuance intention (Turel, 2015). It is because habits drive behavior regardless of cognitive processes, and it would mitigate thinking about the negative consequences of social media use (Turel and Serenko, 2012). Therefore, social media use habit is negatively associated with one's discontinuance intentions, and we will introduce social media use habit as a control variable.

CHAPTER V

QUALITATIVE STUDY

The dissertation is composed of three studies which all address the unified theme of understanding the role of dark side of social media in regret and discontinuance behavior. The first study aims to propose and refine the regret model. It includes an interpretive exploration to understand the discontinuance behavior, define regret in social media context, and elicit factors that can influence users' social media regret and discontinuance intention. The results of the qualitative study provide rich insight to social media users' regret experience and discontinuance intention, and they can also help to formulate the hypotheses and refine the research model.

Social media is a broad term which has been used for various technologies, such as wikis, blogs, social networking sites, gaming sites, and video sharing sites (Kaplan and Haenlein, 2010). We only focus on social networking sites when we collect data. Social networking sites, such as Facebook or Twitter, is the most appropriate type of social media technology for us to study and collect data. This is because the most significant developments connected to social media is the rise of social networking sites. Furthermore, the definition of social media technologies is based on the essential characteristics of social networking sites (Ellison and boyd, 2013).

Problem Statement

Regret means feeling sad, repentant, or disappointed over something that has happened or been done. It is an aversive emotional reaction elicited by a discrepancy in the outcome values of chosen versus unchosen actions (Tsiros and Mittal, 2000). In previous empirical research, regret is always measured by self-report assessments. For example, a five-item unidimensional scale was used to measure regret in health care decisions (e.g., "It was the right decision", "I would go for the same choice if I had to do it over again") (Brehaut, et al., 2003). However, regret is a construct not adequately defined and addressed in IS research arena. In our study, we define regret as a negative emotional reaction to a user's perception of using social media compared with not using social media. We conduct interview to construct a scale to define regret and measure the level of regret in social media use context.

In IS research, regret is a relative new construct, and only few theories on customer regret were adopted to e-commerce studies. For example, Liao et al. (2017) suggested that confirmation of expectation, search effort, and alternative attractiveness are the predictors of regret, which in turn influences satisfaction and online shoppers repurchase intention. To the best of our knowledge, there is only one empirical study that uses the regret construct to explain users' behavior associated with social media use (Chang et al., 2014). They concluded that regret experience was one of the primary reasons users were pushed away from a current service provider. They mentioned a few factors that may explain regret experience, such as informational privacy control, feature set, system quality, information quality, and the way to establish relationships with

friends. However, they did not actually examine them. What's more, their study aimed to explain users' intention to switch social media providers, which is totally different from our goals. Given the lack of rich data concerning regret in social media context, we qualitatively explored definition and antecedents of social media users' regret, and further probed into how they could influence the change of usage behavior. Therefore, we propose research questions for qualitative study as follows:

- How have social media users' usage behavior changed over time?

- What are the factors that influence the change of social media users' usage behavior?

- How to define regret and measure the level of regret in social media use context?

- What issues related to the dark side of social media influence users' regret of using social media?

- What and how other factors can moderate the relationship between the dark side of social media and regret?

Method

To answer the above questions, an interpretive study was conducted using semi-structured interviews. Bettez (2015) argues that to capture the complexity of a researcher's positionality, researchers should be both an insider and outsider for their qualitative research. She states:

> Whereas in early, more positivist-oriented qualitative research, an "objective" outsider status was desired, the move away from a positivist paradigm leads to discussions of the benefits of researcher "insider" status. … Where outsiders have

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the advantage of detachment from the field, an insider must learn to manage the influence of being researcher and the researched. (pp. 937)

For this study, we positioned ourselves as outsiders first. From an objective outsider view, we did literature review on consumer behavior, the dark side of social media, social network analysis, and information privacy. All of these theories are considered to be related to social media discontinuance behavior, and a tentative research model is also proposed. Then, from a subjective insider view, we registered and used social networking platforms (i.e., Facebook and Twitter) for several months, to investigate the dark side of social media and the usage behavior of social media users. When we conducted the interview, we sometimes exchanged our feelings and experiences about the platforms with the respondents. However, for most of the time, we were an outsider to control the whole process of interview, to make sure they could answer our questions in a proper and efficient way.

Our study followed an interpretive paradigm. Even though we started from the literature review, we remained open minded. Because we used a semi-structured interview, we were able to explore some of the novel perceptions mentioned by the interviewees, while still maintaining consistency in the topics that were discussed. To allow each respondent to direct the conversation toward new topics, we started each interview with a broad question asking about their favorite social media platform and continued to ask questions about that platform. For all the questions related to the dark side of social media, we positioned the respondents at the victim's side. The purpose of this study is to understand the discontinuance phenomenon and elicit new constructs and

relationships, and it aims for theory generation rather than theory testing. It is acknowledged that the collected data can be interpreted in different ways based on researchers' knowledge and understanding.

Before collecting large amounts of data through interviews, we pre-tested the interview questions with a panel of four information systems professors. The pre-test was used to ensure the questions were focused on relevant themes and likely to elicit important information. Based on the review by the panel, we organized the questions into three themes and added some new questions pertaining to topics we had not considered.

After pre-testing the interview questions, we conducted four pilot interviews with Ph.D. students to ensure that the questions were understandable and obtained pertinent information. After conducting the pilot interviews, we refined several questions based on their reflections and suggestions. For example, the original question "Can you describe your bad experiences of using social media?" was changed to "Can you describe what kind of posts or comments you don't like?" and "Do you have any concerns while using this platform?". It is because people felt confused when asked about experience, and the new questions can make them talk more about their bad experiences. The final list of questions is shown in Appendix A.

To facilitate the interview process, we also made some observations of relevant social media. We used Facebook, Twitter, and WeChat for two months to get a basic idea of the settings, features, contents, interactions, and relationships of different platforms.

Data Collection

We interviewed twenty-three individuals who are currently using or have used social media technologies (Creswell, 2007). Several recruitment methods were employed to identify participants. We recruited personal contacts and asked respondents for the names of others who have unique social media experience. Recruitment messages were also posted on Craigslist, Nextdoor, and Facebook.

We stopped interviewing more people because when we reviewed the data collected, there was no new ideas or concepts extracted. Based on Grounded Theory method, we can stop collecting data until it reached saturation (Strauss and Corbin, 1990). The participants were selected to represent a diverse set of perspectives. To explore the issues related to discontinuance intention, we interviewed individuals who have experiences of stop using some or all of social media sites, including people who started use social media again at a later time. To explore the factors that can moderate the relationship between the dark side of social media and regret, we also interviewed individuals who are still using social media sites. Furthermore, respondents were selected with different demographic characteristics. Table 4 presents the number of participants for each type.

Table 4. Number of Interview Participants for Each Type

Type of Participants	Group	Number of Participants
Usage Behavior	Stop using some social media sites	16
	Still use social media	7
Gender	Female	12

	Male	11
Age	18-25	6
	26-35	4
	36-45	7
	46-55	3
	Above 55	3
Education	Less than bachelor's degree	8
	Bachelor's degree	4
	More than bachelor's degree	11

Interviews lasted between forty-five to seventy-five minutes. Interviews were conducted in-person or via video conferencing communication tools. The interviews were transcribed by the principle investigator using Google docs voice typing tool. In total, there are 104 pages of interview transcripts.

Results, Analysis, and Interpretation

According to grounded theory method, open coding was first used to determine the emergent, first-level codes in the interview transcripts (Strauss and Corbin, 1990). The codes were achieved by segmenting data into meaningful expressions and summarizing them into words or phrases, and relevant annotations and concepts were then attached to these expressions.

Then, we followed a typological approach to build second-level codes. Hatch (2002) describes typological analysis as "dividing the data set into categories or groups based on the predetermined typologies", and the typologies "are generated from theory, common sense, and/or research objectives" (p. 152). Typological analysis is most

appropriate for our study, since we have already identified relevant theories and

constructs to build our research model, and they can serve as the potential typology of our

qualitative research. After getting the first-level codes, we reviewed the codes, identified

and combined the codes related to our typologies, and added new topics to generate our

second-level codes.

Finally, axial coding was used to determine how the second-level codes related to

form third-level themes. It was also used to determine how the different themes relate to

one another. Dedoose software was used to code and analyze the interview transcripts.

To make the qualitative research trustworthy, our research utilized the validity

criteria proposed by Venkatesh et al. (2013):

> (1) Descriptive validity: the accuracy of what is reported by the researchers; (2)
> interpretive validity: the accuracy of interpreting what is going on in the minds of
> the participants and the degree to which the participants' views, thoughts,
> feelings, intentions, and experiences are accurately understood by the researchers;
> and (3) theoretical validity: the extent to which the theoretical explanation
> developed fits the data and, therefore, is credible and defensible. (p. 34)

For descriptive and interpretive validity, we let the interviewees read our

interview transcripts and corresponding reflection to make sure we understood what they

said and thought accurately. In terms of theoretical validity, all of the second level codes

are searched in information systems literature to find related theories, and the data was

interpreted based on the existing theories. Therefore, our research is rigorous in the

application of methods and the interpretation of data.

Through open coding and typological analysis, thirty-seven first-level codes and

twenty-two second-level codes were identified. Through axial coding, the second-level

codes were grouped into five high level themes. The five themes include: social media

usage behavior (five codes included), behavioral influencer (eight codes), regret and

related reactions (two codes), dark side of social media (five codes), and moderating

factors (two codes). All of the five major themes and corresponding codes are described

briefly, and the frequency with which the major codes occurred across interviews is

provided in the following sections. Examples of the excerpts for each code are also

shown in Tables 6-10. Table 5 presents the major qualitative themes.

Table 5. Major Qualitative Themes

Name of Themes
Social media usage behavior
Behavioral influencers
Regret and related reactions
Dark side of social media
Moderating factors

Social Media Usage Behavior

Throughout the interviews, respondents brought up different social media use

experience and usage patterns. Under this theme, we have codes about general social

media use experience, which includes use sites, favorite site, and activities. We also have

codes about usage patterns, including trend of time spent and change of usage patterns.

For example, we found that all of the respondents have experiences of using

Facebook, more than half of the respondents have used Instagram and Twitter, and most

of the respondents under age 25 have used Snapchat. There are fourteen out of twenty-

three respondents have experiences of stop using some (not all) social media sites. And

among those, some individuals stopped using them for a while and then started using

again. Two of the respondents (in age range 26-45) have totally stopped using all social media sites. In terms of usage patterns, twenty-one out of twenty-three respondents experienced a change in the way they were using social media over time. To summarize, people are becoming more careful when they post personal information on social media sites, and they tend to post or comment less but share and read more. They also have a propensity to delete friends that they don't know well, and they care less about how "online friends" think about them. Only two people under age 25 didn't see any changes in their usage patterns. Further, most of the respondents are spending less time on social media. Table 6 presents the codes and more details about respondents' usage behavior.

Table 6. Codes and Excerpts for Social Media Usage Behavior

Codes	Excerpts
Use sites	Facebook is the first social media site that I used. About 10 years ago, when I was very young. I used Snapchat about 6 years ago, when I was about 13 years old I got one.
	I do use Facebook and Instagram, primarily.
	I have used Instagram, Twitter, Facebook, Snapchat, Pinterest, and YouTube.
Favorite site	My favorite social media site is Facebook.
	I like Instagram, it's easy to post videos and pictures.
	I like to use Snapchat to chat with my friends.
	My favorite site to interact on is probably twitter.
Activities	(On Facebook) Mostly, I would post pictures; occasionally, I share news and articles. I used to play games on there a lot, but I don't anymore.
	I don't really post pictures on Facebook. I post a lot of pictures on Instagram now. I post picture of what I'm doing that day, like you know what the July pictures of fireworks. I might post like, I am

	at Ireland right now until next Monday, so I have been posted a lot pictures of that, just the different things I am seeing.
	I sometimes share some songs and articles on Facebook, just let people know where I stand. I also subscribe some pages like New York times to see the news.
	I love looking at the clever memes and videos that are circulating that week (on Twitter). I also enjoy the funny posts people have and staying updated in my friends' social life.
Trend of time spent	I am spending less time on it.
	I would say my usage of social media definitely increases as I go in travel.
	I would like to use Facebook for about 2-3 hours a day to spend my spare time before. But now I haven't used social media for a long time.
	At first, I spent at least an hour a day because I would play games on Facebook. I was very excited to add friends, build social networks, and play games with my friends. And I used it every day. Now maybe about 15 minutes at most. Even if I get notifications, I may ignore.
	I spent maybe a couple of hours, like 2-3 hours. And I am using it more now, as it has been upgraded a lot.
Change of usage patterns	These factors (it lets people know your every move) have already started to limit my use, and if they continue to update everything, eventually I will get to a point where I no longer want to use the platform.
	The way I use social media sites has been significantly changed since 6 years ago. Now I can perfectly control the use of them. I think the number of people who still posting things on social media is dramatically reduced. I heard a lot of people saying about that. I think it is losing its appeal.
	I used to post a lot. Then I thought that I need more privacy. Once I have a family and get married, I don't feel I should share my life so much. I don't post pictures or anything. I can choose to reply to their private message or not.
	When I first got into Facebook, I was really interested in it. And I was trying to figure out my page, what kind of pictures to post, and trying to post things that people can see them in a best way. Then after a while, I think just like other else, first of all, I found myself spending too much time, and then secondly, I realized that

it was not that important, people spent lots of time looking at others' pictures. So I gradually reduce my usage of it, to like in case of Facebook, I may only post something for some great while. I say maybe two or three times a year. I may respond a little bit more, like to see what I friends are posting, but typically I quickly go through, and when I find myself in certain postings I take a long time to read through because there is a lot of text, unless something that I am really interested in or some topics really close to, I would quickly skip over.

I just posted them randomly when I was younger. When I am older, I started to post things very carefully, like things I am interested in and things are happening. So they were almost like accurate thoughts.

I had over 450 at most, and then I deleted a lot two months ago, now I have around 300 friends.

I don't get that many personal updates anymore from people. Especially my friends use it less and less, that definitely make me use it less and less.

A couple years ago people would say I'm going to the grocery store, and it's like stupid and nobody cares. I don't see it as much anymore. I think it's gotten better.

I have a tendency to throw the political view off. I only share something, and I rarely post status updates. But I very rarely comment or post now.

They used to judge a person based on how many followers they have. And when I was younger, I remember caring about them a lot. If I have more followers, I felt proud of having lots of friends. Then you need to post interesting things to attract more people to follow you. But now I don't care at all.

Behavioral Influencers

Respondents discussed many factors that influenced their social media usage behaviors. Under the behavioral influencers theme, we have eight codes (except regret feelings, which are included in the next section), which are perceived

hedonic/utilitarian/relational benefits, age, gender, social economics status, social media experience, life events, habit, and dissatisfaction and expectation.

There are more than half of the respondents have experiences of stop using some (not all) social media sites. For the people who are still using some social media sites, their perceived benefits play an important role. These benefits fall into the predetermined dimensions of valence (based on hedonic, utilitarian, and relational evaluation) of social media use.

Six demographic variables were found to have effects on usage behavior. Specifically, people in different age have different preferences. For instance, young people use social media as a social platform to attract more followers and build an online network, while older people use it as a means to acquire news and express their opinions. In terms of social economic status, we found people with lower social economic status are less likely to discontinue to use social media, since they feel more empowered by social media and easier to experience self-gratification. Major life events also emerged as an important code in the interviews. A change of life event can influence users' needs and focus, and thus influence their behaviors.

Dissatisfaction was found to be a major influencer of the change of usage behavior. Since dissatisfaction focuses on comparison between actual and expected performance, the expectation code is merged with dissatisfaction. We found people mainly have concerns about the *reliability of social media platforms*, *outdated or poor online network, untrustworthy online friends*, and *inappropriate or irrelevant content*. Table 7 presents the codes and examples of excerpts for behavioral influencer.

Table 7. Codes and Excerpts for Behavioral Influencer

Codes	Excerpts
Benefits (hedonic)	… I have something to do if I'm bored or waiting around for something.
	Instagram is for spend your spare time.
Benefits (utilitarian)	I do believe the social media is a good platform to make people aware of things are going on in the world as far as cultural issues, political issues.
	It's a place where people post news about celebrity, political issues, and people are happy about, and other people comment. Facebook is like a one stop place where people from different parts of the world sharing their countries' news. It keeps me updated with the communities I care.
	I really like that Facebook lets you choose now to, if your friends are interested in going to an event that's happening in your area, and they can say they're interested and then it tells you on the events tab and you can go together.
	I wanted to have it relates to some of the services I use, Spotify for example, you can link your Facebook to that. So if I deleted my Facebook, then I would loss that Spotify subscription, and I have to start over.
	I love using Facebook for as a survey, so I know whenever we had our elections, I just ask you like how many of you like to vote Donald Trump and how many of you like to vote Hilary. Just like to see what majority of my friends would do.
Benefits (relational)	I keep using it to remain in communication with certain people, or just to pass the time by. It doesn't really benefit me in any way other than I don't have to go out of my way to save contacts in my phone.
	LinkedIn is for professional development, I don't post article or anything, but I feel it is important for my career.
	What remains valuable for Facebook is not going to be the photos but the communications, I mean as a communication channel, that's really important.
	Facebook is good for keep track of your friends,

Age	Because we are growing up, and we are realizing there are more important things in our life, our real in person friends and those relationships versus online.
	Because I am growing up, I don't feel the need to share much detail of myself, and to rely on online network to live.
	When I was young, I may not as self-dependent. As I am older, I become more independent. And I may be less likely to use those.
	As age grows, I am not very interested in the contents in Facebook.
	Most students or younger people are using Instagram and get off from Facebook, and they use Facebook because their parents are using Facebook.
	I think young people use social media as a social platform to stay connected with their friends, and older people use social media as a means to spell out their opinion. It's more about sharing what's wrong with the world in their mind.
Gender	I've noticed that women can talk a lot more than men. So I think social network are more way important for women than men. I have guy friends, but I just call them up to meet. We don't like taking pictures.
	I think social media for women is more important. I think all are related to social unacceptable, even though they have their social network, there will be social stigma attached to men complaining. So they don't actually get the benefit the same way as women.
Social economic status	I am in a position that I don't need social network. If I have a bachelor's degree, maybe I need a social network, because I may need to have jobs and to know people. It's also related to job security. I already have a tenure-track job.
	I think people with lower social economics status feel more empowered by social media than those of higher social economics status. People is more driven by those people that are marginalized by the system than those are not. It makes them feel more important. If you don't have a lot of money, then you are marginalized by the society.
Social media experience	Facebook used to be very interesting when you started using it, but after some time you lose the thrill.
	I stopped using Facebook because I felt there were less and less comments under my posts. It made me feel boring after a while.
	As time goes on, people are don't really on it.

Life events	I didn't go on the social media sites for a period of time just because at the time in my life, I was not very social.
	I used to have more free time and consequently use social media more often due to having nothing better to do, but now in college, there's always something to work on that takes precedence over social media.
	I was working a full-time job and took care of my two kids, and my focus was there. I just forgot about Facebook. And there is no motivation and reason to use social media.
	At first, I use social media to keep in contact with my family members, so I use it to keep them updated about how my kids were. But for a lot of times, we can get together as many people as possible over the year on a regular basis, so there wasn't too much need for social media.
	When you are in high school or college time, I think people going through this point of life when they trying to build their network. So they want to know as many as people. I think it's a phase of people's life, like a developmental phase.
	I have used WeChat when I was visiting China. But after I went back to US, I stop using it because there was not many traffic.
Habit	I don't have a regular habit of using social media sites.
	If I'm on Facebook it's more like a muscle memory thing than an intentional thing. So like I pick up my phone and go to Facebook without even thinking about it.
Dissatisfaction & Expectation	There are some changes that the creators make try and force you to make more connections, which I don't always want. They change the way things are posted to your page, things are not in chronological order anymore, and it lets people know your every move.
	I think I would better utilize my time to generate value than allocating my time to other people and wait them to generate value for me. I think in a network if you have more trust, more people would like to invest. However, there is always a chance that they may not have good intentions. (Trust)
	If they see I support their enemy, they may consider me as their enemy as well, which can destroy our friendship. So I will only express my opinion to people that I trust, to those who have that maturity to understand. I don't trust all the people on Facebook to be mature enough to have the same attitude that I have.

I don't trust the people on social media sites, and the privacy policies of those platforms are not reliable as well.

The benefit of the network is not addressed. Because not everyone gets a great network, if you don't have great skills, you will have bad networks.

I stopped using Facebook after I got hacked and just didn't feel safe there anymore.

It's difficult to update my fairly old network on Facebook. I don't like that if I want to delete 30 friends, I need go in and click 30 times to delete them.

I wish Facebook would clean up their network a little bit, like put the ads and make it more organized. And I know they have privacy problems recently.

I think for Facebook, they should probably cut off comments for anything other than personal stories. When you read newspaper in your real life, you won't argue with people around you about how you think of this news.

I wish to see a version of Facebook where people cannot share things.

I wish sometimes if those platforms have new updates, they should have a smooth transition for the new features.

If there is a way they can put an algorithm if there was a type of speech you really don't like, such as some political topics, and you can just block those political stuff.

I expect social media to connect me with friends and family and show me ads that are most relevant to me. I expect them to filter out the things that are inappropriate and show me the things I am most interested in.

Regret and Related Reactions

Respondents who had a big change in the way of using social media spoke frequently about their negative feelings and their reactions to get rid of the negative outcomes. To define regret and measure the level of regret in social media context, there are two codes under this theme, which are regret feeling and regret reaction.

All of the respondents have a variety of negative feelings. Other than regret, some of them provided a description of their negative feelings, such as: embarrassed, unpleasant, disappointing, annoying, and frustrated. And their negative feelings may last for a long time. Since regret is defined as a negative emotional reaction to a user's perception of using social media compared with not using social media technologies, all these negative feelings can be considered as regret feeling if they made people take actions to be free of the unwanted consequences.

Regret reactions have different degrees, ranging from deactivating the account, leaving for a while, unfriend, deleting contents, to ignoring all. Accordingly, the level of regret can be measured by *types, time length of negative feelings* and *degrees of reactions*.

In addition, we found people feel more regret if they were hurt by others than hurting others, because everybody believed their intentions were always good. Even sometimes people did hurt others accidentally, they would be even hurt more by others' extreme reactions.

Table 8. Codes and Excerpts for Regret and Related Reactions

Codes	Excerpts
Regret feeling	I feel embarrassed/unpleasant/frustrated.
	It's just distracting.
	I am often annoyed by things…
	I feel I won't need that anymore.
	It destroyed my mood at that moment.

	It seems like they have a hard time keeping things applicable to me. I regret even getting on Facebook regularly. It is not a very good use of my time.
	I got blackmailed and it was just really scary to see how easy this is in the internet.
	It is just disappointing to me and upsets me when I see that stuff.
	I hate that I am a part of something that today is used to validate who someone is as a person.
	When a close family friend responded negatively to one of my posts, I was very hurt and angry for weeks and lost sleep over it.
	It's more than just regret. Maybe I just don't want be shamed, or just don't want be subject to all the social pressures.
	I think when I was younger, I posted way too much and it was stupid. When I was looking back at them, why I would post this and why I should make it for everyone to see. When I first got my account I felt like I had to post all the time, and as of now I don't feel like I have to anymore.
	I just feel I should not spend too much time on it. I feel bad if some not so close friends post some offensive things. I was not against Facebook itself, I was just against the person who use it with bad intention.
	It's difficult to know if you hurt somebody. Maybe I hurt someone, but I am not aware of.
	I feel worse when I am hurt on social media because my intention is to never be malicious towards somebody else, but instead educate them. Sometimes people maliciously attack me which I feel is immature and regressive.
Regret reaction	How you use it, whether good or bad, is entirely up to you. I created my Twitter account back in high school and deleted it by the time I was out of college. Its seriously so easy to not let social media dictate your life.
	I have tried to freeze my account.
	I just didn't go on the sites for that period of time.
	I regretted using social media for a while, and deleted everything so the hacker couldn't contact me anymore. After that, I downloaded everything again, used different names and put my accounts on private.

> At time if I don't want to be reached, I would deactivate my account. After a period of time, I feel OK and I activate that again.
>
> If I find out the content they post are very offensive, then I don't mind losing their network. So I unfriend or block them sometimes.
>
> I would snooze them for one month. You can also unfollow a person, and hide one's share from a page or a person.
>
> If I say something private, like I feel angry with somebody, I would delete it in one hour or one day. Or if I see somebody posted something stupid under my share, I will remove my share totally or just delete that person's comment.
>
> When I realize the conversation is not productive or constructive anymore, I will just stop responding. Then I will turn off the notifications for that post.
>
> I may come across with something I don't agree with, then I will just read through it and won't comment on it, because that's just what they believe. I won't unfollow people like this, that won't stop us to be Facebook friends, because there may be other things we like in common.

Dark Side of Social Media

Throughout the interviews, we put respondents at the victim's side. They discussed many situations that made them have regret feelings. While some of the situations fell into the predetermined typology of the dark side of social media, many of them did not fit very well. We refer to an existing broader typology on the dark side of IT use, which characterizes the dark side of IT use into five important areas: IT-usage-related stress (or technostress), information overload, multitasking, addiction, and misuse (D'Arcy et al., 2014). Among those areas, multitasking and addiction are irrelevant to the social media regret feeling and change of usage patterns. Accordingly, we identified three issues about the dark side of social media, which are online social stress, misuse, and information overload. We define online social stress as the stress caused by the inability

to adapt to or deal with social media in a healthy manner (Tarafdar et al., 2007). Social media misuse is defined as the unauthorized and deliberate misuse of the information of social media by individuals or organizations (Straub, 1990, p.257), and it has been considered as a security threat. Information overload has been defined and investigated in the dark side of social media literature. Some other issues also emerged from the interviews.

Consequently, under this theme, we have five codes on the issues of dark side of social media, which are: cyberbullying & arguing, misinformation, information overload, misuse, and online social stress.

1) Only a few respondents had been bullied on social media, but almost all the respondents had argued with others about some topics in an angry way. Cyberbullying can make people feel frustrated and they can become anti-social, and arguing can ruin people's relationships.

   Inappropriate contents are the posts or messages that are considered to be not suitable to appear on social media sites and can make people feel uncomfortable. Based on general definition of cyberbullying, inappropriate contents such as sending sexually explicit pictures and sharing others' secrets are also considered as cyberbullying (Kokkinos et al., 2016).

2) Misinformation is false or inaccurate information that is spread intentionally or without realizing it is untrue. It's difficult for people to differentiate between fake news, real news, or opinion news on social media. Social media empowers people to develop fault scenarios about their own intelligence, and some people even

intend to spread fearmongering posts to reach their malicious goals. What's more, in the situation of "echo chamber" (Barbera et al., 2015), most popular posts would become ridiculously abundant and agreed with without much discussion of other opinions.

3) Information overload is defined in the literature review section, and it is related to the amount of information. Respondents feel disappointed when they see too much redundant and irrelevant information flooding their pages, and it makes them difficult to find the information they are interested in. For example, there are a lot of sharing things, advertisements, and people who post every minute of the day.

4) Social media misuse is about the loss of privacy, social surveillance, and any other unauthorized use of the information of social media. All the respondents are aware of the privacy and security issues of social media use, and they are worried about others may use their information to do something against them. It makes people scary if they get blackmailed or their accounts are hacked.

5) Online social stress is the pressure caused by the use of social media. Four dimensions of stress emerged from the interviews, including conformity, narcissism and social comparison, misinterpretation, and discrimination.

- In terms of conformity, since everybody on social media is under the evaluation of other users, people feel the pressure to comply with their online communities' conventions. Otherwise they would feel bad as they would not get reciprocal interactions from their network.

- The pressure can also come from narcissism and social comparison, in which people see others are doing better and better things and have a higher expectation in their own life. Narcissism, which is defined as an exceptional interest in and admiration of one's own attributes, is already discussed in the literature review section. People feel very upset if they see others putting themselves on a higher pedestal, and doing things such as bragging, showing off, and saying extreme words.

- Literal expressions are sometimes difficult to understand accurately, which may lead to misunderstanding and embarrassing situations.

- Stress also arises from social status discrimination or racial discrimination. For example, people are considered more important and popular if they have more online followers or friends. And if you are not an influencer, no one may care about what you say.

Table 9. Codes and Excerpts for Dark Side of Social Media

Codes	Excerpts
Cyberbullying & arguing	The main reason I take breaks from social media is exasperation with cyberbullying, and seeing cyberbullying has frustrated me plenty of times enough to log out of my app for a bit.
	When I was in high school, I was bullied, and that translated over to social media sites. Back in the day, I really let the comments get to me and became very anti-social and really began to focus on me.
	Some people like to swear or say something insulting, may not insulting me but insulting other things.

	I would get into those arguments on social media that can gets you in trouble, and you just typing paragraphs to people, arguing and debating.
	I don't agree with people who just completely bash, like people who affiliated with a certain political party, could completely dismiss their ideas and call them stupid or anything, because their spirit opinion they are not agree with.
	Disagreeing with a famous actor often leads to the less popular person being attacked by that actor's fans.
	I did see people can use social media for unhealthy reasons, so I just be more careful about it. For example, making fun of women, and some sexually contents.
	There was one person who was also posting something very offensive or profanity, who was making cruel and sexual nature images.
	There have been male friends who liked to post new pictures of women in bikinis.
	I unfollowed one of my friends because they posted overly affectionate pictures with their spouses.
	I would be sent spam.
Misinformation	They have been criticized for spreading so-called fake news and misinformation. I cannot differentiate from fake news, real news, or opinion news on Facebook.
	What I dislike most about many social media sites is how they can turn into an "echo chamber," in which the most popular posts or people become ridiculously abundant and agreed with without much discussion of other opinions. This may increase political and social polarization and extremism.
	You should don't be alarm by words you don't understand or people who want to scare you on Facebook, because they may be just bored, ignorant, or both. People don't educate themselves, they may just read some pieces of information or the headline of an article to jump to conclusion without any background or knowledge expertise. Then they may disperse this information out to all their friends which creates echo chamber.
	What they can see in their social network is a reflection of their own belief, and that reinforces their belief, which exacerbate this problem.

	Social media allows people think they are smarter than they are. It empowers people to develop fault scenarios about their own intelligence. They develop a faulty world of view based on their shorty science and total conjecture.
	Qualifications have been traded in for popularity, and it's given a microphone to a ton of dumb people. Smart people tend to be quiet and more unsure of themselves. Social media definitely amplifies the Dunning-Kruger effect.
	They've found that people are a lot more susceptible to advertising when they're emotional, sad, upset, scared, angry, etc. So, these fearmongering posts get people upset, and more likely to buy whatever dumbass thing they're trying to sell you.
Information overload	There is quite a bit information out there. That's mostly because a lot of people on social media seems like every minute of the day keep posting something. They are flooding my page with a bunch of food pictures and recipes.
	There were some people who were really annoying because their posts were dominating, and I could not get to the people I am really interested in.
	Overloading from the pages I follow, not from my friends. Sometimes I would unfollow the pages I liked, because the information they share are not innovative and interesting anymore for me.
	If somebody share videos, I will not like then. Because videos take time, and they are normally public, they don't attract me.
	There are a lot of sharing things, that's crazy. It's more difficult to get some new information now. Facebook has made it as easy as possible, and as lazy as possible to share content. And people don't have to interpret things in their own words any more.
	There are certain periods that you hear same information over and over again, but there are different perspectives and phrased in different ways. I turned to only skim through the feed I get, until something really caught my eyes.
	Sometimes people posted about their dating, they are in hospital with a new born baby, and everything on Facebook, it's good to see those, but I just think they are too personal, and there is no need to post things like that.
	I really hate the advertisements. I think it is a waste of space, I don't go on Facebook to see what the new things somebody else

	is buying, or what everybody else is having and maybe the trending around the world. And in the ads, there are mostly expensive items, so it's irrelevant to me.
Misuse	One of my friends got his Facebook account hacked and he had to delete his and made a new one.
	I would say cybersecurity is definitely an issue. I am aware that post away you are going out of town is risky.
	It's scary at times. I remember I needed to go to my friend's house for something, and I forgot their address. I just Google their name and their house address came up.
	As I look back, I see why I lost my security by sacrificing privacy. Privacy and security are interrelated, you give up your information, you lose your security. Like a bank can use your information to give you different mortgage rates and do other things you don't know.
	I have been a victim that the data of Facebook has been sold to third parties. I would worry more if they use the information to do something against me.
	It bothers me that when you search me for something on Google, but somehow Google tells Facebook what's you search for, and Facebook shows you picture of things that you might want buy. They don't make easy how it works, it's hard to understand how the privacy works in it.
	Once you post your personal life online for other people to comment on, it's not personal anymore, it's public. When I see people get offended for people commenting on what's going on in their life, I question why they post it and let other people know what's going on. So the best way is don't tell them.
Online social stress (Conformity)	People force conforming and you can't really say anything goes to you that makes you like bad person. You should say something that are in line with the most people.
	If you post a picture of your baby, you may get 200 likes, and if you post you have read an interesting book, you may only get 1 like at most. It means they want you to post same things. You will have the pressure to be one of them.
	I have this propaganda as being threat. Just if you agreed with this, agreed, if you don't agree, then you cannot even say anything. Then you are not friends anymore.

	Just like when we are sitting here, if you say something I don't like, I can just walk out of here. But Facebook you are putting all information, and you are giving other person power to evaluate you.
	Availability stresses us out.
(Narcissism and Social Comparison)	Because they might think, these people are doing better and better things, but they are actually not doing. It's illusion, so people's expectations of what's reality is being shifted, and I think it's maybe unhealthy for them.
	I honestly think that without social media, I wouldn't have so much anxiety and depression. What causes it for me is the constant pressure to perform in a certain way while you are always comparing yourself to others.
	The person in the better position popularity-wise is allowed to have a more inflated ego and put down others due to their elevated status.
	It's more like an unrealistic competition. It's like an embarrassed built among people you know and people who know you.
	I just feel they shouldn't brag because other people may don't have it, and that's just mean of spiteful.
	What you see a lot on social media is a curated feed where people see what people want them to see. So people end up comparing their lives to other people's highlight reels.
	People are more likely to comment and say extreme words online, because people are technically anonymous. But they would never say these things in public. I think the level of corium is way lower than what happens in real life. Is that people's real life, thoughts, and belief?
(Misinterpretation)	When I say something really honest, and just blunt not even in the way, they take it as a very mean thing, and they don't think that I might be saying that in a different tone entirely, in a nice way.
	Anytime you talk to people on Facebook, they think you have a motive on some sort of. I don't understand if you say "hello" to somebody, they may think you want an interesting dating or something. I think people are actually more sensitive to their reactions.

(Discrimination)	Since I am not an influencer, no one care what I am posting on Twitter.
	Generally, the more likes and followers you have determines your social media credibility. For example, I have a little less than 500 followers on Instagram. Some would argue that I may not have many friends or am not 'popular', when in fact I just have no desire to be 'friends' or entertain absolute strangers over the internet.
	There was a police officer who arrested his daughter's boyfriend, and I was reading through the comments of people about the young white girl and black boy, a lot of people was saying that they need a date within their own race. I comment that they are teaching their children to hate, to promote hate. I think it is ridiculous.

Moderating Factors

All respondents agree that appropriate privacy control can mitigate negative feelings and effects caused by the dark side of social media. Fortunately, we found the communication privacy management theory to be a perfect typology to identify the codes related to privacy control. Based on the literature review, we identified three dimensions of privacy control (Petronio, 1991).

1) Permeability control refers to privacy control on which information is shared and with whom. Once information is shared to more people on social media, the boundaries for that private information expand and become more permeable. Social media users always manage boundary permeability by avoiding posting certain topics. They can also use content filters to protect themselves from seeing others' malicious messages.

2) Ownership control refers to privacy control on the responsibilities and rights regarding the spread of information. A simple example of this is once you have commented on somebody else's posts on Facebook, you can move and control their posts on your page, and the original people lose their control over the spread of information. That's why people say, "once it's online, it's on there forever". However, some social media sites, such as Snapchat, make everything temporary and endow the users with more ownership control.

3) Linkage control refers to privacy control on identifying who else (other than current co-owners) should be privy to private information. It deals with how owners are connected when they build relationships through an information boundary. For example, the link between a social media user and a stranger intend to surveil the user is weak because the two are not coordinated on how information will be maintained private. Social media users can classify online friends into groups, so that they are able to manage the sharing of information based on different groups. Sharing information only in close friends' group may reduce negative outcomes. Furthermore, unfollowing, defriending, and blocking features can help people get rid of the negative effects of social media.

Tie strength, which refers to the frequency and depth with which two people interact, was also found to moderate the relationship between the dark side of social media and regret throughout the interviews. The relationship between the people who perform bad behaviors and the victims can alleviate or aggravate the victims' regret feelings and reactions. For very harmful behaviors with bad intentions, people endure

deeper degree of regret feelings if it is from closer friends because they expect trust and respect from friends. For mild harmful behaviors made unintentionally, people have higher tolerance towards their close friends. They prefer to show more care and have additional interactions before they unfollow their close friends, or they just ignore their bad behaviors. However, for not so close friends or strangers who perform bad behaviors, people's reaction is to defriend them and move on.

Table 10. Codes and Excerpts for Moderating Factors

Codes	Excerpts
Privacy control (Permeability)	I would never post personal things online, like where I am going today. I may choose to post them afterwards.
	It's as simple as clicking a button that will filter certain content that you do or don't want on your profile.
	In Facebook, there is so many notices coming to me. I don't want to see lots of notices like who likes others' posts, who replies to whom, those are irrelevant to me. Maybe there is a way to close irrelevant notices, but it's not so easy to do that, I just don't have the time and energy to find out how to do it.
	I don't like that whenever you look at somebody's profile if you're trying to look to hire somebody or just want to see someone's skills, LinkedIn tell that person that you looked at their profile.
	There do have a new feature where they have different articles on Snapchat, but you can avoid those if you want, like it's easy to not look at them if you don't want to. It's kind of separated from like when you're looking at things that your friends post.
(Linkage)	Because they are my very close friends, they know what I like, and we have similar interests. So there is not so many negative things on Snapchat compared with Facebook.
	Unfollowing, defriending, and blocking features can help me to get rid of the negative effects of social media.
	Facebook can group people, and limit or edit their accessibility.

	I have two or three groups in which I have different levels of viewing. Especially for family and close friends, if they post something, they rise to the top. So I see them first before going down to others.
	I used to change my settings like who can see what. I have tried to limit a lot of my contents, like to control who can get access to me and who can see my contents.
	Facebook has the setting to limit the audiences of previous posts. So not everybody can go back and see anything.
	One day I found somebody can find my profile on Google, and I realized I information is everywhere. So I changed to only friends can view my profile. Then I noticed that people are adding me I don't know who they are, so I just set only friends of friends can request.
(Ownership)	Once you have comment on somebody else's posts, now you can move and control their posts, they can modify the rest of the posts and they're on their profile.
	Like even if I tried to delete the posts that I was embarrassed about, people say there still ways to find those online. Maybe because others repost or comment under your posts. People say once it's online, it's on there forever.
	The big thing about Snapchat is that everything is temporary, and I don't have much concern about how to delete those things. It's the opposite of Facebook where everything is permanent. Then we can have control over our information.
	If someone say hurtful things and you report to Facebook, Facebook would remove that content.
Tie strength (close friends vs. others)	If my very close friends do things like that, I will comment and criticize towards him.
	If the annoying content is from my close friend, I may send them a personal message saying I don't like that kind of content. But if they continue to do so, I will block their messages to come through. But for not so close friend, I probably wouldn't tell them about the things were annoying at all. My first reaction is just to unfriend them.
	For close friends, I prefer to talk to them in a personal conversation. The difference is that if you do that in person, it's a lot different from you posting things on social media where you just have opinions. There will be no pressure to talk to them.

> So far, I only defriend not so close friends. For one of my close friends that keep sending a lot of posts, I just skip through the posts instead of defriending her. At least she just posts more frequently but not dominating.

> If it's from your friends, you care. If somebody makes you feel like "what I have been doing my whole life while they are doing so well", you are kind of more related to somebody you know. So it's more hurt from my close friends.

> They may hurt me more because for close friends there is trust, respect, and it's hard for me to respect you as much if you saying something like that.

> If I receive a negative comment from an intimate friend I am much more offended than if it were to be from a stranger. For strangers, my response was to defriend them and move on. However, when a close family friend responded negatively to one of my posts, I was very hurt and angry for weeks and lost sleep over it.

> It's all about the intention. So I would be very upset that my friend or stranger posted something that putting them on a higher pedestal than the next person. And it would probably hurt a little bit more it's from a close friend.

Refining the Research Model

The previous section briefly described the major themes and codes that arose during the coding and typological analysis process. Many of the codes are consistent with the constructs in our research model (Figure 4). These findings provide support for the adequacy of the adopted theories in literature review, and they also provide rich insights into each construct and the relationships with other constructs. The refined definitions of the main constructs are shown in Table 11 (the words in italic are the changes). This section describes how the codes in five major themes relate to one another, refine the research model and reformulate the hypotheses. Figure 5 presents the refined model.

Figure 5. Refined Research Model
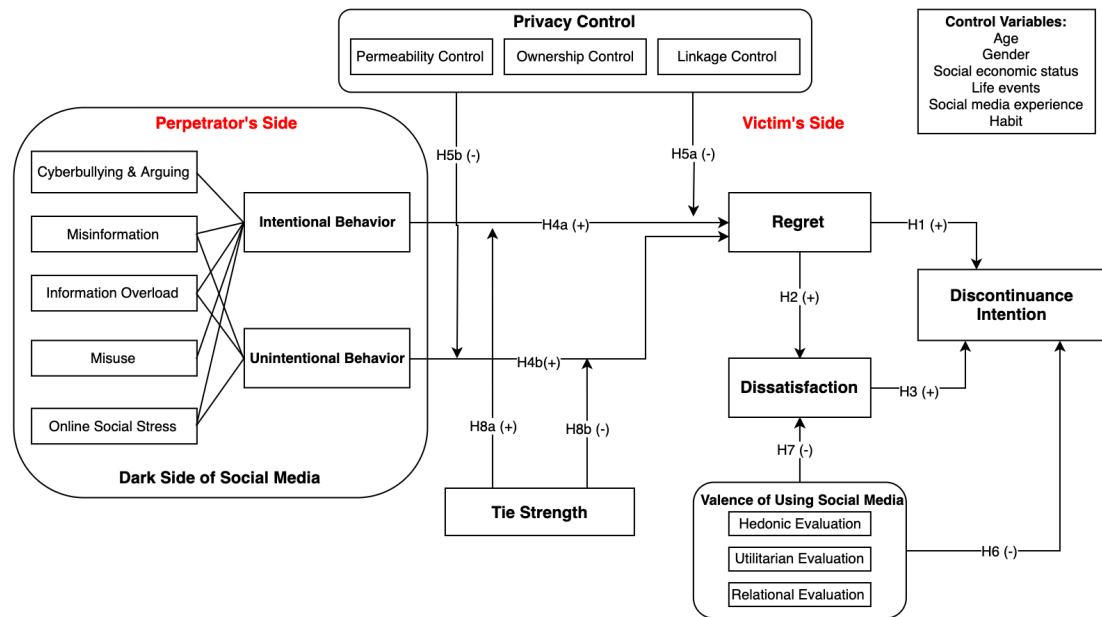
Based on the interview analysis and interpretation, we find the hypotheses on the relationships between regret, dissatisfaction, and discontinuance intention (H1-H3) are preserved. In addition, the relationship between the valence of using social media and dissatisfaction (H7) is not changed as well.

H1: Regret has a positive influence on discontinuance intention.

H2: Regret has a positive influence on dissatisfaction.

H3: Dissatisfaction has a positive influence on discontinuance intention.

H7: Valence of using social media (based on hedonic, utilitarian, and relational evaluation) has a negative influence on dissatisfaction. When the valence is higher, people will experience a lower level of dissatisfaction.

Table 11. Refined Definitions of the Main Constructs

Construct	Definition
Discontinuance intention	An individual's intention to stop using *some or all of* social media sites.
Regret	Negative emotional *and behavioral* reactions to a user's perception of using *a specific* social media site compared with not using that social media site.
	The level of regret is measured by types and time length of negative feelings and degrees of behavioral reactions.
Dissatisfaction	An affective state when a user's perception of actually using social media experience cannot meet the expected standard.
Dark side of social media	Negative effects of social media technologies use.
Privacy control	An individual's capability granted by social media sites to have control over *the sharing of information (both from themselves and from others)*.
Valence using social media	A summation of the positivity and negativity of the different emotions that people experience to arrive at an overall *evaluation of the benefits from* using social media.
Tie strength	The frequency and depth with which two people interact using social media technologies.
Cyberbullying & *arguing*	Willful and repeated harm *and inappropriate information* inflicted through the medium of electronic text*; and disagree with someone in words in an angry way.*
Misinformation	*The false or inaccurate information that is spread intentionally or without realizing it is untrue.*
Information overload	The amount of information exceeds the capacity an individual can process in a certain unit of time, *and it makes them difficult to find the information they are interested in.*
Misuse	*The unauthorized and deliberate misuse of the information of social media by individuals or organizations.*
Online social stress	*The stress caused by an inability to adapt to or deal with social media in a healthy manner. The stress comes from conformity, narcissism and social comparison, misinterpretation, and discrimination.*

However, other hypotheses are modified based on the interview findings. The valence of using social media is changed from a moderating factor between the relationship of dark side of social media and regret (H6) to an antecedent of discontinuance intention. It is because social media users don't even think about the benefits of social media before they have regret feelings and reactions, and the benefits cannot alleviate the hurt they get from the bad behaviors. They would only consider about the valence before making a decision about whether they would totally stop using social media sites or not.

Therefore, the following hypothesis is proposed:

H6: Valence of using social media (based on hedonic, utilitarian, and relational evaluation) has a negative influence on discontinuance intention.

The rest of hypotheses (H4, H5, H8) are modified mainly because we have developed a more appropriate way to define the dark side of social media construct. We still consider the dark side of social media as a broad term and the effect of each dimension is examined separately (Wong et al., 2008). As mentioned before, we have already categorized users' roles relating to the dark side of social media into two types - the perpetrator and the victim. From the perpetrator's perspective, we identified five behaviors that lead to the issues of the dark side of social media, which are cyberbullying & arguing, misinformation, information overload, misuse, and online social stress (including conformity, narcissism and social comparison, misinterpretation, and discrimination). These issues are built upon the literature about the dark side of social media, the characteristics of the dark side of IT use, and interview analysis. Since the

intention of bad behaviors is considered very important based on the interview analysis, we classified the behaviors into two types - intentional behaviors and unintentional behaviors. The harmfulness of different bad behaviors may vary to people with different personalities (e.g., some people hate fake news, while some think it is acceptable), but they all agree that intentional bad behaviors are always more destructive than unintentional ones. The intentional behaviors can result in cyberbullying & arguing, misinformation, misuse, and online social stress issues, while the unintentional behaviors can lead to misinformation, information overload, and online social stress. We expect cyberbullying & arguing and misuse can only be caused by intentional behaviors.

We only focus on regret, dissatisfaction, privacy control, and discontinuance intention from the victim's perspective. Other than the reasons we mentioned before, we also found people feel more regret if they were hurt by others than if they hurt others, as they believed their intentions were always good.

The relationship between the dark side of social media and regret and the moderating effect of privacy control are preserved. Therefore, the following hypotheses are proposed:

H4a: Intentional behavior of dark side of social media has a positive influence on victim's regret using social media.

H4b: Unintentional behavior of dark side of social media has a positive influence on victim's regret using social media.

H5a: Privacy control (i.e., permeability control, ownership control, linkage control) weakens the relationship between the intentional behavior of dark side of social

media and victim's regret using social media. Under the same level of the intentional behavior of dark side of social media, when privacy control is higher, victims will experience a lower level of regret.

H5b: Privacy control (i.e., permeability control, ownership control, linkage control) weakens the relationship between the unintentional behavior of dark side of social media and victim's regret using social media.

In this way, it's more suitable and reasonable to use tie strength as a moderating variable, since tie strength needs to effect on the interactions between two sides (i.e., perpetrator and victim) of people. The relationship between the perpetrator and the victim can either alleviate or aggravate the victims' regret feelings and reactions. For intentional bad behaviors, people endure higher level of regret if they have stronger tie strength. Strong tie strength requires high levels of trust and confidentiality between partners to disclose private information (Manago et al., 2012). The intentional bad behaviors can ruin the perceived trustworthiness stimulated from the social interaction ties (Tsai and Ghoshal, 1998). What's more, people with stronger tie strength have more overlap in their friend circles, then the negative behaviors can be easily spread by other common friends which may lead to more hurt (Oh et al., 2013). For example, one of the respondents said, "when a close friend responded negatively to one of my posts, I was very hurt and angry for weeks and lost sleep over it".

For unintentional harmful behaviors, people have higher tolerance towards their closer friends. They prefer to show more care and have additional interactions before they unfollow them, or they just ignore their unintentional behaviors. However, for people

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with weak tie strength who perform bad behaviors, no matter whether it is intentional or unintentional, the victims will have some regret reactions, such as defriend or unfollow them. Therefore, the following hypotheses with opposite effects are proposed:

H8a: Tie strength between victim and perpetrator strengthens the relationship between the intentional behavior of dark side of social media and victim's regret using social media. Under the same level of the intentional behavior of dark side of social media, when tie strength is stronger, victims will experience a higher level of regret.

H8b: Tie strength between victim and perpetrator weakens the relationship between the unintentional behavior of dark side of social media and victim's regret using social media. Under the same level of the unintentional behavior of dark side of social media, when tie strength is stronger, victims will experience a lower level of regret.

Finally, based on interview analysis, four demographic variables were found to have effects on discontinuance intention. Specifically, age was found to be a very important factor that can influence usage behaviors. In terms of social economic status, we found people with lower social economic status are less likely to discontinue to use social media, since they may feel more empowered by social media and easier to develop self-gratification. Major life events can shift users' needs and focus, and thus influence their discontinuance intention. Therefore, combining with the literature review, we have six control variables: age, gender, social economic status, life events, social media experience, and habit.

CHAPTER VI

QUANTITATIVE STUDY USING SURVEY

Problem Statement

Integrating qualitative insight into a quantitative study can improve the quality of a quantitative study (Venkatesh et al., 2013). The results of the qualitative study have provided rich insight to dark side of social media and users' regret experience, and they also helped to refine the research model. The second study aims to examine a finalized research model based on the findings of the first part. To the best of our knowledge, there is no existing study that identifies the antecedents of social media regret and relating regret to the dark side of social media. In addition, how privacy control and tie strength may affect the negative outcomes of social media use are still unclear. Therefore, we propose research questions for quantitative study using survey as follows:

1) How does dark side of social media influence users' regret in using social media?

2) How does privacy control and tie strength influence the relationship between the dark side of social media and regret?

3) How does regret and other factors affect social media discontinuance intention?

Research Model and Hypotheses

In the refined research model from qualitative study (Figure 5), we classified the bad behaviors into two types - intentional behaviors and unintentional behaviors. However, it is difficult to differentiate between the two types of behaviors from victims'

perception in the survey. Thus, we use dark side of social media construct to include all harmful intentional and unintentional behaviors in this study.

We define dark side of social media as a second-order construct incorporating five first-order factors, and it can be associated with other constructs directly. Each first-order factor is considered as a reflective construct. We also used survey to test the appropriateness of defining dark side of social media as a second-order factor (see analysis and results section). The research model of this study is shown in Figure 6. Based on literature review and findings of qualitative study, the following hypotheses are proposed:

H1: Regret has a positive influence on discontinuance intention.

H2: Regret has a positive influence on dissatisfaction.

H3: Dissatisfaction has a positive influence on discontinuance intention.

H4: Dark side of social media (incorporating cyberbullying & arguing, misinformation, information overload, misuse, online social stress) has a positive influence on users' regret using social media.

H5: Privacy control (incorporating permeability control, ownership control, linkage control) weakens the relationship between dark side of social media and users' regret using social media. Under the same level of dark side of social media, when privacy control is higher, victims experience a lower level of regret.

H6: Valence of using social media (incorporating hedonic, utilitarian, and relational evaluation) has a negative influence on discontinuance intention.

H7: Valence of using social media (incorporating hedonic, utilitarian, and relational evaluation) has a negative influence on dissatisfaction.

H8: Tie strength between victim and perpetrator strengthens the relationship between dark side of social media and victims' regret using social media. Under the same level of dark side of social media, when tie strength is stronger, users experience a higher level of regret.

Since tie strength has contrasting moderating effects on the relationship between intentional/unintentional behavior and regret, it is difficult to propose one hypothesis about tie strength. For example, a social media user may feel more depressed if s/he receives cyberbullying message from his/her friends, since strong tie strength generate trust and their trust is destroyed because of the negative behavior. In contrast, people may feel less annoying if they see overwhelming content from their friends, and they may be pleasant to share more private contents with their friends. Accordingly, tie strength between victim and perpetrator may weaken the relationship between dark side of social media and regret. Therefore, we propose an alternative hypothesis:

H8a: Tie strength between victim and perpetrator weakens the relationship between dark side of social media and victims' regret using social media.

Figure 6. The Research Model for Quantitative Study
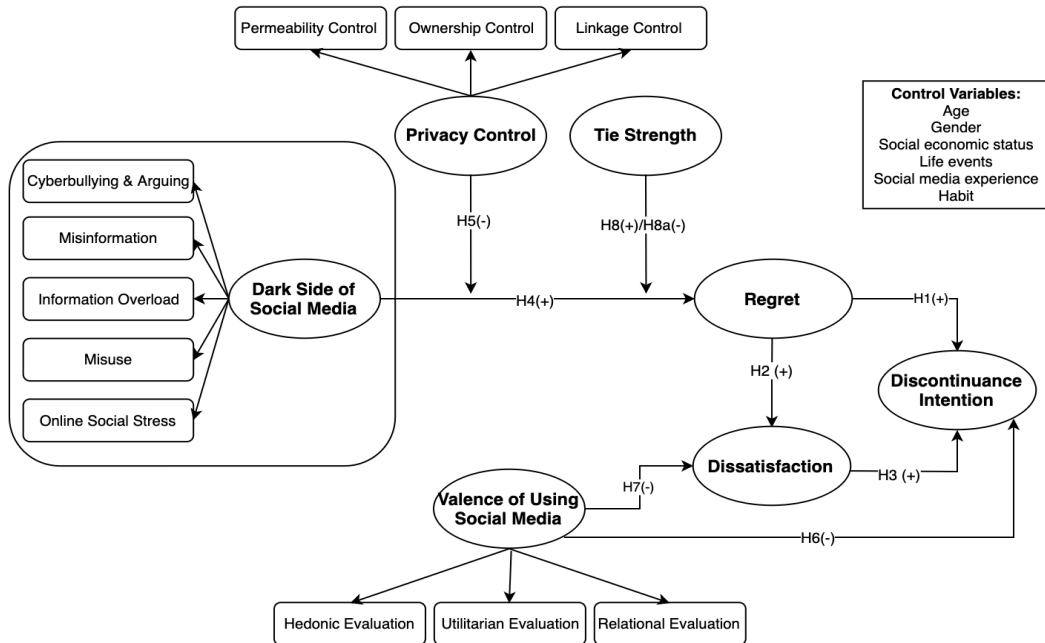
Method

Measures

A preliminary set of items were developed for each construct based on the findings from qualitative study and scales from extant literature. We also ensure that at least three reflective items were used to measure each construct. Each item was measured on a five-point Likert scale. The initial instrument is provided in Appendix B-1.

To measure social media discontinuance intention, dissatisfaction and habit, we drew upon existing measures of social networking website discontinuance use (Turel, 2015; Xu et al., 2015). Valence of using social media is a second order construct incorporating three first order factors (Hu et al., 2015). Social media use experience was

measured in terms of intensity, frequency, and duration (Hu et al., 2015). We adapted

Liao et al.'s (2017) online shopping regret scales to measure social media regret.

Dark side of social media was measured based on the definition of dark side of IT

from D'Arcy et al. (2014). Among the five issues of dark side of social media, the scales

of cyberbullying and information overload were adapted from extant literature about

online social networks (Hinduja and Patchin, 2008; Kokkinos et al., 2016; Kefi and

Perez, 2018). New scales were generated to measure misinformation based on the

findings of interview. To measure misuse, we adapted Marshall's (2012) Facebook

surveillance scales and Stewart and Segars's (2002) information privacy concern scales

about secondary use. The measurements of online social stress were initially adapted

from Ayyagari et al.'s (2011) technostress scales, and then were further refined based on

the findings of interview. The issues of dark side of social media were measured based on

victims' perception.

The scales of three dimensions of privacy control were adapted from Child et al.'s

(2009) blogging privacy disclosure scales. We also added new scales based on the

findings of interview so that each dimension had four reflective items. In addition, we

adapted Levin and Cross's (2004) tie strength scales in knowledge transfer context to

measure tie strength between dark side of social media victim and perpetrator. Because

tie strength refers to a connection between nodes (i.e., social media users) that enables

interaction, it must happen in the situations that both perpetrator and victim of bad

behaviors exist (Kane et al., 2014). If a user has never experienced an issue of dark side,

s/he cannot be a victim of that bad behavior and won't be able to answer questions about

his/her relationship with the people who perform that bad behavior. Therefore, we designed five scenarios related to the five issues of dark side of social media. In each scenario, the survey was designed to stop users from answering the corresponding tie strength questions if they have never suffered from this bad behavior. The overall tie strength construct was calculated using the average tie strength of the five scenarios.

In this study, the measurement development method proposed by Straub (1989) was employed. First, the preliminary set of items developed above were examined by four faculty members through a pre-test of the instrument. Following revisions to the set of questions, a pilot test was conducted on twenty university students to refine the questions. All the recommendations were considered and necessary changes were made, such as a number of items were reworded for simplification or clarification. The final instrument is provided in Appendix B-2.

Data Collection

The questionnaire was distributed to respondents in the U.S. electronically through Qualtrics online survey platform. Besides 91 responses collected from friends and students who have used social media, we utilized a market research firm, Qualtrics Research Services, to survey social media users. We decided to purchase data from Qualtrics Research Services because it is much easier to integrate a Qualtrics survey with it, and it was examined to yield higher quality data comparing with Soapbox Sample and Reddit and can yield more completed responses than Amazon Mechanical Turk (Ibarra et al., 2018).

The survey was sent to a random sample who were at least 18 years old and with equally distributed age and gender groups. Each respondent should have experience of using social media sites. During the collecting process, a speeding check was added to automatically terminate the respondents who spent less than half the median time to complete the survey, which indicated that they didn't read through the questions carefully to give reliable responses. A total of 541 individuals accessed our survey, and 198 completed responses were collected. We also screened out the responses that include divergent answers for very similar questions. Finally, we got 141 (71.2%) qualified responses from Qualtrics Research Services. Including the 91 responses from friends and students, there were a total of 232 respondents. Table 12 provides their demographic profile.

Non-response bias was tested by assessing the differences between the first and fourth quartiles of responses in demographics and constructs (Armstrong and Overton, 1977). Results of unpaired t-tests ($p = 0.134$) suggested no significant differences between the responses, which alleviate concerns about non-response bias.

Table 12. Sample Demographics

Demographic Item	Level	Number	Percent
Age	18-25	96	41.4%
	26-35	35	15.1%
	36-45	28	12.1%
	46-55	29	12.5%
	56+	44	19.0%
Gender	Male	116	50.0%
	Female	116	50.0%
Household Income	Less than $20,000	98	42.2%
	$20,001-$60,000	65	28.0%
	$60,001-$100,000	37	15.9%

	$100,000+	32	13.8%
Social Media Site	Facebook	116	50.0%
	Twitter	19	8.2%
	Instagram	43	18.5%
	Snapchat	25	10.8%
Social Media Use Experience - Each Day Usage	Less than 10 minutes	23	10.0%
	10-30 minutes	56	24.1%
	30-60 minutes	63	27.2%
	1-3 hours	54	23.3%
	3+ hours	36	15.5%
Social Media Use Experience - Frequency	Less than once a week	8	3.4%
	Less than once a day	17	7.3%
	1-2 times each day	43	18.5%
	3-5 times each day	67	28.9%
	More than 5 times each day	97	41.8%
Social Media Use Experience - Duration	Less than 2 months	8	3.4%
	2-12 months	7	3.0%
	12-24 months	14	6.0%
	24-48 months	24	10.3%
	More than 48 months	179	77.2%

Analysis and Results

We analyzed the data using covariance-based structural equation modeling (SEM) in SPSS Amos. SEM using SPSS Amos software provides the means to assess measures of fit for both the measurement model and the structural model.

Before testing the research models, we used descriptive statistics to reveal the number of users who have negative experience in using social media sites (Table 13). Overall, 87% respondents have misinformation experience, and 69% respondents have information overload experience. 18.5% respondents have experienced all of the five issues of dark side of social media, and only 5.2% respondents have never experienced any issues. We can conclude that the dark side of social media is a prevalent phenomenon.

As demonstrated above, the overall tie strength construct was calculated using the average tie strength of the five issues. We removed twelve respondents who have never experienced any bad behaviors before we conduct hypothesis analysis, since there is no record of their tie strength with the people who perform bad behaviors. Finally, the sample size was reduced to 220.

Table 13. Descriptive Statistics for Dark Side of Social Media

Negative Experience	Number	Percent
Cyberbullying	125	53.9%
Misinformation	202	87.1%
Information Overload	160	69.0%
Misuse	105	45.3%
Online Social Stress	127	54.9%
All of the five issues	43	18.5%
None of the five issues	12	5.2%

Measurement Model

To assess the fitness of measurement model, we conducted a confirmatory factor analysis (CFA) model with all possible unanalyzed associations among the first-order latent variables. CFA is commonly used to verify the reliability and validity of an instrument. As shown in Table 14, model fit was assessed in terms of comparative fix index (CFI), Chi-square over degree of freedom, root mean square error of approximation (RMSEA), and standardized root mean squared residual (SRMR) (Kline, 2005). It can be seen that the value of the RMSEA is .064, and the 90% confidence interval of the RMSEA is (.06, .069). RMSEA of less than .05 indicates close approximate fit; values between .05 and .08 suggest reasonable error of approximation; RMSEA of greater than .10 suggests poor fit. Thus, RMSEA suggested a reasonable model fit. However, a

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SRMR value of 0.086, which is larger than 0.08, is generally considered to indicate poor

model fit. The CFI value of 0.795 which is smaller than 0.90 is also considered to

indicate a very poor model fit. Therefore, the measurement model needed to be improved.

Table 14. Measurement Model Fit Statistics

Model Fit Indices	Measurement Model	Improved Measurement Model
CFI	0.795	0.868
Chi-square/df	1.958	1.848
RMSEA (90% Confidence Interval)	0.064 (0.06-0.069)	0.061 (0.055-0.066)
SRMR	0.086	0.065

A scale is said to be reliable if its factor loading is larger than 0.70 (Bagozzi and

Yi, 1988). It can be seen that the factor loadings of some items are much smaller than

0.70 for cyberbullying, misinformation, permeability control, ownership control, and

linkage control constructs (see Table 15). A careful inspection of the measurement items

reveals that it is reasonable to remove the item with the lowest factor loading for each

construct above. For example, the third item of misinformation, "I cannot differentiate

between fake news, real news, and opinion news on this social media site", measures

users' capability rather than their bad experience related to misinformation. The first item

of permeability control, "When I have something important happening in my life, I feel

comfortable talking about them on this site", is related to privacy control in the disclosure

of their own personal information, which is measured in linkage control construct; while

other three items are about their methods to deal with content from other users. For dissatisfaction, the factor loading of the fourth item is much smaller than 0.70. The first three items measure three different perspectives (information, function, network) of dissatisfaction which are highly correlated with the three dimensions of valence of using social media, while the fourth item measures their dissatisfaction directly. Since valence of using social media is an antecedent of dissatisfaction, in order to reduce collinearity between these two constructs, we decided to remove the first three items and only the fourth item to measure dissatisfaction directly. Finally, we removed the items in italic in Table 15, and details are shown in gray font color in Appendix B. As shown in Table 14, the improved measurement model has a better model fit. The model fit statistics are all within the recommended ranges indicating that our scales have acceptable psychometric properties.

Then, we examine the convergent validity and discriminant validity of measurement scales. Convergent validity is examined based on composite reliability (CR) and average variance extracted (AVE). To reach good convergent validity, all indicators should have good loadings on their substantive latent factors (CR > 0.7) and the AVE for all constructs should exceed 0.5. All the indices are shown in Table 15. We can find that after removing the unreliable items, the AVE values of all constructs are acceptable. Only four constructs have AVE values that are slightly smaller than 0.50. Therefore, the improved measurement model achieves convergent validity.

Table 15. Convergent Validity Indices

Construct	Measurement Scale	Factor Loading / CR	AVE	Improved AVE
Cyberbullying	Bullying_1	0.738	0.464	0.496
	Bullying_2	0.647		
	Bullying_3	*0.569*		
	Bullying_4	0.789		
	Bullying_5	0.639		
Misinformation	Misinfo_1	0.683	0.442	0.520
	Misinfo_2	0.802		
	Misinfo_3	*0.498*		
	Misinfo_4	0.642		
Information Overload	Overload_1	0.8	0.618	0.618
	Overload_2	0.768		
	Overload_3	0.739		
	Overload_4	0.835		
Information Misuse	Misuse_1	0.639	0.607	0.607
	Misuse_2	0.815		
	Misuse_3	0.85		
	Misuse_4	0.796		
Online Social Stress	Stress_1	0.686	0.538	0.538
	Stress_2	0.757		
	Stress_3	0.734		
	Stress_4	0.756		
Permeability Control	*Permea_1*	*0.31*	0.341	0.466
	Permea_2	0.714		
	Permea_3	0.567		
	Permea_4	0.643		
Ownership Control	Owner_1	0.593	0.305	0.432
	Owner_2	*0.373*		
	Owner_3	0.651		
Linkage Control	Link_1	0.709	0.369	0.484
	Link_2	0.621		
	Link_3	0.643		
	Link_4	*0.418*		
Tie Strength	Tie_1	0.807	0.635	0.635
	Tie_2	0.787		
Hedonic Evaluation	Hedonic_1	0.677	0.523	0.523
	Hedonic_2	0.767		

Utilitarian Evaluation	Utilitarian_1	0.763	0.596	0.596
	Utilitarian_2	0.781		
Relational Evaluation	Social_1	0.864	0.656	0.656
	Social_2	0.867		
	Social_3	0.686		
Regret	Regret_1	0.876	0.725	0.725
	Regret_2	0.888		
	Regret_3	0.786		
Dissatisfaction	*Satis_1*	*0.701*	0.502	--
	Satis_2	*0.799*		
	Satis_3	*0.839*		
	Satis_4	0.417		
Discontinuance	Intention_1	0.872	0.701	0.701
	Intention_2	0.801		

According to the Fornell-Larcker testing system (1981), discriminant validity can be assessed by comparing the amount of the variance capture by the construct (AVE) and the shared variance with other constructs. Thus, the levels of the AVE for each construct should be greater than its squared correlations with all the other constructs (see Table 16). In this table, we only show the relationships that are significantly correlated. We can find except the relationship between regret and discontinuance and the relationship between hedonic evaluation and utilitarian evaluation, the values of all the other correlations are smaller than 0.7. Then their squared correlations are much smaller than 0.49, which are smaller than the levels of AVE. The AVE of regret is 0.725, and it is greater than its squared correlation with discontinuance ($0.764^2 = 0.584$). The AVE of hedonic evaluation is 0.523, and it is greater than its squared correlation with utilitarian evaluation ($0.716^2 = 0.512$). Therefore, we can conclude that the criterion for sufficient discriminant validity is met.

Table 16. Discriminant Validity Indices

Relationship	Correlation
Bullying <-> Misinformation	0.34
Bullying <-> Overload	0.401
Bullying <-> Misuse	0.371
Bullying <-> Stress	0.555
Misinformation <-> Overload	0.562
Misinformation <-> Misuse	0.359
Misinformation <-> Stress	0.406
Overload <-> Misuse	0.328
Overload <-> Stress	0.582
Misuse <-> Stress	0.363
Permeability <-> Ownership	0.535
Permeability <-> Linkage	0.428
Ownership <-> Linkage	0.585
Hedonic <-> Utilitarian	*0.716*
Hedonic <-> Relational	0.569
Relational <-> Utilitarian	0.67
Bullying <-> Regret	0.423
Bullying <-> Discontinuance	0.362
Misinformation <-> Regret	0.312
Misinformation <-> Discontinuance	0.288
Misinformation <-> Dissatisfaction	0.328
Overload <-> Regret	0.425
Overload <-> Discontinuance	0.363
Misuse <-> Regret	0.417
Misuse <-> Discontinuance	0.359
Misuse <-> Dissatisfaction	0.23
Stress <-> Regret	0.316
Stress <-> Discontinuance	0.328
Ownership <-> Dissatisfaction	-0.328
Regret <-> Dissatisfaction	0.505
Regret <-> Discontinuance	*0.764*
Dissatisfaction <-> Discontinuance	0.562

From the results above, we can elaborate why it is appropriate to define dark side of social media as a second-order construct incorporating five first-order factors, so that it can be associated with other constructs directly. In previous literature, the second way to define the dark side of social media is to consider it as a broad term with five dimensions.

Then, we need to develop hypotheses at the dimension level and draw no conclusion about the overall construct (Wong et al., 2008). From Table 16, we can find the five first-order factors of dark side of social media are significantly correlated. If we define the dark side of social media in the second way, then a set of latent variables (i.e., five issues of dark side) will all cause the same construct (i.e., regret), and their collinearity may difficult to separate their effects. Thus, by having the causality work through a single second-order factor (i.e., dark side of social media), the collinearity is highly reduced. Furthermore, by having just one second-order latent variable instead of many first-order variables, the model is more parsimonious. Therefore, it is reasonable to define dark side of social media as a second-order construct.

Structural Model and Hypotheses Testing

We first examine our structural model without moderators (i.e., privacy control, tie strength). The fit indices (Table 17) suggest that the model demonstrates acceptable fit with the data. The R-square value of dependent variables represents the predictiveness of a theoretical model. As shown in Figure 7, the proposed model explains approximately 86% variance for social media users' discontinuance intention, 30% variance for regret, and 33% variance for dissatisfaction. According to the minimum 10% criterion, our model demonstrates explanatory power because the R-square values are much greater than 10% (Guo and Yuan, 2012). In addition, the standardized path coefficients are good indicators of the relationships strength between independent and dependent variables. The results of our structural model test (Figure 7) support most of the hypothesized relationships.

Table 17. The Structural Model Fit Statistics

Model Fit Indices	Structural Model without Moderator	Full Structural Model
CFI	0.872	0.905
Chi-square/df	2.021 (912/451)	2.788 (262/94)
RMSEA (90% Confidence Interval)	0.066 (0.060-0.073)	0.09 (0.077-0.103)
SRMR	0.077	0.093

Figure 7. Results of The Structural Model without Moderator
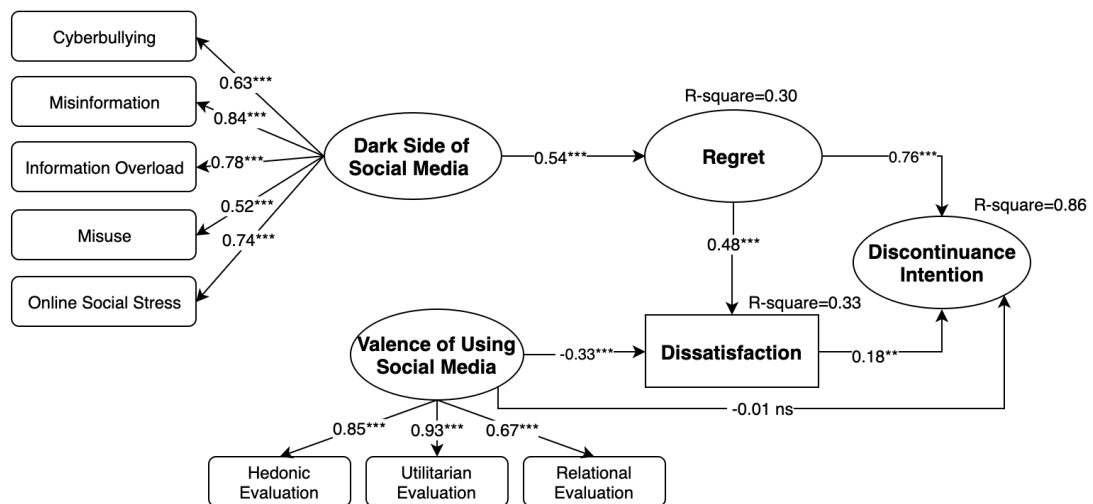
Our results show that all the dimensions of second-order factors are significant. Thus, dark side of social media is a well-defined second-order construct incorporating five first-order factors in the social media discontinuance context. Five of the six path coefficients are significant, thus providing supports for relationships between (1) regret and discontinuance intention (H1) (b = 0.76, p < 0.001); (2) regret and dissatisfaction (H2) (b = 0.48, p < 0.001); (3) dissatisfaction and discontinuance intention (H3) (b =

0.18, p = 0.005); (4) dark side and regret (H4) (b = 0.54, p < 0.001); (5) valence and

dissatisfaction (H7) (b = -0.33, p < 0.001). However, the valence of using social media

has a non-significant effect on discontinuance intention, thus H6 is not supported.

Then, we examine the full structural model with privacy control and tie strength

as moderators. Moderating effects are indicated by the interaction of dark side and

privacy control and the interaction of dark side and tie strength in explaining regret. Since

all of them are latent variables, it is difficult to calculate the product terms (i.e.,

multiplying dark side by privacy control, multiplying dark side by tie strength). Data

imputation is used to replace each missing value in a dataset by an estimate. During data

imputation process, the model is first fitted using maximum likelihood method, which has

the same standard as SEM. After that, the unobserved values for each case are predicted

as a linear combination of the observed values for that same case. A latent variable is

treated as an extreme case of missing data in which every observation on the variable is

missing. Thus, we can first use data imputation function in SPSS Amos to combine the

items of each latent variable (i.e., dark side, privacy control, tie strength) to a single

composite item. Then, we standardized these variables and created two new interaction

variables (i.e., dark side X privacy control, dark side X tie strength). Finally, we were

able to examine the full structural model using three independent variables: dark side, the

interaction of dark side and privacy control, and the interaction of dark side and tie

strength.

The fit indices (Table 17) suggest that the full structural model demonstrates

acceptable fit with the data. The results of our structural model test are shown in Figure 8.

The full model explains approximately 49% variance for regret, which is much higher than that in the model without moderators. The coefficients of all the relationships among regret, dissatisfaction, valence, and discontinuance are almost the same as those in Figure 7, which indicates that the regression imputation method is reliable.

Figure 8. Results of The Full Structural Model
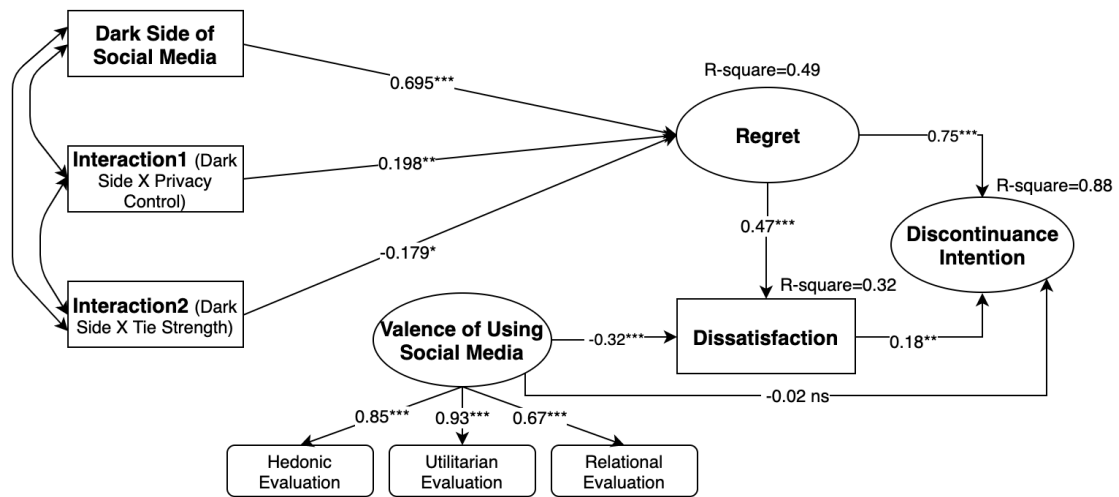
Our results show that both privacy control and tie strength moderate the relationship between dark side of social media and regret. However, H5 is not supported since privacy control actually strengthens the relationship instead of weakening it (b = 0.198, p = 0.004). Figure 9 plots the interaction and shows that the positive relationship between dark side and regret amplifies when privacy control is high.

Figure 9. Two-way Interaction Effects for Privacy Control
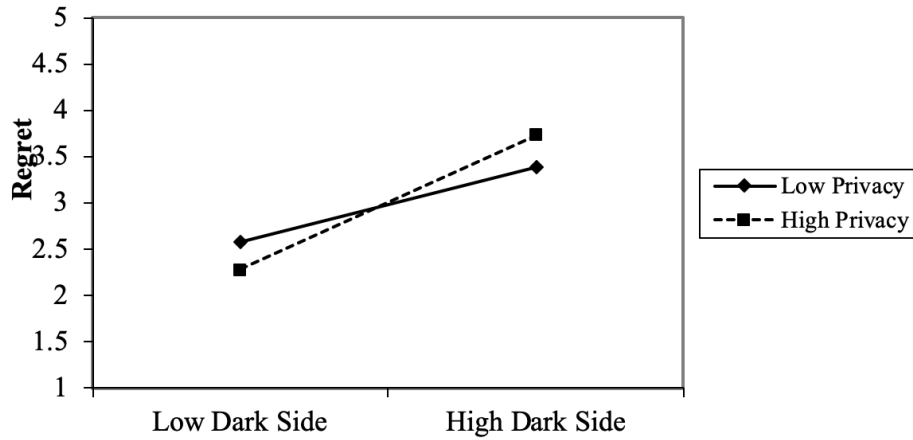
The relationship between the product term 2 (dark side X tie strength) and regret is significant (b = -0.179, p = 0.013), which indicates that alternative hypothesis (H8a) about tie strength is supported. On an interaction plot, parallel lines indicate that there is no interaction effect while different slops suggest that one might be present. Figure 10 plots the interaction and shows that the positive relationship between dark side and regret dampens when tie strength is high. There are no crossed lines on the graph mainly because tie strength is also an indicator of regret and its effect is higher than the interaction term (b = -0.452, p = 0.01).

Figure 10. Two-way Interaction Effects for Tie Strength
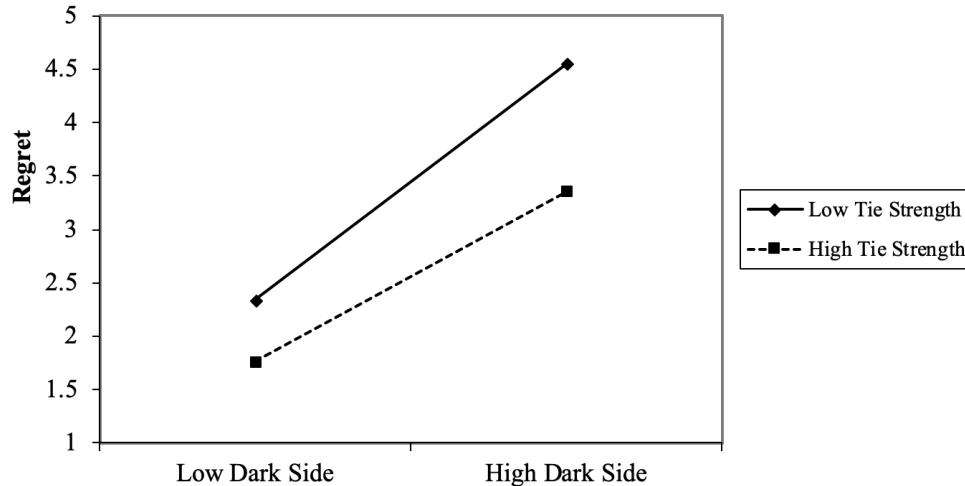
Among control variables, (1) social economic status has a negative effect on discontinuance intention (cr = -0.095, p = 0.049); (2) habit has a significant negative effect on regret (cr = -0.278, p < 0.001); (3) social media experience has a significant negative effect on regret (cr = -0.209, p < 0.001). Age, gender, and life events have no significant effect on regret, dissatisfaction, and discontinuance intention.

Discussion

In this study, we advance the theory on IS discontinuance from social media perspective by testing propositions using survey. The results make several important contributions to the literature.

Dark Side of Social Media and Regret

One of the main objectives of this study is to understand how dark side of social media influences users' regret in using social media. In prior literature, researchers define

dark side social media as a broad term with several dimensions. It was not considered as a reflective, formative, or aggregate construct, and hypotheses were always developed at the dimension level and draw no conclusion about the overall construct (Kefi and Prerez, 2018; Fox and Moreland, 2015; Wong et al., 2008). Some research also examined the causes or negative consequences of a specific dimension of dark side of social media (Davenport et al., 2014; Gomez-Rodriguez et al., 2014). In our study, we integrated the various aspects of dark side of social media and define dark side of social media as a second-order construct incorporating five first-order factors: cyberbullying & arguing, misinformation, information overload, misuse, and online social stress. It was considered as a reflective construct, and it can be associated with regret construct directly. It is appropriate to define it as a second-order construct since the five first-order factors are significantly correlated and all cause the same regret construct. Thus, by having the causality work through a single second-order factor, the collinearity is highly reduced, and the model is more parsimonious.

The results show that dark side of social media has a positive effect on regret, which indicates the availability of information about dark side of social media can influence whether a user feel regret or not. When a user has experienced some bad behaviors on social media sites, s/he is more likely to feel regret. This finding is vital because regret is a relative new construct, and only few theories pertaining to consumer regret have been adopted to e-commerce and social media environments. To the best of our knowledge, there is no existing study theoretically and empirically examining the relationship between dark side of social media and regret.

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Discontinuance Intention

Extant literature has yielded scant evidence on the causes of the IS discontinuance intention, especially in the social media context. While previous study on social media discontinuance aimed to explain users' intention to switch social media providers, our study is about the cessation of the use of social media technologies. We don't concentrate on users' behaviors on a specific social media platform, but on their general experiences of using any social media platforms.

The results show that both regret and dissatisfaction have positive influence on social media discontinuance intention. Previous literature drew on expectation disconfirmation theory to argue that only dissatisfaction can determine future use (Bhattacherjee and Premkumar, 2004), we found that dissatisfaction alone lacks sufficient power to fully explain behavioral intentions. Furthermore, the effect size of regret is larger than dissatisfaction, which indicates that users' past cumulative negative feelings play a more important role in influencing their future use intention.

In addition, the relationship between regret and discontinuance intention is mediated by dissatisfaction. It is because users will adjust their level of expectation and satisfaction with social media platforms depending on how they feel about the bad experiences. Some studies have discovered regret to be a significant determinant of consumers' dissatisfaction (Zeelenberg and Pieters, 2004; Taylor, 1997).

Valence of using social media was also found to influence dissatisfaction, which suggests that users feel dissatisfied when they have low perception of benefits provided by social media. The relationship between valence and discontinuance is mediated

through dissatisfaction. However, the results show that the valence of using social media has a non-significant direct effect on discontinuance intention. It counters the findings from our qualitative study, whereas it can be supported by prior literature on regret and social media use (Tsiros and Mittal, 2000). Hu et al. (2015) demonstrated that online social value is an aggregate construct incorporating utilitarian benefits, hedonic benefits, information risk, and effort, and it can influence continuance use. Thus, the valence construct which only includes benefits dimensions in our study is not sufficient to predict future use intention.

Privacy Control

The results show that privacy control moderates the relationship between the dark side of social and regret. This is the very first study that examine the impact of privacy control on social media regret. In the social media context, users usually take high risks in the disclosure of personal information and need more privacy protections. Privacy control is defined as an individual's capability granted by social media sites to have control over the sharing of information (both from themselves and from others) in our study. Based on communication privacy management theory, we defined privacy control as a second-order factor incorporating three dimensions – permeability control, ownership control, and linkage control. These dimensions were redefined, and the measurement scales were adapted depending on the dark side of social media context. We refined the definition of permeability control to only include privacy control over the sharing of information from others, while using linkage control to measure users' privacy control over the sharing of information from themselves.

We found that privacy control amplifies the relationship between dark side of social media and regret, which countered our initial hypothesis. It indicates that when the frequency and extent the users suffered from bad behaviors is relative low, they are more likely to have regret experience if they have lower privacy control. It is because privacy control on social media sites can greatly mitigate user perceptions of risks associated with disclosing personal information (Krasnova et al., 2010). For those users who have seldom experienced bad behaviors on social media sites, they still have trust on social media platforms and believe higher privacy control can protect them from suffering from destructive behaviors.

However, when the frequency and extent they suffered from bad behavior is relative high, they tend to have higher level of regret if they have higher privacy control. This finding is interesting. It may because after having regret feelings generated from others' destructive behaviors, people would be more agreed with the importance of privacy control and tend to use different privacy control methods to protect themselves from being hurt for another time. More privacy control functions on a social media platform would make them feel that this platform is more unsecure. In addition, both privacy concerns and negative feelings are influenced by personality differences and demographic differences (Smith et al., 2011). For users who are not sensitive to negative behaviors, they don't need to use many privacy control methods and may have less regret experience. For people who have higher privacy awareness, they are more conscious of bad behaviors and tend to set various privacy settings. Furthermore, users' willingness to contribute in social media sites depends somewhat on the audience they believe exists for

that content, and privacy settings change the nature and scope of the audience (Kane et al., 2014). Then, stronger privacy settings may encourage users to post more personal content in certain conditions (Joinson, 2008). Thus, the emerging of bad behaviors may surprise them and make them feel out of control, then making them feel more regret.

Tie Strength

There was no empirical study examining how tie strength may exaggerate or mitigate the impacts of the dark side of social media. The results show that tie strength not only dampens the relationship between dark side and regret, but also has negative effect on regret directly. Since the overall tie strength construct was calculated using the average tie strength of the five issues, it actually measured users' tie strength with all their friends who performed bad behaviors on social media sites in general. It indicated that when users' tie strength with their friends who performed bad behaviors is low, they experience a higher level of regret. It is because people have more trust and tolerance towards their close friends (March, 1991; Levin and Cross, 2004), and those bad behaviors online may be not destructive enough to ruin their trust and relationship in their real life (Reich et al., 2012). Even though their intimate friends did something really bad online, they can understand their feelings and still believe that they didn't do it on purpose. They may also reply to their friends online to communicate about how they think, which alleviate their regret feelings to some extent.

Control Variables

For control variables, people who have more social media experience and habit are less likely to discontinue social media use. These results are consistent with our

cognition and are supported by previous literature (Turel and Serenko, 2012). People who have higher social economic status are less likely to discontinue social media use, because they may have accessed computers and Internet for a longer time, and they have more experience of overcoming bad behaviors.

Age, gender, and major life events have no significant effect on social media users' regret, dissatisfaction, and discontinuance intention. However, age is a very important factor from both literature and our qualitative study, and it may have effects on some other constructs or relationships. For example, age was found to have significant effects on all of the five issues of dark side of social media: (1) has a negative effect on cyberbullying ($cr = -0.197$, $p = 0.005$); (2) has a negative effect on misinformation ($cr = -0.228$, $p = 0.005$); (3) has a negative effect on information overload ($cr = -0.135$, $p = 0.038$); (4) has a positive effect on misuse ($cr = 0.206$, $p = 0.002$); (5) has a negative effect on online social stress ($cr = -0.429$, $p < 0.001$). It indicates that older people are more likely to suffer from misuse behavior, while they are not conscious of any other bad behaviors. Cyberbullying is also found to be more frequent within younger populations (Zhang et al. 2016).

CHAPTER VII

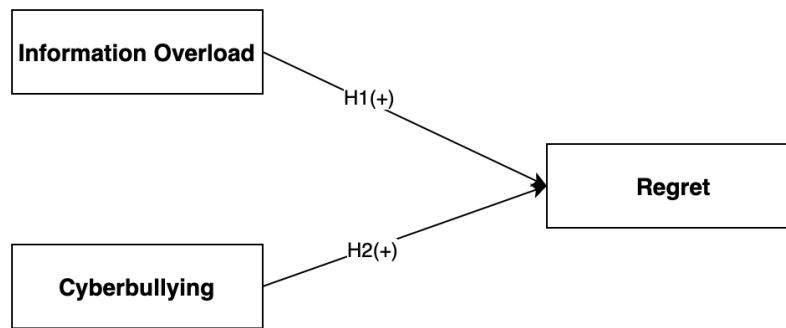QUANTITATIVE STUDY USING SECONDARY DATA

Problem Statement

The third part of dissertation is a positivist study using secondary data from social media sites to examine the prevalence of dark side of social media and how it may influence regret experience. The relationship is the essential part of our research model, and the results from this study can further validate our model by looking at actual behaviors.

We cannot examine the full research model (Figure 6) using secondary data, since some of the constructs can only be measured using self-assessment data, such as online social stress, valence, and dissatisfaction. Therefore, we only selected the constructs that can be measured using secondary data. Among the five issues of dark side of social media, information overload and cyberbullying issues that are available to a user can be investigated from overwhelming or offensive posts contributed by his or her friends. Furthermore, based on the findings of previous sections, we can use regret behavioral reactions (e.g., deactivate social media account, defriend or mute the person who performed bad behavior) to measure users' level of regret. Consequently, we aim to examine the relationship between information overload and users' regret in using social media and the relationship between cyberbullying and regret. The research model of this study is shown in Figure 11. The following hypotheses are proposed:

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H1: The availability of information overload has a positive influence on users' regret using social media.

H2: The availability of cyberbullying has a positive influence on users' regret using social media.

Figure 11. The Research Model for Quantitative Study Using Secondary Data

This study is exploratory and is limited by the time and the data that was available from secondary source.

Method

We conducted a quantitative study using secondary data to test the hypotheses. We collected approximately 10.7 GB dataset from Twitter. In this section, we describe the details of data collection, preprocessing, and cleaning performed to generate a clean dataset for analysis.

Twitter is one of the platform services for micro blogging founded by Jack Dorsey in 2005. Twitter started from the ideas about development of media which are

highly live and suitable for communication among friends. Until Feb 2019, it has about 130 million daily active users, with about 600 million tweets per day. However, Twitter reported that the number of monthly active users was declining (Shaban, 2019). We decided to use Twitter data mainly because the availability of data and tools. In contracts to Facebook, almost all Twitter activities, except direct messages and private profiles, are visible to everyone. More Facebook users (estimated to be more than 50%) have made their profiles "private" compared with Twitter users (less than 10%) (Tufekci, 2014). Furthermore, Twitter data has a simple and clean structure with a maximum of 140 characters per tweet and only a few basic functions (e.g., retweet, mention, quote, hashtag, favorite, and follower-followee relationship).

In order to download data of all activities related to Twitter users, we used Twitter application programming interfaces (APIs), which is a set of protocols and tools for building application software. It allows any third party to access Twitter data with constraints. In our study, Twitter data was retrieved and preprocessed using "rtweet" R package.

Package "rtweet" is an implementation of calls designed upon R to collect and organize Twitter data via Twitter's REST and stream API. It includes features to search tweets, stream tweets, get friends, get timelines, search users, and etc. For the purpose of testing our hypotheses, data about the availability of information overload and cyberbullying can be explored from a user's home page (see Figure 12a), which contains all tweets, retweets, and replies contributed by his or her friends; data about a user's regret behavioral reactions can be investigated from his/her own profile (see Figure 12b),

which contains the status (i.e., private or public) of his/her account, lists of his/her friends, and his/her history of posting tweets, retweets, and replies. The procedure for identifying sample users and relevant information has three steps.

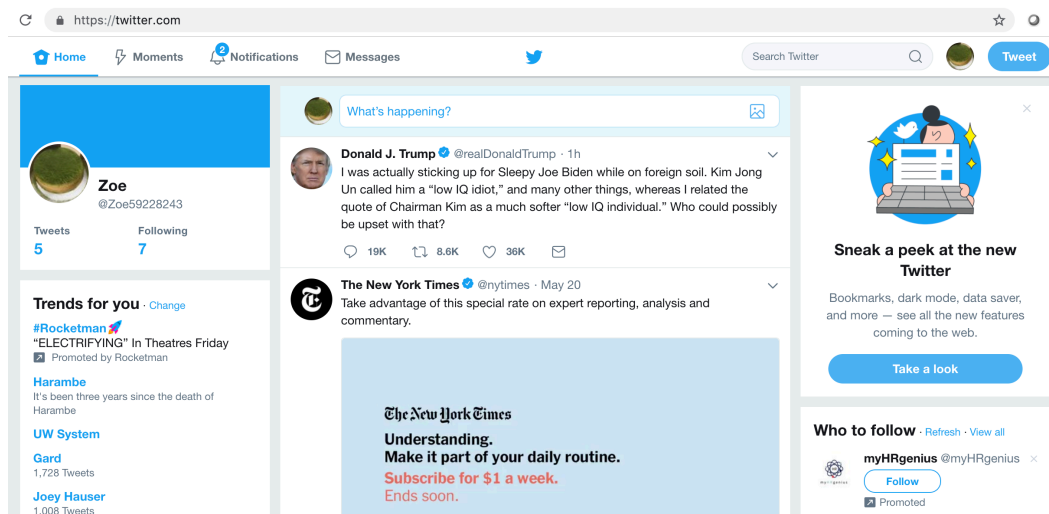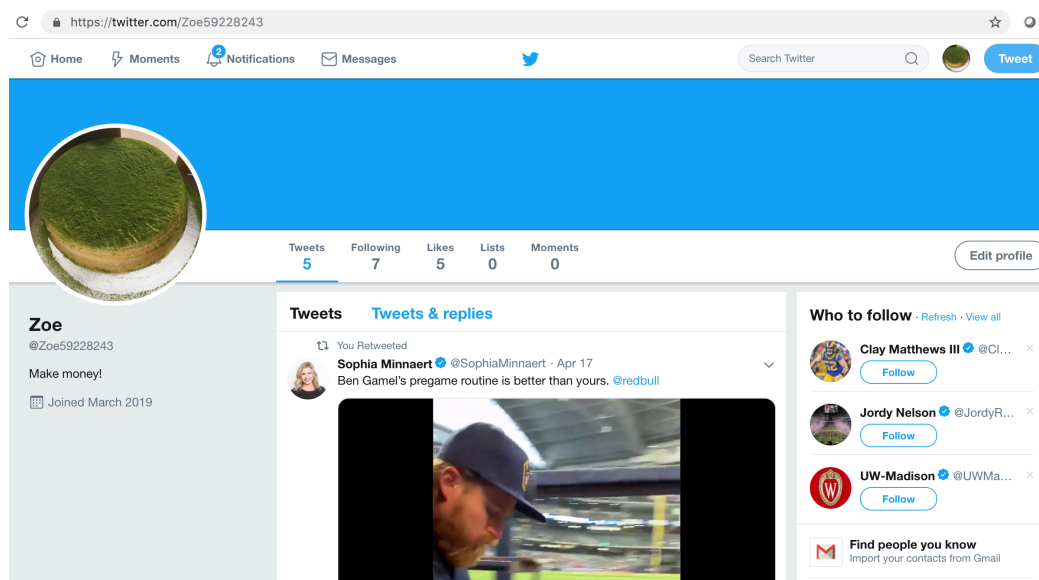Figure 12a. An Example of a Twitter User's Home Page

Figure 12b. An Example of a Twitter User's Profile

First, we selected a random sample of 1048 active Twitter users. For ten scattered time periods during a day, we used "stream_tweets" command to get a random sample of tweets (approximately 1%) from the live stream of all published tweets for 5 seconds. After screening out the tweets without meaningful words, we recorded the corresponding user IDs, removed duplicate IDs, and used "lookup_user" command to get account information. In order to only retain English tweets, we kept the users who specified "En" as their language in account information. In addition, there are many categories of users on Twitter, such as spammers, corporation users, celebrity users, and normal individual users (Zhou et al., 2016). Our focus is on normal individual users, who make up the majority of users and are more likely to have typical regret behavioral reactions. Twitter limits the number of friends a user can have to 5000, and an account must meet certain requirements to follow more than 5000 accounts. We removed the users who have more than 5000 friends or followers, since it's more probable that they are spammers, corporation users, or celebrity users. The number of sample users and their collection time are shown in Table 18.

Table 18. Number of Sample Users and Collection Time

Collection Time	Number of Users
2019-04-18 03:00:40	110
2019-04-18 05:02:39	95
2019-04-18 10:51:51	124
2019-04-18 13:00:46	104
2019-04-18 15:41:15	117
2019-04-18 16:17:37	103
2019-04-18 18:29:18	84
2019-04-18 21:21:00	102
2019-04-18 23:43:47	106
2019-04-19 01:46:34	103

Second, we collected sample users' profile information for 21 days from April 22th to May 12th, 2019. Only public accounts' information can be collected. For private account, warning message appeared during the data retrieving process. On each day at 0:00 am, we used "get_timeline" command to download users' most recent 400 statuses (i.e., tweets, retweets, and replies), since 400 statuses are enough to include all the statuses during the past 24 hours. There are eighty-eight variables collected for each status, including creation time, text, reply information, retweet information, quote information, mention, and etc. Then, only the statuses during the past 24 hours were selected to figure out who they interacted with and to what extent on a particular day. For each user, the longitudinal data for 21 days can be used to track the frequency he/she interacted with each friend, and to further infer his/her communication tendency and if he/she has muted or blocked someone. Since Twitter only allows to get 900 users' timeline for every 12 minutes, we wrote a new function to get unlimited users' timeline automatically. All the R codes are attached in Appendix C.

Third, we collected information on sample users' homepages from April 22th to May 12th, 2019. On each day at 0:00 am, the list of account IDs that each user followed was collected using "get_friends" command. We can only request the friends of fifteen users per fifteen minutes. After getting list of friends for each user, we downloaded his/her friends' most recent 50 statuses, because the retrieving time is too long, and 50 statuses are almost enough to include all the statuses during the past day. Then, only the statuses during a particular day were selected and sorted by time, and they were approximately the information available on a user's homepage. However, some

information may not be included, such as advertisement, and some may not be excluded accurately, such as statuses from the friends he/she muted. It took about nineteen hours to get one hundred users' information available on homepages. In our exploratory study, we decided to only collect lists of friends and information on homepages for a subsample of 100 users. Therefore, it reduced the sample size for hypothesis testing to 100.

Analysis and Results

We analyzed the Twitter data using R. One of the most powerful aspects of using R is that one can download free packages for many tools and various types of analysis.

Descriptive Statistics

Before testing the hypotheses, we provide descriptive statistics for the sample of 1048 users' basic profile features (Table 19). We observed that, overall, they are active users who have a long history of using Twitter. The term "status" includes all the activities a user involves, such as tweet, retweet, like, and reply. The number of mentions per status and the ratios of retweets and replies are high, which indicate that people like to interact with others on Twitter.

Table 19. Statistics for Sample Users' Profile Features

Features	Average	Standard Deviation
Number of friends	1006.088	1096.163
Number of followers	1022.69	1078.838
Number of statuses	55927	728001
Number of favorites	21172	41826
Profile age (number of days)	2384.16	1102.32
Frequency of statuses per day during the collection period	17.403	2.54
Number of mentions per status	1.07	1.79

Ratio of retweets	0.37	0.48
Ratio of replies	0.33	0.47

Hypotheses Testing

For the purpose of testing the relationship between information overload/cyberbullying and users' regret using social media, we need to examine whether or not they are prone to interact with people who perform information overload/cyberbullying behavior. The methods of interaction include mention, retweet, reply, and quote. During the data collection period, none of our sample users deactivated their Twitter account, and their number of friends were increasing. Thus, users' regret reaction towards information overload/cyberbullying can only be indicated by their "Block" or "Mute" actions, and those actions are reflected by the frequency they interact with their friends. For example, if a user never interacts with a friend who always posts a lot of statuses, then it means that he/she may have blocked or muted this friend. If a user interacts less with a friend than others, then it indicates that he/she tends to ignore this friend's information, which may induce a block or mute action at a later time.

Therefore, in order to test the relationship between information overload and regret, for each of the 100 users in our subsample, we created a table with a list of his/her friends' account ID in the first column. The second column reports his/her frequency of interaction (including mention, retweet, reply, and quote) with each friend, which is retrieved from his/her profile information. The third column reports average number of statuses per day contributed by each friend, which is retrieved from his/her information on homepage. We removed the friends who never posted anything during the data

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collection period since they would not affect the result. The fourth column reports the interaction rate, which calculates the ratio of frequency of interaction (2nd column) to number of statuses (3rd column). The interaction rate is a crucial indicator for users' communication preference, and it can reflect their regret behavioral reaction (i.e., Mute or Block actions). An example of the first seven rows of a user's report is shown in Table 20.

Then, we classify a user's friends into two groups: the friends who perform information overload behavior, and those who don't perform information overload behavior. The data distribution for frequency of statuses per day is approximately normal for large enough dataset, then about 68 percent of data are within one standard deviation of the mean. Based on the average and standard deviation of statuses per day in Table 19, about 16 percent of users have more than 20 (i.e., mean plus standard deviation) posts per day. Thus, in our study, users who post more than 20 statuses per day in average are considered as those who perform information overload behavior. In practice, posting more than 20 statuses per day could be overwhelming since each webpage or app screen can only show two to three statuses. Then, people need to scroll down more than seven times to go through one's information, which may cause information anxiety. Accordingly, we added a fifth column to each user's table to indicate his/her friends' information overload group (see Table 20).

Table 20. First Seven Records of a User's Interaction Data

Friends' Account ID	Frequency of Interaction	Average N of Statuses	Interaction Rate	Information Overload Group

33449838	0	4.21	0	1
757362706664067073	1	0.238	4.20	1
4700843113	1	12.33	0.081	1
1111046482382282752	0	0.048	0	1
24679214	5	50	0.1	2
61248987	0	49.36	0	2
24224561	3	13.41	0.224	1
…				

The results of two sample t-test can be used to determine whether there is a significant difference between the means of interaction rate of two information overload groups. Among the 100 users in our subsample, we removed seven users who posted less than five statuses during the data collection period (21 days), since their interaction rates are too low to get statistical significant results. Then, we performed t-test for each user in the subsample.

Among the 93 users in our subsample, there are 75 users that have no significant difference between the means of interaction rates of two information overload groups ($p > 0.05$), which indicates that they like to interact with all of their friends equally. For the rest of 18 users, the means of interaction rate for information overload group are significantly lower than those for non-information overload group ($p < 0.05$), which indicates that they are prone to interact more with their friends who post less statuses. We found nine of these 18 users' interaction rates are more than 0.1, which means for average ten statuses from their friends on their homepage, they have interactions with at least one of them. Their interaction rates are much higher than other users in our sample. In addition, eleven of these 18 users have average more than 20 statuses per day, which indicates that they are performing information overload behavior. It can support our

hypothesis that the availability of information overload can induce regret experience, so that they interact less with people who performing information overload behavior. Therefore, H1 is partially supported.

According to the different results described above, we classified the users into two groups and reported their group results as well as the results of some examples of individual users (see Table 21).

Table 21. Results of t Test for Information Overload

User Group	Mean of Overall Interaction Rate	Number of Users	Information Overload Group	Number of Friends	Mean of Interaction Rate	P value of t test
1	0.0027~0.06	75	Not Overload	30322	0.02982	0.2744
			Overload	5473	0.01369	
Individual Users in Group 1	0.024	-	Not Overload	532	0.02877	0.3588
			Overload	180	0.01184	
	0.054	-	Not Overload	156	0.05906	0.1775
			Overload	21	0.01888	
	0.0033	-	Not Overload	710	0.00313	0.7334
			Overload	120	0.00404	
	......					
2	> 0.055 (9 of them has >0.1)	18	Not Overload	12067	0.1125	0.0097**
			Overload	2365	0.0232	
Individual Users in Group 2	0.117	-	Not Overload	290	0.1365	0.0001***
			Overload	59	0.0197	
	0.096	-	Not Overload	181	0.1028	0.0103**
			Overload	14	0.0134	

0.085	-	Not Overload Overload	769 711	0.1108 0.0545	0.00899**
	……				

In order to test the relationship between cyberbullying and regret, for each of the 100 users in our subsample, we created a new table based on user's interaction data (Table 20). The first column still reports one's friends' account ID, and the second column reports his/her interaction rate with each friend. To target candidates for cyberbullying, we need to find the most hurtful statuses involving negativity or profanity (Dinakar et al., 2011). "Sentimentr" is a dictionary-based sentiment analysis R package that calculate text polarity sentiment at the sentence level. It includes "extract_sentiment_terms" and "extract_profanity_terms" functions to extract sentiment (positive and negative) words and profanity words from sentences. Each extracted word has its polarity index. Two examples of the outputs of extract_sentiment_terms are shown in Table 22 (see Appendix C for R code). Then, we calculate the overall polarity index for each friend's statuses. For the friends who have polarity smaller than zero, we categorize them into cyberbullying group. An example of the first seven rows of a user's cyberbullying report is shown in Table 23.

Table 22. Examples of Extract Sentiment Terms Output

Example 1

Status: "I love creating magic for the screen with this guy! mikealdengoode my partner in cinematic crime!! There are amazing things to come!!! #writing #magic #excited #youreagenius https://t.co/XBbacT4DSr"
Polarity Index: 2.55

	Words	*Polarity*	*n*

	Words	Polarity	n
Positive words	partner	0.80	1
	love	0.75	1
	excited	0.75	1
	amazing	0.50	1
	magic	0.25	2
Negative words	crime	-0.75	1

Example 2

Status: "Fake pictures. Fake videos. Fake stories. Fake history. \n\nIf Israel and her people were so evil, you wouldn't have to make stuff up all the damn time!"
Polarity Index: -4.5

	Words	*Polarity*	*n*
Positive words	-	-	-
Negative words	fake	-0.75	4
	evil	-0.75	1
	damn	-0.75	1

Table 23. First Seven Records of a User's Cyberbullying Data

Friends' Account ID	Interaction Rate	Polarity Index	Cyberbullying Group
33449838	0	2.55	2
757362706664067073	4.20	0.45	2
4700843113	0.081	5.95	2
1111046482382282752	0	-0.3	1
24679214	0.1	-18.8	1
61248987	0	-65.65	1
24224561	0.224	15.15	2
…			

The results of two sample t-test can be used to determine whether there is a significant difference between the means of interaction rate of two cyberbullying groups. Among the 93 users in our subsample (after removing seven users who posted less than five statuses during the data collection period), there are 84 users that have no significant difference between the means of interaction rates of two cyberbullying groups ($p > 0.05$), which indicates that they like to interact with all of their friends equally. For the rest of

nine users, the means of interaction rate for cyberbullying group are significantly lower

than those for non-cyberbullying group ($p < 0.05$), which indicates that they are prone to

interact more with their friends who don't perform cyberbullying behavior. It can support

our hypothesis that the availability of cyberbullying can induce regret experience.

Therefore, H2 is partially supported.

According to the different results described above, we classified the users into

two groups and reported their group results as well as the results of some examples of

individual users (see Table 24).

Table 24. Results of t Test for Cyberbullying

User Group	Number of Users	Cyberbullying Group	Mean of Interaction Rate	P value of t test
1	84	Not Bullying Bullying	0.0246 0.0218	0.8275
Individual Users in Group 1	-	Not Bullying Bullying	0.0226 0.0427	0.4247
	-	Not Bullying Bullying	0.0397 0.0292	0.7523
	-	Not Bullying Bullying	0.0854 0.0833	0.9256
	……			
2	9	Not Bullying Bullying	0.0473 0.00851	0.0433*
Individual Users in Group 2	-	Not Bullying Bullying	0.0595 0.00299	0.0484*
	-	Not Bullying Bullying	0.0637 0.0112	0.0320*
	……			

Discussion

The results of our exploratory study show that the availability of information overload has a positive influence on some users' regret using social media, especially for the users who perform information overload behavior or have higher interaction rate. It may because these users have more data about their statuses and interactions (i.e., bigger sample size), then it is easier to detect their behavior patterns and be interpreted with higher statistical power. Even though most users in our sample would like to interact with all their friends equally, it is reasonable since not all people feel bad about information overload behavior. They may look at Twitter website or app less than others, then they are easily to get more attention on the friends who post more things on it. They may also like to acquire information from the news accounts (e.g., CNN) and express their opinions rather than make friends using Twitter. Furthermore, there is no user that tend to interact more with friends who perform information overload behavior.

The results of our exploratory study can partially support the relationship between the availability of cyberbullying and users' regret using social media. Nine out of 93 users are prone to interact more with their friends who don't perform cyberbullying behavior. There is no user that tend to interact more with friends who perform cyberbullying behavior. However, most users would like to interact with all their friends equally. Several reasons may account for the results. First, sometimes we cannot only use a sentence's negativity or profanity to determine cyberbullying. The topics that are personal and sensitive are most hurtful and should only be considered as cyberbullying (Dinakar et al., 2011). Thus, we should decompose the detection of cyberbullying into

sub-problems involving both text classification and sentiment analysis. In text classification, we need to train binary classifiers to ascertain if an instance can be classified into a sensitive topic or not. Second, users' regret experience is influenced by their personality differences and demographic differences. People who perform cyberbullying behavior are less sensitive to negative behaviors. Then, if we classify the users themselves into cyberbullying and non-cyberbullying groups, we may find some interesting results. Third, when calculating overall polarity index, positive words' polarity may not be calculated and added. Because sometimes many good words still cannot remedy the harmfulness of one bad word.

CHAPTER VIII

DISCUSSION

Theoretical Contributions

The dissertation makes several important contributions to the literature. First, we contribute to the IS literature by identifying antecedents to social media discontinuance. Despite the prevalence of research to understand the adoption and usage phases of information systems life cycle, extant studies have yielded scant evidence on the causes of the termination stage, especially in the social media context. Previous study on social media discontinuance aimed to explain users' intention to switch social media providers, which is much different from our goals. We argue that satisfaction alone lacks sufficient power to fully explain behavioral intentions. We recognize that regret can directly influence behavioral intentions as well. Regret is a construct not adequately addressed in IS research arena, but widely studied in theoretical economics and marketing. Based on the regret model in consumer decision making (Tsiros and Mittal, 2000), this dissertation develops a comprehensive model to explain social media discontinuance intention. In our model, higher levels of regret increase dissatisfaction, and regret and dissatisfaction have a positive influence on discontinuance intention.

Second, we associate the dark side of social media with regret. This finding is vital because there is no existing study identifying the antecedents of social media regret and further relating regret with the dark side of social media. IS research community is

beginning to consider negative effects of IT use as an important area, and some research has examined the causes and negative consequences of some specific negative effects of social media use. However, none of them has attempted to integrate the various aspects of the dark side of social media and their influence on social media regret and discontinuance intention. In this dissertation, we elicit five salient negative effects of social media use based on qualitative study (i.e., cyberbullying and arguing, misinformation, information overload, misuse, and online social stress) to explain social media regret.

Third, we identify several moderators for the relationship between the dark side of social and regret. This is the very first study that includes privacy control and tie strength to moderate the relationship between dark side of social media and regret. Privacy control is especially important in the social media context, because users take high risks in the disclosure of personal information and need more privacy protections. The results show that privacy control amplifies the relationship between dark side of social media and regret, which counters our hypothesis. When the frequency and extent users suffered from dark side is low, they are more likely to have regret experience if they have lower privacy control; when the frequency and extent they suffered from dark side is high, they are more likely to have regret experience if they have higher privacy control. In addition, tie strength, which refers to the frequency and depth with which two people interact, is one of the most commonly used measures of digital relations in social network analysis. However, there is no empirical study examining how tie strength may exaggerate or mitigate the impacts of the dark side of social media. The results show that tie strength

dampens the relationship between dark side and regret. When users suffer from the same level of bad behaviors, they experience a lower level of regret if the tie strength between perpetrator and themselves is stronger.

Fourth, we use both qualitative and quantitative research methods to provide rich insights into social media users' regret experience and discontinuance intention. Furthermore, we also collect both primary and secondary data to examine the relationship between dark side of social media and regret experience, which can further validate the testing of our hypotheses. Again, there is no previous study using secondary data to investigate the negative consequences of dark side of social media.

Overall, we advance the theory on IS discontinuance by proposing and testing propositions, especially from the social media perspective. Specifically, we combine theoretical perspectives from literature in consumer behavior, dark side of social media, social network analysis, to information privacy.

Practical Implications

In practice, our findings can benefit both providers and users of social media technologies. In the past several years, social media providers have been trapped in difficult situations because of social media users' discontinuance behavior. The fever towards social media technologies is cooling down, and many users have started to abandon their accounts. Meanwhile, many startups have been built around the world each year, which makes the competition within the market even fiercer. Providers have tried to develop new features to attract more new users and keep existing users, but these strategies still cannot stop users' discontinuance behavior effectively. It is because the

features to keep existing users may be different from those to attract new users. After the feeling of novelty has passed, social media platforms should afford the users capabilities to decrease their experience of regret and dissatisfaction. Furthermore, social media users' usage patterns have dramatically changed over the past several years. They are becoming more careful when they post personal information on social media sites, and they tend to contribute less but share and read more. Thus, the findings of the dissertation will provide new notions on how to develop features to reduce discontinuance intention and behavior. For example, firms may want to develop new ways to induce more interaction, or to design content filters to eliminate negative content. The findings about privacy control also indicates that social media platforms should design an optimal level of privacy control for users. Higher privacy control doesn't necessarily work better. Greater privacy protections could limit the resources available to a user, which have a negative effect on performance outcomes.

Social media discontinuance research is also important to users, because people have typically invested considerable resources and time on the use of a social media platform, and they have adapted work and daily life routines on the basis of their social media use. Thus, social media discontinuance can result in wastage of resources and changes in behavior patterns. Our study can raise awareness of the negative aspects of social media use. From our findings, users can identify factors that inhibit or promote their interaction patterns with social media, and thus make informed decisions about their involvement with social media platforms.

CHAPTER IX

LIMITATIONS AND FUTURE RESEARCH

Limitations

Although we are designing the study to provide high quality results, every study exhibits some limitations. One of the limitations of the study is there are two latent moderating factors in the research model. SEM using SPSS Amos software do not function well with complex models, since they require extremely high sample sizes (i.e., 500+ respondents). To test the moderating effects, we use data imputation to replace the items of each latent variable to a single composite item.

Second, we rely primarily on survey research to test the research model. While survey research is useful and widely used in the IS discipline, it has its own limitations. One of the limitations is common method variance which can be the result of reliance on self-reported measures. Another limitation is that surveys are not always representative of the larger population unless random sampling is used. In many studies, diversity in respondents is used as an alternative to random sampling.

Third, in the second study, the overall tie strength construct was estimated using average tie strength of the five issues of dark side of social media. We didn't measure overall tie strength directly in the survey, since it should be examined based on the interactions between two sides of people, and it must happen in the situations that both perpetrator and victim of bad behaviors exist.

Fourth, in the third study, the sample size of our exploratory study is relative small. The results of our exploratory study cannot fully support the relationship between the availability of cyberbullying/information overload and users' regret using social media. A bigger sample size is needed to finish a confirmatory study. The method to test the relationship between cyberbullying and regret should be improved. For example, we should decompose the detection of cyberbullying into sub-problems involving both text classification and sentiment analysis. In text classification, we need to train binary classifiers to ascertain if an instance can be classified into a sensitive topic or not.

Future Research

First, more Twitter data can be collected to examine the relationship among dark side of social media, tie strength, and users' regret experience. We didn't include tie strength construct in our exploratory study, and how tie strength moderates the relationship between dark side and regret is still worth exploring. Tie strength, which is the frequency and depth with which two people interact, can be measured using the data on the users' communications and interactions. Other text mining techniques can be used to analyze the secondary data.

Second, research can continue to examine other factors beyond the dark side of social media that influence social media regret and discontinuance intention. In addition, with the development in social media mobile applications, the issues of the dark side of social media have increased and intensified. Future research can elicit other negative effects of social media use and examine how they may influence discontinuance intention.

Third, research can be done to examine regret and discontinuance in other settings, such as other countries and culture contexts. IS researchers have studied the impact of national level of culture on IT issues. Using the conceptualization of Hofstede's national culture taxonomy (1980; 2010), we can examine different behaviors of social media users from various national culture. An example of hypotheses may be "when experiencing the same level of dark side of social media, users from high uncertainty avoidance countries are more likely to have a higher level of regret", because a low uncertainty avoidance degree means people in this society tend to tolerate different opinions, including some issues of dark side of social media. Both survey data and Twitter data can be collected from users from different countries.

Fourth, the positive and negative sides of social media use can be considered at the same time (Mantymaki and Islam, 2016). Research can be done about the dual face of social media. When considering the positive side of social media, uses and gratification theory can be used to help understand the motivation behind increased social media engagement (Chiu and Huang, 2015; Katz et al., 1973).

Fifth, more social media analytics on other topics can be done using the collected Twitter data. For example, an audience selection framework can be proposed for online brand advertising based on user activities; a better content filter can be designed to eliminate issues of dark side of social media to a large extent.

Finally, future research can continue to develop a model to predict social media technology life cycle. Just like product life cycle, social media technology may have a similar pattern of life cycle. Researchers may be able to develop mathematical/simulation

models to simulate the user's behavior, and use relevant parameters to predict the growth time, maturity time, and decline time of the number of active users on a social media platform.

CHAPTER X

CONCLUSION

Despite the popularity of social media technologies, people spent less time on social media sites and their usage patterns changed dramatically in the past several years. The dissertation provides an exploration and explanation of social media discontinuance behavior. Regret, which is widely investigated in theoretical economics and marketing research to predict behavioral intention, is introduced to predict social media users' discontinuance intention.

The dissertation is composed of three parts. The first part is a theory building paper to propose and refine the research model. It includes an interpretive exploration to understand the discontinuance behavior, define regret in social media context, and elicit factors that can influence users' social media regret and discontinuance intention. Regret is hypothesized to be influenced by negative aspects of social media use, including cyberbullying & arguing, misinformation, information overload, misuse, and online social stress. Regret can further influence dissatisfaction and discontinuance intention. In addition, the relationship between negative aspects of social media and regret is moderated by privacy control and tie strength.

The second part is a positivist survey examining the research model from first part. The results show that dark side of social media as a second-order factor

incorporating five first-order factors, has a positive effect on regret; both regret and dissatisfaction have positive effects on discontinuance intention, and the effect size of regret on discontinuance intention is larger than dissatisfaction. The results also show that privacy control amplifies the relationship between dark side of social media and regret, which counters our hypothesis.

The third part is a positivist study using secondary data from Twitter to examine the relationship between dark side of social media (i.e., information overload, cyberbullying) and users' regret experience. The results of our exploratory study show that the availability of information overload has a positive influence on some users' regret using social media, especially for the users who perform information overload behavior or have higher interaction rate. The relationship between the availability of cyberbullying and users' regret using social media is also partially supported.

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APPENDIX A

INTERVIEW QUESTIONS

Background

Social media is defined as forms of electronic communication through which people create online communities to share information, ideas, and personal messages. Examples of the most popular social media sites in 2017 were Facebook, Twitter, LinkedIn, Google+, YouTube, Pinterest, and Instagram. Despite the popularity of social media technologies, many people spent less time on social media sites and their usage patterns changed dramatically in the past several years. This study aims to provide an exploration and explanation of social media users' change of usage patterns. What's more, social media providers attempted to keep existing users by adding new features to their sites. But obviously, these strategies still can't stop users' discontinuance behavior (i.e., stop using social media sites) effectively as was expected. The interview questions are as follows:

Theme 1: General questions related to social media usage behavior. Elicit factors that influence the change of usage behavior.

1. Please provide your demographic information: Gender, Age range, Education
2. What social media sites have you used? Have you tried to stop using some of them? If any, why did you stop using them? Have you tried to stop using any of them for a while, and then started using it again? Why did you use it again?
3. Which one is your favorite social media site (*we will use FS to represent your favorite site in the following questions*)? Recently, what things do you like to do when you use the FS? What contents do you like to post? How long do you spend on it each day?
4. Do you see yourself any changes in the way of using the FS over time (i.e., how the activities or sharing behaviors changed when you use the FS)? How and why you have these changes?
5. What makes you keep using the FS? What benefits do you perceive from using it?

Theme 2: Define regret in social media use context. Elicit factors that may influence users' regret of using social media.

1. Please describe the contents or activities you don't like most from social media sites.
2. Have you had any regret feelings (i.e., feel disappointed, feel like should have never used it) when you use any social media sites? Please answer one of the (a)(b) questions.
   (a) If yes, can you describe the regret feeling in more detail? Please describe the experiences (or unpleasant posts, comments) that made you have regret feeling.
   (b) If no, do you have any other negative feelings even if it was not regret? Please describe the feelings in more detail. Please describe the experiences (or unpleasant posts, comments) that made you have these negative feelings.

3. What did you usually do when you have regret or any other negative feelings (e.g., delete contents, deactivate account, defriend people, etc.)? Please describe several reactions and corresponding scenarios.
4. Did you feel bad when you experience the following contents or activities? Make an example if you have related experience and describe how you feel.
   (a) Under surveillance or evaluation of others based on the personal information you shared.
   (b) Cyberbullying/arguing from others.
   (c) Experiencing narcissism of others (showing off), or enduring social comparison and jealousy.
   (d) Information overload (i.e., too many information), or managing annoying content:
5. Did you feel worse when you hurt other people or when you are hurt on the social media sites?

Theme 3: Elicit factors that may mitigate users' regret or dissatisfaction of using social media.

1. What features or settings of social media sites can help you mitigate the negative effects or feelings? Why?
2. Do you think appropriate privacy control can mitigate the negative effects or feelings? How do you protect your privacy on social media sites (e.g., manage audience list, etc.)?
3. Why do you prefer using the FS than other social media sites (e.g., in terms of contents, community, features, etc.)?
4. Do you feel different when you experience bad behaviors (comments, posts, etc.) online from your intimate friends compared with not so close friends or strangers? Please make an example and describe your feelings and reactions. Can you think of possible reasons?

Conclusion questions:

1. Do you think you will continue to use social media sites at the present level, or will you reduce or discontinue its use?
2. What are your expectations (e.g., add any features) of social media sites?
3. Is there anything else you would like to share about the negative effects of social media sites?

INITIAL SURVEY INSTRUMENT

Construct	Source, Context, Instrument	**My instrument**
Discontinuance Intention	(Turel, 2015; Social networking website) I intend to stop using this social networking website in the next 3 months. I predict I would stop using this social networking website in the next 3 months. I plan to stop using this social networking website in the next 3 months.	I intend to stop using this social media site in the near future. I plan to stop using this site in the near future. I predict I would stop using this site in the near future.
Regret	(Liao et al., 2017; Online shopping) I feel sorry for choosing to shop at the e-store. I regret choosing to shop at the e-store. I should have chosen to shop at another e-store.	I regret choosing to use this social media site. I feel sorry for using this site. I should have never used this site.
Dissatisfaction	(Xu et al., 2015; SNS) The site does not provide enough information that I need. How do you feel about the reliability of information on this site? The organization of information on this site is (extremely clear – extremely unclear). The information on this site is (extremely useful – extremely useless). To what extent are you dissatisfied with the applications provided by this site? I cannot communicate with my friends effectively through this site.	This site does not provide useful information that I need. This site does not provide reliable information that I need. This site does not provide functions or applications that I need. This site does not provide a good online network for my needs. I am dissatisfied with this site.

Habit	(Turel, 2015; Social networking website) Using this social networking website has become automatic to me. Using this social networking website is natural to me. When I want to interact with friends and relatives, using this social networking website is an obvious choice for me.	Using this site has become automatic to me. Using this site is natural to me. When I am bored or have spare time, opening this site is an obvious choice for me.
Valence (Hedonic Evaluation)	(Hu et al., 2015; Social media) It is fun to use this online social network. It is a lot of enjoyment to use this online social network. It is exciting to use this online social network. Using this online social network satisfies my curiosity about people and social activities.	It is fun to use this site. It is a lot of enjoyment to use this site. It is exciting to use this site. Using this site satisfies my curiosity about people and social activities.
Valence (Utilitarian Evaluation)	(Hu et al., 2015; Social media) Searching for information about people and social activities is an excellent benefit of using this online social network. Acquiring information from people is an excellent benefit of using this online social network. Learning information about people and social activities is an excellent benefit of using this online social network. Gaining information about people and social activities I will use is an excellent benefit of using this online social network.	Searching for information about people and social activities is a great benefit of using this site. Acquiring information from people is an excellent benefit of using this site. I like to use this site to learn information about people and social activities. This site provides useful functions and applications that I need.
Valence (Relational Evaluation)	(Hu et al., 2015; Social media) Staying in touch with people is a great benefit of using this online social network. Maintaining relationships with people is a great benefit of using this online social network.	Using this social media site makes it easier to stay in touch with my friends. Using this social media site helps me stay updated on how my friends are doing.

	Interacting with people is a great benefit of using this online social network. Keeping connected with people is a great benefit of using this online social network. (Islam et al., 2019; SNS) INTER1: Using Facebook makes it easier to stay in touch with my friends. INTER2: Using Facebook helps me stay updated on how my friends are doing. INTER3: Using Facebook helps me get information about people (I know or I would like to know).	I like to use this site to interact with people. Keeping connected with people is a great benefit of using this site.
Privacy Control (Permeability)	(Child et al., 2009; Blogging privacy disclosure) When I face challenges in my life, I feel comfortable talking about them on my blog. I like my blog entries to be long and detailed. I often tell intimate, personal things on my blog without hesitation. I share information with people whom I don't know in my day-to-day life.	I can avoid the information that I don't like on this site. I filter certain content posted on this site that I don't want to see. When I have something important happened in my life, I feel comfortable talking about them on this site.
Privacy Control (Ownership)	(Child et al., 2009; Blogging privacy disclosure) I have limited the personal information posted on my blog. If I think that information I posted really looks too private, I might delete it. I usually am slow to talk about recent events because people might talk. I don't blog about certain topics because I worry who has access. Seeing intimate details about someone else, makes me feel I	If I think that information I posted really looks too private or too bad, I might delete it. I hesitate to say something about certain topics on this site because I worry who has access. I have control over the spread of my personal information on this site. Seeing intimate details about someone else, makes me feel I

	should keep their information private.	should keep their information private.
Privacy Control (Linkage)	(Child et al., 2009; Blogging privacy disclosure) I create a profile on my blog so that other bloggers can link to me with similar interests. I try to let people know my best interest on my blog so I can find friends. I comment on blogs to have others check out my blog. I allow access of my blog through any of these: directories, key word searches, or weblog rings. I regularly link to interesting websites to increase traffic on my blog.	I try to let people know my best interest on this site so that I can find friends. I classify my online friends into groups so that I can manage the sharing of information based on different groups on this site. I only share personal information with my friends on this site. I sometimes defriend or block people to protect my personal information.
Cyberbullying & Arguing	(Hinduja and Patchin, 2008; Kokkinos et al., 2016) Online bullying can include: bothering someone online, teasing in a mean way, continued to send insulting messages, posting messages to damage the person's reputation, spreading other's secret without permission, intentionally leaving persons out of things, threatening someone, and sending unwanted sexually-related things to someone. Have you ever been bullied online? Have you ever been threatened or scared for their safety because of something someone said to them?	I have been insulted, bothered, or teased in a mean way on this site. I have been threatened on this site. I have been sent unwanted sexually-related things on this site. I have been left out of things on this site. I have argued or debated with others in an angry way on this site.

Misinformation	Generate from interview analysis Please evaluate how often do you engage in the following activities (Islam et al., 2019)	I have seen some false or inaccurate information on this site. This site increases the spread of fake news. I cannot differentiate between fake news, real news, and opinion news on this site. I have seen people spreading fake news to reach their malicious goals on this site.
Information Overload	(Kefi and Perez, 2018; Online social networks) I receive too much information on Facebook that I cannot fully process. Using Facebook requires me to do a lot of information processing tasks. Since I am using Facebook, the amount of information I have to deal with is exponentially increasing. Since I am using Facebook, the amount of undesired information I am receiving has increased.	I have received too much information on this site that I cannot fully process. Using this site requires me to do a lot of information processing tasks. Since I used this site, the amount of undesired information I received has increased. I have seen too much redundant information on this site, which made it difficult to find the right information.
Misuse	Generate from interview analysis (Marshall, 2012; FB surveillance of former romantic partners) How often do you look at your ex-partner's Facebook page? How often do you look at your ex-partner's list of Facebook friends? (Lee, 2014) Social surveillance is a form of focused, systematic and routine personal information seeking about others, which could	My account for this site was hacked before. My information on this site has been sold to third parties (e.g., advertisement company) without my permission. My information on this site has been used for other purposes without my authorization.

	stem from the desire to stay updated on what is happening in one's circle of friends. (Privacy secondary use instrument)	My personal information has been sought frequently and systematically by others on this site.
Online Social Stress	Generate from interview analysis (Ayyagari et al., 2011; strain, technostress) I feel drained from activities that require me to use ICTs. I feel tired from my ICT activities. Working all day with ICTs is a strain for me. I feel burned out from my ICT activities.	I feel tired as I have to comply with my online communities' conventions. I get pressured as I see others are doing perfect things and better things than me. I feel burned out if my messages are misunderstood, which lead to embarrassing situations. It is a strain for me when people use "likes" and "followers" evaluate my postings.
Tie strength	(Levin and Cross, 2004; Knowledge transfer) How close was your working relationship with each person? (Very close – distant) How often did you communicate with each person? (Daily – once a month – never) To what extent did you typically interact with each person? (To no extent – to a very great extent)	How close was your online relationship with the person who engaged in bullying behavior? (Very close – distant) How often did you communicate with the person who perform this behavior? (Daily – never) To what extent did you typically interact with the person who perform this behavior? (To no extent – to a very great extent)

FINAL SURVEY INSTRUMENT

Part 1: Demographic Information
1. Gender:
  Male   Female

2. Age in years:
  18-25   26-35   36-45
  46-55   More than 55 years
  If you are UNDER 18 years of age, please do NOT complete this survey.

3. Currently, what is your highest level of education:
  High School   Some years of college or Vocational school

  Bachelors' degree   Master's or Doctorate

4. Please choose the option that best describes your current occupation status:
  Full time Employee   Part time Employee Self-employed
  Full time College Student Retired/ Homemaker Other: _____

5. Please indicate your annual household income:
  Less than $20,000 $20,001 to $50,000 $50,001 to $80,000
  $80,001 to $100,000   More than $100,000

6. Which social media site did you most frequently use during the past 5 years?
Please name one: _____
Please answer the rest of questions based on your experience with the social media site you named above.

7. On average, how many minutes each day did you use this social media site for the last 3 months?
  Less than 10 minutes   10 to 30 minutes   30 minutes to 1 hour
  1 to 3 hours   More than 3 hours

8. On average, how often did you check this site for the last 3 months?
  Less than once a week   Less than once a day   1-2 times each day
  3-5 times each day   Many times (>5) each day

9. How long have you used this site?

     Less than 2 months   2 to 12 months   12 to 24 months

     24 to 48 months   More than 48 months

Part 2: Please indicate the extent to which you agree or disagree with each statement by circling the appropriate choice. (1 = strongly disagree; 5 = strongly agree).

(Control variables)
My life has been relatively normal during the last 6 months.
Using this social media site is automatic to me.
When I am bored or have spare time, opening this site is an obvious choice for me. *

(Regret)
(Regret_1) Sometimes I feel I should have never used this site.
(Regret_2) I regret choosing to use this social media site.
(Regret_3) I have felt regret (or sorry) using this social media site.

(Dissatisfaction)
(Satis_1) This site does not provide useful information.
*(Satis_2) This site does not provide functions or applications that I need. **
(Satis_3) This site does not provide a good online network for my needs.
(Satis_4) I am dissatisfied with this site.

(Valence of using social media)
(Hedonic_1) It is fun to use this site.
(Hedonic_2) Using this site satisfies my curiosity about people and social activities.
(Utilitarian_1) Searching for information about people and social activities is a great benefit of using this site.
(Utilitarian_2) I like to use this site to learn information about people and social activities.
(Social_1) Using this social media site makes it easier to stay in touch with my friends.
(Social_2) Using this social media site helps me stay updated on how my friends are doing.
(Social_3) I like to use this site to interact with people.

(Privacy control)
(Permea_1) When I have something important happening in my life, I feel comfortable talking about them on this site.
(Permea_2) I can avoid looking at information that I don't like on this site. *
(Permea_3) I filter certain content posted on this site that I don't want to see. *
(Permea_4) Seeing intimate details about someone else, makes me feel I should keep their information private.

(Owner_1) If I think the information that I posted is too private or too bad, I am able to delete it.
(Owner_2) I hesitate to say something about certain topics on this site because I worry who has access.
(Owner_3) I have control over the spread of my personal information on this site. *
(Link_1) I try to let people know my best interests on this site so that I can make/connect with friends.
(Link_2) I classify my online friends into groups so that I can better manage the sharing of information. *
(Link_3) I only share personal information with my friends on this site.
*(Link_4) I sometimes defriend or block people in order to protect my personal information. **

(Discontinuance intention)
(Intention_1) I intend to stop using this social media site in the near future.
(Intention_2) I plan to stop using this site in the near future.

Part 3: Please check the most appropriate response in the following five scenarios.
(1 = not at all / strongly disagree; 5 = to a very large extent /strongly agree)

1. Answer all the following questions related to *Online Bullying* scenario:
(Bullying_1) I have been insulted, bothered, or teased in a mean way on this site.
(Bullying_2) I have been threatened on this site.
(Bullying_3) I have been sent unwanted sexually-related material on this site.
(Bullying_4) I have been left out of things on this site.
(Bullying_5) I have argued or debated with others in an angry way on this site.

(Tie strength for online bullying)
(Tie_1) How close was your online relationship with the person who engaged in bullying behavior? (Distant - Very close)
(Tie_2) How often did you communicate with the person who engaged in bullying behavior? (Never - Daily)

2. Answer all the following questions related to *Misinformation* scenario:
(Misinfo_1) I have seen some false or inaccurate information on this site.
(Misinfo_2) This site increases the spread of fake news.
(Misinfo_3) I cannot differentiate between fake news, real news, and opinion news on this site.
(Misinfo_4) I have observed people spreading fake news to reach their goals on this site.

(Tie strength for spreading misinformation)
How close was your online relationship with the person who engaged in spreading misinformation behavior?

How often did you communicate with the person who engaged in spreading misinformation behavior?

3. Answer all the following questions related to *Information Overload* scenario:
(Overload_1) I have received too much information on this site that I cannot fully process.
(Overload_2) Using this site requires me to do a lot of information processing tasks.
(Overload_3) Since I used this site, the amount of undesired information I received has increased.
(Overload_4) I have seen too much redundant information on this site, making it difficult to find the right information.

(Tie strength for information overload)
How close was your online relationship with the person who engaged in information overload behavior?
How often did you communicate with the person who engaged in information overload behavior?

4. Answer all the following questions related to *Information Misuse* scenario:
(Misuse_1) My account for this site was hacked before.
(Misuse_2) My information on this site has been sold to third parties (e.g., advertisement company) without my permission.
(Misuse_3) My information on this site has been used for other purposes without my authorization.
(Misuse_4) My personal information has been sought frequently and systematically by others on this site.

(Tie strength for misuse)
How close was your online relationship with the person who engaged in misuse behavior?
How often did you communicate with the person who engaged in misuse behavior?

5. Answer all the following questions related to *Online Social Stress* scenario:
(Stress_1) I feel tired as I have to comply with my online communities' conventions.
(Stress_2) I get pressured as I see others are doing better things than me.
(Stress_3) I feel burned out if my messages are misunderstood, leading to embarrassing situations.
(Stress_4) It is a stressful for me when people use "likes" and "followers" to evaluate my postings.

(Tie strength for online social stress)
How close was your online relationship with the person who brought online social stress to you?
How often did you communicate with the person who brought online social stress to you?

```
/* Function for getting unlimited users' timeline*/
get_timeline_unlimited <- function(users, n){
  if (length(users) ==0){
    return(NULL)
  }
  rl <- rate_limit(query = "get_timeline")
  if (length(users) <= rl$remaining){
    print(glue("Getting data for {length(users)} users"))
    tweets <- get_timeline(users, n, check = FALSE)
  }else{
    if (rl$remaining > 0){
      users_first <- users[1:rl$remaining]
      users_rest <- users[-(1:rl$remaining)]
      print(glue("Getting data for {length(users_first)} users"))
      tweets_first <- get_timeline(users_first, n, check = FALSE)
      rl <- rate_limit(query = "get_timeline")
    }else{
      tweets_first <- NULL
      users_rest <- users
    }
    wait <- rl$reset + 0.1
    print(glue("Waiting for {round(wait,2)} minutes"))
    Sys.sleep(wait * 60)
    tweets_rest <- get_timeline_unlimited(users_rest, n)
    tweets <- bind_rows(tweets_first, tweets_rest)
  }
  return(tweets)
}

/* Get target users' timeline for the day of April 22, 2019*/
user_timeline<- get_timeline_unlimited(userid, n=500)
d<- 0; j<- 1
for (i in 1:length(user_timeline$created_at)) {
  if (user_timeline$created_at[i]>1555891200 & user_timeline$created_at[i]<1555977600)
    {  d[j]<-i; j=j+1  }
  }
usertl_apr22<-user_timeline[d,]

/* Get a list of 100 target users' homepage for the day of April 22, 2019 */
```

```
friend_list <- get_friends(userid, retryonratelimit = TRUE)
friend_timeline <- list()
base <- 0
for (i in 1:100) {
  usern <- nrow(friend_list[friend_list$user == userid[i], ])
  friend_id <- friend_list$user_id[(1+base) : (usern+base)]
  friend_timeline[[i]]<- get_timeline_unlimited(friend_id, 500)
  base <- usern+base
}

friendtl_apr22 <- list()
for (i in 1:100)  {
  transvector <- friend_timeline[[i]]
  d <- 0; j <- 1;
    for (k in 1:length(transvector$user_id)) {
    if (transvector$created_at[k]>1555891200 & transvector$created_at[k]<1555977600)
      {d[j] <- k; j = j+1}
    }
  transvector1 <- transvector[d,]
  friendtl_apr22[[i]] <- transvector1[rev(order(transvector1$created_at)),]
}


R Code for Hypotheses Testing

/* Information Overload */

table1<-matrix(-1, nrow=263, ncol=4)
table1[,1]<-friendd5$user_id[c(1:263)]
a1<-friendtl_apr26later[[1]]
a2<-friendtl_may2later[[1]]
a3<-friendtl_may7later[[1]]
a4<-friendtl_may12later[[1]]
a<-rbind(a1, a2, a3, a4)
for (i in 1:263) {
    table1[i,2] <- nrow(a[a$user_id == table1[i,1],])/4
    }

/* for cyberbullying */
for (i in 1:190) {
    friend<- a[a$user_id == cyber_usern1[i,1],]$text
    sentiwords<- extract_sentiment_terms(friend)
    senticounts<- attributes(sentiwords)$counts
```

```r
    cyber_usern1[i,5] <- sum(senticounts[polarity<0,]$polarity *
senticounts[polarity<0,]$n) + sum(senticounts[polarity>0,]$polarity *
senticounts[polarity>0,]$n)
      }
/* end of cyberbullying */

d<- 0; j<- 1
for (m in 1:length(user3tl_alldays$user_id)) {
   if (user3tl_alldays$user_id[m] == userid3[1])
   {d[j] <- m; j = j+1}
}
usern1_alltl <-  user3tl_alldays[d,]

m1<-usern1_alltl$mentions_user_id
m2<- unlist(m1, use.names=FALSE)
q1<- usern1_alltl$quoted_user_id
q2<- unlist(q1, use.names=FALSE)
mq<-c(m2,q2)
for (i in 1:263) {
     table1[i,3] <- length(which(mq==table1[i,1]))
     }
for (i in 1:263) {
     table1[i,4] <- as.numeric(table1[i,3])/as.numeric(table1[i,2])
     }

/*remove 0 entries*/
d<- 0; j<- 1
for (i in 1:263) {
   if (table1[i,2] == 0)
   {d[j] <- i; j = j+1}
}
t1 <- table1[-d,]
t2<- t1[order(as.numeric(t1[,2])),]
overload_usern1<-t2

t.test(as.numeric(t2[c(1:156),4]),as.numeric(t2[c(157:190),4]))
mean(as.numeric(overload_usern1[,4]))
```