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The Dark Side of Using Online Social Networks:
A Review of Individuals' Negative Experiences

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ABSTRACT

Research on online social networks (OSNs) has focused overwhelmingly on their benefits and potential, with their negative effects overlooked. This study builds on the limited existing work on the so-called 'dark side' of using OSNs. The authors conducted a systematic review of selected databases and identified 46 negative effects of using OSNs from the users' perspective, which is a rich spectrum of users' negative experiences. This article then proposed nomenclature and taxonomy for the dark side of using OSNs by grouping these negative effects into six themes: cost of social exchange, cyberbullying, low performance, annoying content, privacy concerns, and security threats. This study then conducted structured interviews with experts to confirm the sense-making and validity of the proposed taxonomy. This study discusses the confirmed taxonomy and outlines directions for future research.

KEYWORDS

Adverse Consequences, Dark Side, Negative Effects, Online Social Networks

INTRODUCTION

The dark side of information technology (IT), specifically online social networks (OSNs), is important for information systems (IS) research and has become a more salient issue in recent years (Delpechitre et al., 2019; Polites et al., 2018; Turel et al., 2018). The dark side of IT use has been described as the negative effects of IT use on individuals, such as controversies, risks and other adverse consequences (Silic & Back, 2016). However, there is generally poor theoretical understanding of the dark side of OSN use (Fox & Moreland, 2015). Accordingly, developing and introducing a taxonomy of the dark side of OSNs which can generate new insights such as advancing the theoretical understanding of the dark side of OSNs is important for IS research. OSNs are networked communication platforms in which users can create profiles and content, establish connections, develop audio and video interactions with their connections, and exchange user-generated content (Berger et al., 2014; Ellison & Boyd, 2013; Erfani et al., 2016). Some scholars argue that using OSNs can have both positive and negative socio-psychological effects, and that these effects need to be well understood by scholars,

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practitioners and users (Mäntymäki & Islam, 2016). Exploring the negative effects and understanding the dark side of using OSNs is important, because over 3.6 billion people are OSN users (Statista, 2019), and their wellbeing can be threatened by the negative effects of OSN use (Mäntymäki & Islam, 2016). Most of the extant literature focuses on the positive aspects (Erfani et al., 2016; Poblet et al., 2018) while little research attention has been paid to the negative effects of using OSNs (Berger et al., 2014; Cao et al., 2015). The few researchers who have examined the dark side of using OSNs report negative effects on individuals such as inappropriate, annoying or obscene content, overload of social responsibility, social pressure (Fox & Moreland, 2015), stress (D'Arcy et al., 2014; Fox & Moreland, 2015), jealousy (Fox & Moreland, 2015; Sánchez et al., 2015), depression and panic (Yan et al., 2016), breach of privacy (Liu et al., 2016; Shiue et al., 2010), addictions, and reduced quality of life (D'Arcy et al., 2014). Nevertheless, they do not offer a comprehensive view of the dark side of OSNs and the existing set of negative effects of OSNs on users is incomplete. Hence, the main purpose of this study is to provide a comprehensive framework for the dark side of OSN use.

The research presented here aims to determine what is already known about the negative effects of OSN use on individuals, by systematically exploring and synthesizing the research evidence on the negative effects of using OSNs from the user perspective, categorizing the effects into distinct groups, and developing and validating a taxonomy to represent and conceptualize the dark side of OSN use. This is then used to propose an agenda for future studies on the dark side of OSNs. The proposed taxonomy of negative effects of using OSNs aggregates the negative effects of using OSNs in the existing literature, giving a structured view of the dark side of using OSNs.

RESEARCH BACKGROUND

Fox and Moreland (2015) describe the dark side of OSNs as narratives surrounding individuals' negative psychological and social experiences tied to OSN use. In other studies, the dark side of OSNs has been used to refer to negative effects such as plagiarism, misrepresentation, time pressure, addiction, and psychological harm (Garcia & Sikström, 2014). Other studies in the literature have characterized negative phenomena such as technology overload (Delpechitre et al., 2019), technostress (Brooks et al., 2017; Tarafdar et al., 2011), interruptions (Addas & Pinsonneault, 2015) and low performance (X. Cao et al., 2018; Lu et al., 2015) as the dark side of OSNs.

Turel and Qahri-Saremi (2016) show that using OSNs causes problematic behavior, and the likelihood of its occurrence increases with the increasing number of OSN users. Problematic behaviors are described as inappropriate, prohibited or dangerous behaviors, which are in conflict with general discipline, rules and regulations and even with individuals' goals (Turel & Qahri-Saremi, 2016). According to Basacik et al. (2011), 14% of surveyed United Kingdom motorists confessed to using at least one OSN application while driving, which reduces attention to the road and response times to road incidents by up to 38% (Basacik et al., 2011).

Use of OSNs is almost ubiquitous among young adults in many countries; for example, in the United States, around 90% of college students are social media users (Pew Research Center, 2018). Recent research revealed that American college students spend around a fifth of their time in class using social media for non-educational purposes (McCoy, 2016). On the other side, other research shows an inverse relationship between students' academic performances and the time they spend on OSNs (Paul et al., 2012; Turel & Qahri-Saremi, 2016).

In addition, recent studies have shown OSN use can play a negative role in current and former social and sexual relationships. Widiantari et al. (2019) found that the marital privacy/status information disclosure on Facebook, and online infidelity, both affect divorce rates in Indonesia. Their finding argues the disclosure of marital privacy/status on Facebook encourages online infidelity that eventually becomes the cause of divorce.

Each of the abovementioned negative effect of using OSNs is only a part of the dark side of OSN use because the dark side is a comprehensive concept that includes individuals' negative psychological

Table 1. Studies on the dark side of IT, social media or OSN use

Reference	Findings
Tarafdar et al. (2011)	This study sought and found i) why technostress (stress caused by the use of technology) is created, ii) how it varies across IT users, iii) what its negative effects are, and iv) how it can be reduced by organizations.
D'Arcy et al. (2014)	This study aimed to advance knowledge on the dark side of IT use in organizations. It introduced new points of view on the negative impacts of IT use namely, interruptions, stress, work overload, misuse of information, and addiction, which are negative effects of IT use that can characterize the dark side of IT use.
Garcia and Sikström (2014)	This study aimed to find the dark side of Facebook to understand how Facebook provides the potential for its users to have a positive or negative impact on their target community. This study found that Facebook users with negative personality traits will be able to broadcast emotional coldness, duplicity, and aggressiveness.
Shelton and Skalski (2014)	This study investigated the prevalence of controversial content on Facebook and the negative impacts of such content. This study stated that cyberstalkers use OSNs to find information on potential victims and controversial or inappropriate content threatens users' privacy.
Fox and Moreland (2015)	This study explored the breadth and depth of users' negative emotional experiences with OSN use. It revealed that OSN use can trigger many minor and major negative emotional experiences. Five themes on the dark side of Facebook were identified: inappropriate or annoying content, being tethered to Facebook, lack of privacy, social comparison and jealousy, and relationship tension.
Silic and Back (2016)	This study investigated OSNs' negative effects on information security, which were not adequately addressed. It found OSNs have become important security holes that cause social engineering, phishing, and malicious attacks. It introduced the three negative effects as a security threat in terms of the dark side of OSN use.
Polites et al. (2018)	This study investigated the dark side of OSN use in terms of lack of self-regulation of time spent using OSNs. The authors offered an identity-based concept called IT identity and investigated the role of this type of identity on the potential negative consequences of OSN use. They identified that a strong IT identity can cause a lack of self-regulation as a negative effect of OSN use.

and social experiences tied to OSN use (Fox & Moreland, 2015). While interest in studying the dark side of OSNs is increasing, recent research stresses that much more needs to be done to understand the phenomenon systematically (Fox & Moreland, 2015) and a comprehensive view of the dark side of using OSNs is lacking (Turel et al., 2018). To confirm the above statements, studies which claimed to investigate the dark side of IT, social media or OSN use were reviewed during initial literature review. However, every one of these studies only revealed part of the dark side rather than a comprehensive overview of this phenomenon. Table 1 reports the findings of a number of these studies.

Based on Table 1, the cited studies that investigated the dark side of OSN use have dealt with only a small part of this phenomenon. Therefore, to fill this gap, this study proposes a preliminary taxonomy of the dark side of using OSNs by conducting a systematic review, to advance understanding of the concept. The conducted systematic literature review is described in the following section.

A SYSTEMATIC REVIEW

This study systematically reviewed the extant literature to collect, analyze and organize the reported negative effects of using OSNs. We adopted the review procedure proposed by Bandara et al. (2011) and Wolfswinkel et al. (2013), which has roots in grounded theory and includes five stages: 'define', 'search', 'select', 'analyze' and 'present'. It enables researchers to conduct a rigorous theory-based conceptualization and analysis of literature, and guides application of thematic content analysis to

Table 2. Search criteria

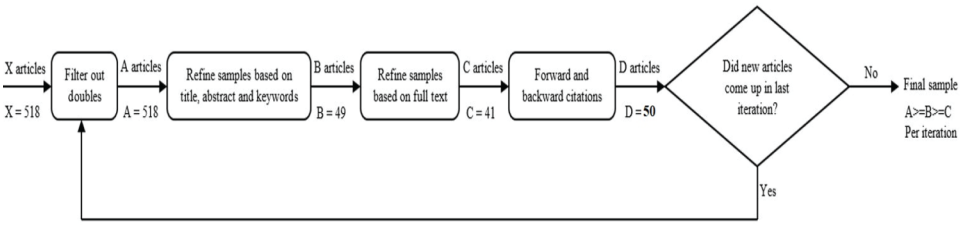
Time frame	2003–2018
Search terms	(negative impact OR negative effect OR dark side OR risk OR adverse consequence OR challenge OR disadvantage) AND (online social community OR online social network OR social networking sites)
Search fields	Title, Keywords, Abstract
Sources	Scopus, Web of Science, PsycInfo and HMIC

identify key themes in a field of study (Wolfswinkel et al., 2013). We used the procedure to construct a taxonomy of the dark side of OSNs, then interviewed 12 experts in the field to validate and make sense of our proposed taxonomy.

Source Selection

In June 2018, the authors executed a keyword search for the period 2003 to 2018 in major databases (Scopus, Web of Science, PsycInfo and HMIC) to capture published research on the dark side of OSNs. According to some studies, the development of OSNs into a global phenomenon started in 2003 (Berger et al., 2014; Heidemann et al., 2012). Also, given the impact of OSN use is both positive and negative, this phenomenon represents an interesting area for IS researchers that has been growing since 2004 and academic papers have called for more research in this area (Berger et al., 2014; Cao et al., 2015). Therefore, the search period started from 2003 as major OSNs were launched after this date. In addition, we looked at controlled vocabularies (subject heading/thesaurus) in four major and relevant databases (e.g., Scopus, and Web of Science) for a more complete and accurate search.

Figure 1. Select stage in reviewing the literature (informed by Wolfswinkel et al. (2013))



Search and Selection

Studies were eligible for inclusion in the review if they met three criteria: i) their title, keywords or abstract contained any combination of terms related to the dark side of OSN use in each of two sets, including at least one term from each set (see Table 2), ii) they were published between 2003 and 2018 inclusive, and iii) they were published in the IS discipline.

The 'search' stage produced around 500 studies. The 'Select' stage thoroughly examined studies' titles, abstract, keywords, and then full text, as illustrated in Figure 1. Studies that did not explicitly report the negative effects of using OSNs were excluded. As Table 3 shows, this led to the selection of 50 studies for final examination.

Figure 2 demonstrates the distribution of the 50 selected studies by year of publication.

Table 3. The 50 selected studies

Reference	Title	Journal
Shiue et al. (2010)	Exploring and mitigating social loafing in online communities	CHB
Lapidot-Lefler and Barak. (2012)	Effects of anonymity, invisibility, and lack of eye-contact on toxic online disinhibition	
Paul et al. (2012)	Effect of online social networking on student academic performance	
Lim et al. (2013)	Managing peer relationships online – investigating the use of Facebook by juvenile delinquents and youths-at-risk	
Oldmeadow et al. (2013)	Attachment style, social skills, and Facebook use amongst adults	
Staksrud et al. (2013)	Does the use of social networking sites increase children's risk of harm?	
Dredge et al. (2014a)	Cyberbullying in social networking sites: an adolescent victim's perspective	
Dredge et al. (2014b)	Presentation on Facebook and risk of cyberbullying victimization	
Sagioglou and Greitemeyer (2014)	Facebook's emotional consequences: why Facebook causes a decrease in mood and why people still use it	
Chan and Saqib (2015)	Online social networking increases financial risk-taking	
Fox and Moreland (2015)	The dark side of social networking sites: an exploration of the relational and psychological stressors associated with Facebook use and affordances	
Sánchez et al. (2015)	''Cyberdating Q_A'': an instrument to assess the quality of adolescent dating relationships in social networks	
Wendorf and Yang (2015)	Benefits of a negative post: effects of computer-mediated venting on relationship maintenance	
Meier et al. (2016)	"Facebocrastination"? Predictors of using Facebook for procrastination and its effects on students' well-being	
Silic and Back (2016)	The dark side of social networking sites: understanding phishing risks	
Van Schaik et al. (2018)	Security and privacy in online social networking: risk perceptions and precautionary behaviour	
Zheng and Lee (2016)	Excessive use of mobile social networking sites: negative consequences on individuals	
Rawassizadeh (2012)	Towards sharing life-log information with society	B&IT
Müller et al. (2014)	Prevalence of internet addiction in the general population: results from a German population-based survey	
Ioannou et al. (2018)	From risk factors to detection and intervention: a practical proposal for future work on cyberbullying	
Han and Myers (2018)	Perceptions of overuse, underuse, and change of use of a social media site: definition, measurement instrument, and their managerial impacts	
Turel and Serenko (2012)	The benefits and dangers of enjoyment with social networking websites	EJIS
Turel (2016)	Untangling the complex role of guilt in rational decisions to discontinue the use of a hedonic information system	
Algarni et al. (2017)	An empirical study on the susceptibility to social engineering in social networking sites: the case of Facebook	
Moody et al. (2017)	Which phish get caught? An exploratory study of individuals susceptibility to phishing	
Lu et al. (2015)	Corporate blogging and job performance: effects of work-related and nonwork-related participation	JMIS
Matook et al. (2015)	Are you feeling lonely? The impact of relationship characteristics and online social network features on loneliness	
Turel and Qahri-Saremi (2016)	Problematic use of social networking sites: antecedents and consequence from a dual-system theory perspective	
James et al. (2017)	The effect of belongingness on obsessive-compulsive disorder in the use of online social networks	
Li et al. (2015)	Privacy leakage analysis in online social networks	C&S
Edwards et al. (2017)	Panning for gold: automatically analysing online social engineering attack surfaces	
Murnion et al. (2018)	Machine learning and semantic analysis of in-game chat for cyberbullying	

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Table 3. Continued

Reference	Title	Journal
Drake et al. (2016)	Job applicants' information privacy protection responses: using social media for candidate screening	AISTHCI
Brooks et al. (2017)	Induced technostress and its impact on internet addiction: a distraction-conflict theory perspective	
Preece (2004)	Etiquette online: from nice to necessary	CACM
Tsikerdekis and Zeadally (2014)	Online deception in social media	
D'Arcy et al. (2014)	Reflecting on the "dark side" of information technology use	CAIS
Alashoor et al. (2017)	Familiarity with big data, privacy concerns, and self-disclosure accuracy in social networking websites: An APCO model	
Yan et al. (2016)	Knowledge sharing in online health communities: a social exchange theory perspective	I&M
Z. Liu et al. (2016)	Self-disclosure in Chinese micro-blogging: a social exchange theory perspective	
Ashuri and Halperin (2017)	"Losers" and "winners": Framing of online self-disclosure in online news media	The Info. Society
Pieters (2017)	Beyond individual-centric privacy: Information technology in social systems	
Jiang et al. (2013)	Research note privacy concerns and privacy-protective behavior in synchronous online social interactions	ISR
Osatuyi (2015)	Personality traits and information privacy concern on social media platforms	JCIS
Wang et al. (2015)	A theory of social media dependence: evidence from microblog users	DSS
Chaudhary et al., 2016)	Cross-site scripting (XSS) worms in Online Social Network (OSN): Taxonomy and defensive mechanisms	IEEE (INDIACom)
Richey et al. (2016)	Exploring situationally inappropriate social media posts: an impression management perspective	IT&P
Sin (2016)	Social media and problematic everyday life information-seeking outcomes: differences across use frequency, gender, and problem-solving styles	ASIS&T
D'Arcy et al. (2018)	Employee moral disengagement in response to stressful information security requirements: a methodological replication of a coping-based model	AISTRR
Zhang and Gupta (2018)	Social media security and trustworthiness: Overview and new direction	FGCS

AISTHCI=*AIS Transactions on Human Computer Interaction*, AISTRR=*AIS Transactions on Replication Research*, ASIS&T=*Journal of the Association for Information Science and Technology*, B&IT=*Behavior and Information Technology*, CACM=*Communications of the Association for Computing Machinery*, CAIS=*Communications of the Association for Information Systems*, CHB=*Computer in Human Behavior*, C&S=*Computers and Security*, DSS=*Decision Support Systems*, EJIS=*European Journal of Information Systems*, FGCS= *Future Generation Computer Systems*, I&M=*Information and Management*, INDIACom=*International Conference on Computing for Sustainable Global Development*, JCIS=*Journal of Computer Information Systems*, JMIS=*Journal of Management Information Systems*, ISR=*Information Systems Research*, IT&P=*Information Technology and People*, The Info. Society=*The Information Society*

Figure 2. Distribution of the 50 selected studies by year of publication

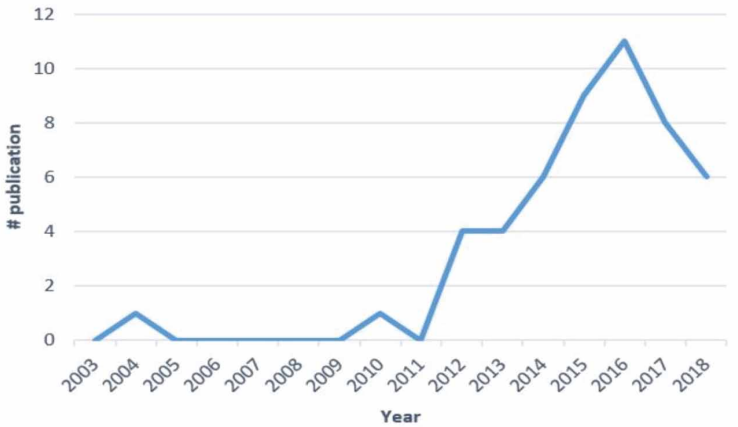
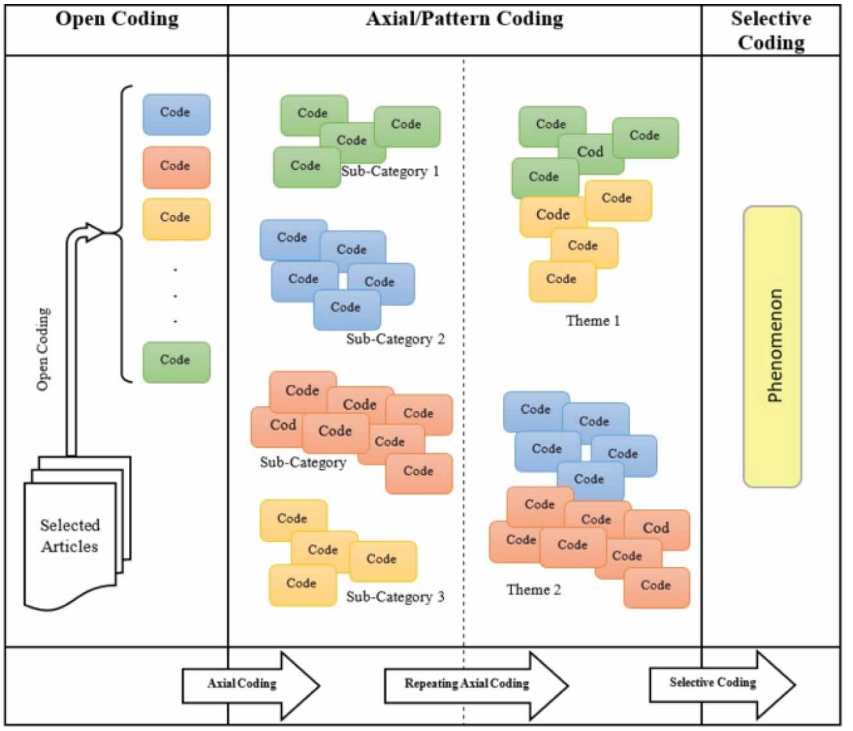


Figure 3. The coding process



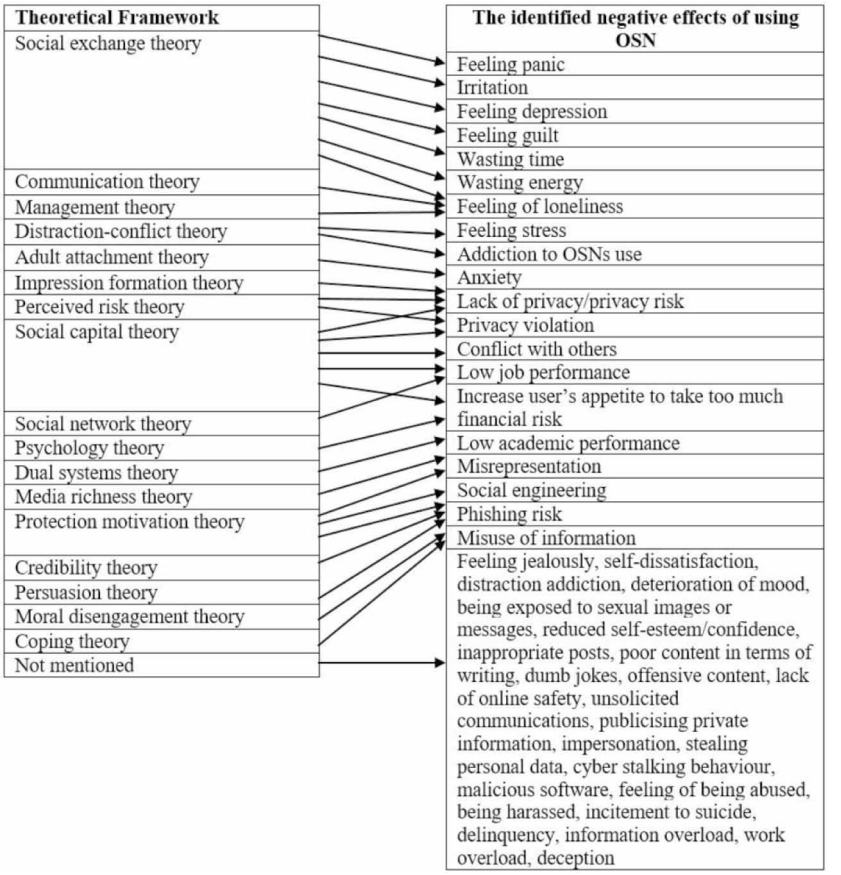
Coding Process

As Figure 3 depicts, Schubert and Williams (2012) and Wolfswinkel et al. (2013) recommend three steps for the 'coding' stage: i) open coding/descriptive coding, ii) pattern coding/axial coding, and iii) selective coding. These steps were used to extract the negative effects from previous studies and consolidate them based on similarity. To be consistent with the literature and also to make the findings comparable to those of previous research, naming of the newly formed themes was guided by the studies cited in Table 4.

More detail about the coding process is given below:

- **Open/Descriptive Coding:** It is an analytical process that helps researchers capture concepts or variables from the selected articles. Open/descriptive coding is used to elicit basic concepts from the content of each selected reference (Schubert & Williams, 2012; Wolfswinkel et al., 2013). This step was used to identify 46 negative effects of using OSNs mentioned in the 50 selected articles (Table 4).
- **Pattern/Axial Coding:** This step enables researchers to group codes into relevant subcategories based on the similarity of their attributed values or properties (Schubert & Williams, 2012; Wolfswinkel et al., 2013). This qualitative research technique is a repeatable process that involves relating codes together to reveal subcategories and categories or themes (Schubert & Williams, 2012; Wolfswinkel et al., 2013). This study used pattern coding to group the 46 identified negative effects into eight subcategories (i.e. the second column of Table 4): intrinsic cost, opportunity cost, inappropriate content, obscene content, privacy concerns, security threats, cyberbullying and low performance. In addition, the second round of pattern/axial coding of the eight subcategories resulted in six themes (i.e. the third column of Table 4) representing the

Figure 4. Theoretical support for the identified negative effects of using OSNs



dark side of using OSNs: cost of social exchange, annoying content, privacy concerns, security threats, cyberbullying and low performance. The discussion section describes the proposed themes of the dark side of using OSNs.

- **Selective Coding:** It helps researchers to attach the discovered themes to a phenomenon (Schubert & Williams, 2012; Wolfswinkel et al., 2013). Selective coding is the stage in data analysis where a core concept is identified, and then abstracted. The authors of this study already knew that this phenomenon is the dark side of OSN use and they needed to identify its content. The combined result of the sequential coding process (i.e. open/descriptive and pattern/axial coding) was the set of key themes shown in Table 4. Consequently, this step led the authors to conceptualize the dark side of using OSNs as a phenomenon and attached the six themes to it.

THEORETICAL BACKGROUND FOR TAXONOMY OF THE DARK SIDE OF OSNS

Of the 50 selected studies, 17 adopted one or more theories to elaborate the negative effects of using OSNs. The two most common theories were social capital theory (Chan & Saqib, 2015; Lu et al., 2015; Shiue et al., 2010) and social exchange theory (Z. Liu et al., 2016; Matook et al., 2015; Yan et al., 2016). Figure 4 shows all the theories used in the reviewed studies.

The theoretical mapping in Figure 4 demonstrates the categories of theories that have been used to study the negative effects and the dark side of using OSNs, and it unlocks opportunities for future research to examine the negative effects of using OSNs from new perspectives. Study of the negative effects of using information technologies such as OSNs is complex, and new theoretical developments or fresh application of existing theories can help address this complexity. Based on this theoretical map and the reviewed literature, we removed duplicated or overlapping negative effects and consolidated items with similar properties into the same themes to form the proposed taxonomy.

Two independent experts with research expertise in OSNs were then asked to assess the coding outcomes and to comment on the presentation of results. Neither expert was involved in the coding process. Their major comment was to map the theories used in the selected studies with the corresponding negative effects to help in a better sensemaking of the relationship between them and to highlight theoretical support for the effects. This resulted in the initial taxonomy of the dark side of OSNs shown in Table 4.

EXPERT INTERVIEWS FOR CONTENT VALIDITY

We conducted structured interviews with experts to determine the content validity of the findings of the systematic review and to ensure the proposed taxonomy made sense. Lynn (1986)'s guideline was used to conduct expert interviews to assess content validity. Our participants were multidisciplinary experts with published articles in the OSN literature. In mid-June 2018, invitations were sent to 50 experts who worked in an Australian university or who authored a study cited in this research, and 12 including 5 females and 7 males (24%) agreed to participate in an interview. Lynn (1986) recommends 10 or more participants.

This research assessed the content validity of the proposed taxonomy in two steps: step one assessed items or elements (i.e. the 46 extracted negative effects of using OSNs), and step two assessed the instrument (i.e. the proposed categorization of the identified negative effects of using OSNs in Table 4). The outcomes of these steps were the proportions of experts agreeing on the content of a negative effect and the corresponding categorization or instrument. Interviews were conducted by the first author between June and September 2018, face-to-face, at a location most convenient for the participant. Interviews took around one hour on average, and were audio-recorded for later transcription. The initial version of the proposed taxonomy was presented to each expert in the interview session and experts were asked i) whether the allocation of each negative effect to its corresponding subcategory or theme made sense, ii) if not, what changes were needed and why, and iii) if they had other comments on the proposed taxonomy.

The experts' input was carefully reviewed and the number of agreements for all allocations of items was processed based on Lynn's (1986) guideline. For a population of 12 participants, Lynn (1986) recommends a minimum of nine endorsements (75% or higher) for each item. As described below, the experts overwhelmingly endorsed the initial item allocations, but recommended changes in allocations for some items:

- **Items with at least 92% endorsement:** Experts gave 100% endorsement for 28 of the 46 negative effects: irritation, stress, guilt, jealousy, loneliness, low mood, anxiety, reduced self-esteem/confidence, addiction to an OSN, wasting time, wasting energy, wasting money, inappropriate posts, poor content in terms of writing, lack of privacy, privacy violation, lack of online safety, unsolicited communications, impersonation, malicious software, phishing risks, being harassed, incitement to suicide, delinquency, low academic performance, and low job performance. A 92% endorsement rate was achieved for eight negative effects: self-dissatisfaction, feeling depression, panic, dumb jokes, publicizing private information, deception, misuse of information, and conflict with others. Most experts agreed with the allocations of these items to themes, but some made

recommendations such as moving 'self-dissatisfaction' from 'cyberbullying' to the 'intrinsic cost' category.

- **Items with 75–91% endorsement:** Six of the 46 negative effects (information overload, increased appetite for financial risk, offensive content, misrepresentation, stealing personal data, cyberstalking behavior) were endorsed by 83% (10 of 12) of the interviewed experts. An example of feedback was to move 'cyberstalking behavior' from the 'security threats' category to 'privacy concerns'. An endorsement of 75% was achieved for three negative effects (work overload, distraction addiction and feeling of being abused), and experts' comments were considered in revising allocations to the corresponding categories. Almost all experts agreed that 'being exposed to sexual images or messages' needed to be moved from the 'obscene content' to the 'intrinsic cost' subcategory.
- **Items with less than 75% endorsement:** The interviews sought experts' opinions on whether the proposed categories and themes made sense. Except for two subcategories (intrinsic cost and opportunity cost), the experts overwhelmingly endorsed the proposed taxonomy. Feedback for intrinsic cost and opportunity cost subcategories highlighted the importance of clarifying whether 'cost' represents financial and/or non-financial costs. Thus, intrinsic cost and opportunity cost subcategories were grouped into one theme, 'cost of social exchange', to stress the social costs of engaging in OSNs. Based on experts' recommendations, the names of these subcategories were revised to 'intrinsic cost/cognitive cost' and 'opportunity cost/executional cost'. In addition, feedback was collected about names of pattern/axial codes, and clarifications were made accordingly.

Table 4 represents the proposed taxonomy of the dark side of using OSNs. Although a few reviewed studies (e.g. D'Arcy et al. (2014), Fox and Moreland (2015), and Silic and Back (2016)) focused on the dark side of using OSNs or IT, none provided a common or holistic description of this phenomenon. Based on the interviewed experts' opinions, Table 4 contains the first taxonomy of the dark side of using OSNs with six themes: 'cost of social exchange', 'annoying content', 'privacy concerns', 'security threats', 'cyberbullying' and 'low performance'.

DISCUSSION

Recent studies by professional and industry bodies have produced alarming evidence about the negative effects of using IT and OSNs. For instance, 83 percent of the United State (US) consumers rate privacy concerns about their personal data as a top issue in IT use (Feretic, 2014). According to the Cyberbullying Research Center, 33.8% of surveyed Australian teenagers reported being cyberbullied (Karlis, 2019), and Oxford University research found that cyberbullying doubled the risk of self-harm or suicidal behavior in young generation (Knapton, 2018). Common Sense Media reported that 50% of the US teens stated that they "feel addicted" to their mobile devices as a result of using OSNs such as Facebook and Twitter (Cohen, 2016). One study showed that iPhone users unlock their phones an average of 80 times per day, and Android users 110 times per day (Hussung, 2017). Each of these studies identified part of the dark side of OSN use. However, there is no overview of the dark side concept to provide a deeper understanding of this problem as a basis for IS research. This study addresses this issue by developing a taxonomy for the elements of the dark side of using OSNs, showing how this concept can be operationalized. The taxonomy comprises six themes of the dark side of using OSNs:

- **Cost of Social Exchange:** This theme was informed by social exchange theory (SET). Costs in social exchanges are negative consequences from exchange behavior that reduces behavior frequency (Tong et al., 2007; Yan et al., 2016). According to SET, costs in the OSNs content

Table 4. Taxonomy of OSN users' negative experiences and themes of the dark side of using OSNs

Open/Descriptive and Structural Coding	Pattern Coding	Axial Coding	Selective Coding
Feeling panic	Intrinsic cost/Cognitive cost (Tong et al., 2007; Yan et al., 2016)	Cost of social exchange (Tong et al., 2007; Yan et al., 2016)	Dark side of using OSNs
Irritation			
Feeling stress			
Feeling depression			
Feeling guilt			
Feeling jealousy			
Feeling of loneliness			
Flaming behaviors			
Anxiety			
Self-dissatisfaction			
Distraction addiction			
Deterioration of mood			
Reduced self-esteem/confidence			
Addiction to the use of OSNs			
Information overload			
Wasting time	Opportunity cost/Executional cost (Tong et al., 2007; Yan et al., 2016)		
Wasting energy			
Wasting money			
Work overload			
Increase user's appetite to take too much financial risk			
Inappropriate posts	Inappropriate content (Fox & Moreland, 2015; Han & Myers, 2018; Preece, 2004)	Annoying content (Preece, 2004)	
Poor content in terms of writing			
Dumb jokes	Obscene content (Preece, 2004)		
Being exposed to sexual images or messages			
Offensive content			
Lack of privacy	Privacy concerns (D'Arcy et al., 2014; Fox & Moreland, 2015; Jiang et al., 2013; Osatuyi, 2015; Rawassizadeh, 2012)	Privacy concerns (D'Arcy et al., 2014; Fox & Moreland, 2015; Jiang et al., 2013; Osatuyi, 2015; Rawassizadeh, 2012)	
Privacy violation			
Lack of online safety			
Unsolicited communications			
Publicizing private information			
Misrepresentation			
Deception	Security threats (D'Arcy et al., 2014; Chaudhary et al., 2016; Z. Liu et al., 2016; Zhang & Gupta, 2018)	Security threats (D'Arcy et al., 2014; Z. Liu et al., 2016; Zhang & Gupta, 2018)	
Misuse of information			
Impersonation			
Stealing personal data			
Cyberstalking behavior			
Malicious software			
Social engineering			
Phishing risks			
Feeling of being abused	Cyberbullying (Dredge et al., 2014a; Ioannou et al., 2018; Lim et al., 2013)	Cyberbullying (Dredge et al., 2014a; Ioannou et al., 2018; Lim et al., 2013)	
Being harassed			
Conflict with others			
Incitement to suicide			
Delinquency			
Low academic performance	Low performance (Fox & Moreland, 2015; Lu et al., 2015; Turel & Qahri-Saremi, 2016)	Low performance (Fox & Moreland, 2015; Lu et al., 2015; Turel & Qahri-Saremi, 2016)	
Low job performance			

refer to negative situations such as psychological problems and negative consequences of a wrong decision, such as time, money and energy (Yan et al., 2016). Consequently, this dimension of the dark side represents two types of costs of using OSNs: cognitive costs/psychological problems (e.g. stress, anxiety, depression and jealousy) and executional costs (e.g. wasting time, money and energy) (Tong et al., 2007; Yan et al., 2016).

- **Annoying Content:** This theme refers to a wide range of content that annoys, upsets or irritates users (Fox & Moreland, 2015), such as sexual or illegal text, comments, photos and videos (Han & Myers, 2018; Shelton & Skalski, 2014). It can also include text messages that do not consider the rules of writing, and have spelling or grammatical mistakes, poor punctuation and dumb jokes (Preece, 2004). Therefore, this theme includes any inappropriate posts (Butler, 2010; Fox & Moreland, 2015; Shelton & Skalski, 2014) and obscene content (Fox & Moreland, 2015; Preece, 2004).
- **Privacy Concerns:** This dimension of the dark side was informed by perceived risk theory. Perceived risk theory believes that as long as the outcome of any action or behavior is uncertain, there is risk of lack of privacy or privacy violation (Fraedrich & Ferrell, 1992). Users' privacy violations come from the context of personalization of web services that causes privacy concerns (Gal-Or et al., 2018; Pieters, 2017). Thus, this theme describes anything that threatens personal privacy related to storing, re-purposing, providing to third parties, and displaying information via OSNs (Gal-Or et al., 2018; Pieters, 2017; Rawassizadeh, 2012).
- **Security Threats:** Grounded in the reviewed literature (Chaudhary et al., 2016; Gupta et al., 2019; Zhang & Gupta, 2018), any harm situation suffered from interception, information fraud, privacy spying and copyright infringement is labeled a security threat. This theme refers to anything that has the potential to cause serious harm (e.g., deception, phishing and social engineering) to OSN users (Chaudhary et al., 2016; Z. Liu et al., 2016; Gupta et al., 2019; Zhang & Gupta, 2018). Therefore, security threats refer to incidents that erode the confidentiality, integrity and availability of information and information systems (Roman et al., 2018).
- **Cyberbullying:** From the lens of neutralization theory, which originally developed to trace the roots of criminal behaviors, cyberbullying is a criminal behavior (Zhang & Leidner, 2018). Cyberbullying can be defined as aggressive and intentional acts (e.g., abuse, harassment and delinquency) carried out by an individual or a group of attackers (D'Arcy et al., 2014; Ioannou et al., 2018). Attackers attempt to harm and disempower their victims using electronic communication (Dredge et al., 2014a; Ioannou et al., 2018).
- **Low Performance:** Dual systems theory believes that problematic behaviors such as low performance can be driven by an imbalance between two different types of emotional-cognitive systems such as personal norms and habits in the human brain (Turel & Qahri-Saremi, 2016). Accordingly, low performance refers to poor or incomplete performance when a person fails to attend to their responsibilities and complete them according to a set of standards (Fox & Moreland, 2015). This theme occurs when OSN use directly or indirectly results in users' low academic or job performance (Fox & Moreland, 2015; Paul et al., 2012; Turel & Qahri-Saremi, 2016).

The proposed taxonomy in Table 4 incorporates negative effects that correspond to each of the six themes, while Figure 4 maps their relationship to the theories used in the reviewed studies. The taxonomy advances the theoretical understanding of the dark side of OSNs as it organizes concepts about the dark side of OSN use and allows scholars to speculate on the relationship between them. It stimulates and guides future studies in developing new theories or taking a fresh look at existing theories to enhance theoretical understanding of the negative effects of OSNs on users, as well as strategies for minimizing harm created by those negative effects on users' wellbeing and performance. It can guide future researchers to scrutinize the interrelationships and synergies between various negative effects of technology use in the OSN context. Based on previous literature, this research investigated what the dark side of OSNs entails and refers to types of negative effects such as

risks, controversies and adverse consequences of using OSNs (Silic & Back, 2016). This study consolidates the previous diverse work in this field to produce a sensible and integrated framework for operationalizing the dark side of using OSNs. The findings also have implications for research and practice, as outlined below:

- **Increasing Users' Awareness:** This study's findings will help educate users and increase their awareness about the possible negative effects of using OSNs. Users may not anticipate or underestimate the magnitude of such risks, making them more vulnerable (Fox & Moreland, 2015). Also, prevalence of users' negative experiences has a positive relationship with users' lack of knowledge on the negative effects of using OSNs and how those effects might occur. The proposed taxonomy can be used to show users the specific negative feelings or inappropriate circumstances they may experience when interacting with peers on OSNs. Greater awareness can encourage moderation of highly vulnerable people's use of OSNs; for instance, more aware parents can prevent or mitigate mental and physical health problems that may threaten their children if they become addicted to a particular platform (Kagi, 2018).
- **Increasing Policymakers' Awareness:** Advanced theoretical understanding about the dark side of OSNs generated by the taxonomy developed in this study can inform policymakers to develop policies about OSN use which are essential to reduce the negative effects of OSN use and can enhance the productivity of individuals as well as the platforms (Brady et al., 2015; Rana & Hossain, 2016). Understanding the negative effects of OSN use will help social network educators develop their own policies on social media use in classrooms.
- **Increasing Application Developers' Awareness**: Finally, the proposed taxonomy will inform application developers and consultants about the wide range of potential negative effects of using OSNs. Technical features of OSNs can influence users' digital behavior changes. For example, a recent study raised concerns that the qualities and attractiveness of iPhone features have caused a public health crisis and could harm children's wellbeing in particular (Kawa, 2018). Another study by Elaheebocus et al. (2018) provided a list of technical features that can affect users' behavior on OSNs. However, these two studies emphasized that their proposed list of features should be used alongside a set of potential negative effects of OSN use so that application providers can consider mitigation strategies.

RECOMMENDATIONS FOR FUTURE STUDIES

This taxonomy facilitates the search and discovery of the negative effects of using OSNs identified by diverse studies. It demonstrates improved discovery of the elements of the dark side of OSNs, and clarifies the concept of the dark side in detail by categorizing relevant negative effects. This finding not only provides an overview of the dark side of OSN use but also provides a path for researchers to i) further extend social, behavioral and information science theories to explore and explain the negative effects of using OSNs, ii) investigate the underlying drivers of the inner layers of the dark side, iii) develop other layers if applicable, and also iv) develop this taxonomy for other levels of analysis including for societies and organizations.

Using Information Science Theories to Examine the Dark Side of IT Use

Studies on OSN use have applied multidisciplinary theories to highlight the benefits of OSNs. For example, social capital theory (Ellison et al., 2011), social network theory (W. Liu et al., 2017), social support theory (Erfani et al., 2016; Maier et al., 2015), persuasion theory (Westerman et al., 2014), social cognitive theory (DeAndrea et al., 2012) and communication theory (Youmans & York, 2012) have been used extensively to explore the positive potential of OSNs. However, our review revealed far less research on these theories and the negative effects of OSNs. The proposed taxonomy paves

the way for future studies to further extend social, behavioral and information science theories to explore and explain the negative effects of using OSNs.

EXAMINING THE DARK SIDE OF MULTIPLE OSN PLATFORMS AND USER COHORTS

Of the 50 studies reviewed, 41% concentrated on Facebook, 31% considered other OSNs, and 28% did not refer to any specific platform. Hence, many widely used OSN platforms, such as YouTube, Instagram, WhatsApp, Twitter and country-specific applications, have received little research attention relative to Facebook. More research is needed to understand the negative effects of OSN platforms other than Facebook. Future researchers could compare the negative experiences of using OSNs across multiple platforms, and determine whether and how the characteristics of a platform play a role. In addition, most of the reviewed studies considered adult students or employees. Other groups of OSN users, such as older people, young children and people in need of care, are less well represented in the literature. The literature shows that different users experience different positive or negative impacts from OSN use, thus research needs to examine what the proposed taxonomy of the dark side of using OSNs means for diverse cohorts of users. All reviewed studies were about people between 13 and 69 years of age; while other users who are younger than 13 and older than 69 are also typically more vulnerable to online harm due to their lower computer and digital literacy.

Examining the Dark Side of Using OSNs in Developing Countries

About 70% of studies included in the literature review were conducted on OSN users living in highly developed countries. However, two thirds of internet users live in less developed countries (InternetWorldStats, 2018), and therefore research on OSN use in such countries should be encouraged. Users who have not been sufficiently trained in online transactions are highly vulnerable to online harm (Betts & Spenser, 2017). This is especially important in less developed countries, where institutions may not be able to provide the protections offered in more developed countries.

Exploring the Underlying Causes of the Dark Side of Using OSNs

While all the reviewed studies explored at least one negative effects of using OSNs, none of them addressed the underlying causes. Future researchers should determine how OSN use leads to negative outcomes for users. One important factor in understanding underlying causes, which was overlooked in the reviewed studies, is gender. Few studies compared the negative effects of using OSNs for males, females and other genders especially for sexual content and abuse/violence. D'Arcy et al. (2014) found that the dark side of IT is a complex domain, because various negative effects of IT use may be interrelated and may reinforce or weaken each other's effects. Therefore, studying the relationship between the negative effects of using OSNs can help researchers identify the main causes of the negative effects.

CONCLUSION

The enormous popularity of OSNs highlights the importance of understanding both the positive and negative implications of their use. Many studies have acknowledged the positive effects of these platforms but little attention has been paid to the negative effects – the dark side – of OSN use. Understanding the negative aspects of using OSNs is as important as recognizing the positive aspects. This is because it not only encourages researchers to find complex cause-and-effect relationships but also helps develop mitigation strategies and mechanisms to combat negative effects. Consequently, reducing the negative aspects reinforces the positive aspects of OSN use. This study contributes to the literature by providing a comprehensive representation of the dark side of using OSNs which

includes the negative effects of OSN use. This study systematically synthesized recent literature on the dark side of using OSNs to develop a structured classification of negative effects to stimulate and guide future research in this field. The proposed taxonomy of the dark side of OSNs paves the way for future research and theorization of the negative effects of OSNs for users and the development of mitigation strategies.

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