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**ABSTRACT**

Just like any other information technology products, online social networks (OSNs) also add to users technostress. In this paper, we use the stress-strain-outcome framework to explore how OSN technostress influences OSN users. Our findings suggest that technostress induces OSN burnout which in turn increases users intentions to adopt stricter privacy settings and to discontinue using the OSN altogether

**Keywords**

Technostress, Privacy settings, Discontinuation.

**INTRODUCTION**

The sustainability of Online Social Networks (OSNs), such as FaceBook, WhatsApp, and Twitter, depends on its users' active involvement and the level of their information disclosure on these networks. To the surprise of many researchers from both the academia and practice, OSN users have been very generous in this regard. Reports such as 'over 40 hrs of video are uploaded on YouTube every hour', 'Facebook tops 1 billion users' (Grandoni, 2012), 'more than 1 billion pieces of content are shared' on Facebook on weekly basis (Krasnova 2009) simply highlight the point. In addition to users' direct sharing of information, the OSNs artificially enhance the information sharing through their various technical features. For example, the Newsfeed function on FaceBook dynamically delivers hands-on information on the actions of friends. When a user logs into his or her FaceBook account after a week, it provides a summary of posts; if the user visits every hour, it provides the most recent stories. Another such feature is stream communication, which allows even more users to get involved through commenting.

Though the involvement as well as sharing of information on OSNs is voluntary and is generally for hedonic purposes (Sledgianowski and Kulviwat, 2009), recent studies have reported increased levels of user stress with OSN use (Gartner 2011; Koroleva et al 2010). As OSNs are products of information technology, OSN stress would fit the description of technostress described as one's inability to cope or deal with information technology in a healthy manner (Brod, 1984). The existing works suggest

that the OSN stress occurs due to information overload (Koroleva et al 2010), which arises due to overabundance of information. However, in this work in progress, we propose a more comprehensive description of OSN stress and extend this line of work by including two additional dimensions – social overload and techno-overload. We borrow the concept of social overload from the literature on residential density in urban planning studies, and techno-overload from the works on uncertainty of technological changes in work settings.

We use the stress-strain-outcome framework to theoretically propose and empirically explore the effects of OSN technostress. In particular, we explore how OSN technostress leads OSN users to reduced information sharing and even discontinuation of OSNs use. Understanding the roles of these factors is critical as both reduction in information sharing and usage discontinuation affect the bottom line of OSNs. In addition, this research not only helps in understanding the dark side of OSNs, that is OSN technostress, but also extends the works on users' information sharing behavior, which is also associated with users' privacy concerns.

The remaining paper is as follows: After providing a brief introduction to the technostress construct, we lay the foundations of our theoretical model and the proposed hypotheses. We then discuss the two-phase methodology to be employed for the complete study, and the present the results of only the first phase of the study. We conclude this paper with the discussion of our findings and proposed future work.

**TECHNOSTRESS**

The term technostress was originally coined by clinical psychologist Craig Brod (1984), who described it as a "modern disease of adaptation caused by an inability to cope with new computer technologies in a healthy manner". Some works refrain from calling it a disease and have described it as negative effects on human attitudes, thoughts, behavior, and psychology resulting from technology (e.g., Weil and Rosen 1997). It should be noted that the technology becomes an antecedent of technostress and is not necessarily the main stressor.

Koeske and Koeske (1993) proposed a stressor-strain-outcome framework to explain how stressors result in

behavioral outcomes. According to the framework, people change their behavior (outcome) in order to reduce the effects of adverse reactions (strain) that result from an imbalance between a person situation and the demands of the environment (stress). In other words, technostress is a "response that individuals experience when they anticipate their inability to respond adequately to the perceived demands of a given situation, accompanied by an anticipation of substantial negative consequences due to inadequate response" (Tarafdar et al 2007).

**THEORY AND HYPOTHESES DEVELOPMENT**

**OSN Stressors and Strain**

Though technostress was originally discussed over three decades ago, interest in it in the IS field spiked after the introduction of PDAs and growth in OSN phenomenon around the years 2005-2006 (Bucher, 2013). Yet, research on OSNs and its impact on the perception of stressors and strains remains very limited. The existing works suggest that OSNs could contribute to stressors as these require high levels of engagement and interaction (Ayyagari, 2011) while rendering communication faster and more transparent (Bucher, 2013).

A thorough literature review in the areas of information technology, psychology, and residential planning revealed three dimensions of stressors that are relevant to OSNs (Eppler and Mengis, 2004; McCarthy and Saegert, 1979; Tarafdar et al., 2010; Ayyagari et al., 2011). Our proposed research model is shown in Figure 1, and the role of three dimensions as shown in the figure is discussed next:

**Stressor: Information Overload**

In simple terms, information overload refers to a situation in which the available information exceeds an individual's capacity to process the information (Eppler and Mengis, 2004). The feeling of overload is usually associated with a loss of control over the situation and with feelings of being overwhelmed. Generally, it has been linked with adverse effects and has been tested in several contexts, such as decision rationality (Grover et al 2006), e-commerce experience (Chen et al., 2009), and interpersonal trust (Beaudoin 2008).

SNSs, by their very nature, provide easy access to more information than what one can normally handle. For instance, Facebook users generate lots of content. Yarow (2013) highlights that "there are on average 1,500 potential stories from friends, people they follow and Pages for them to see" on FaceBook. When a user visits his or her FaceBook page after a break of a week, it provides a summary of posts; if the user visits every hour, it provides the most recent stories. This feature alone can result in a constant stream of new information for the user. Similar statistics have been reported for social media in general. The IACP (2013) Center for Social Media reports that an average social network user receives 285 pieces of content daily, including 54,000 words and 443

minutes of video, that is, equivalent of a novel and about four movies. Ellison et al (2011) report the median number of friends on FaceBook for college users to be 300, the number that sometimes rises into thousands. Simply following updates in feeds could pose a challenge. The overabundance of information makes it more difficult than ever to find what is relevant. As a result, the users get overwhelmed and experience the problem of information overload. Based on the fact that stressors cause strain, we expect information overload to lead to strain in OSN users.

**Stressor: Social Overload**

A number of studies on physical crowding have suggested that individuals end up with increased social contacts and interactions in high density and overcrowded neighborhoods (McCarthy et al, 1979). Such situations lead to adverse effects, such as social withdrawal, on individuals. These studies further suggest that it is not the density per se that results in negative responses, but rather the experience of excessive social encounters and associated expectations that a person can handle. These experiences are termed as 'social overload'.

In the context of OSNs, social overload can be described as the level of virtual interaction which an individual needs to engage in exceeds what the individual can cognitively handle. The overload occurs when the number and variety of social exposures exceeds an individual's interaction capacity, that is, an individual's ability to process the interactions and respond appropriately (McCarthy et al, 1979). While using OSNs, individuals are constantly faced with situations of managing their self-presentation or status updates, replying to or liking others messages, and addressing to the needs of others. These situations conjoined with social norms and bonds make individuals feel responsible to take care of their friends, to address their problems, or to amuse them (Koroleva et al., 2010) results in social overload.

**Stressor: Techno Overload**

In work environment, techno-overload or techno-uncertainty has been defined as the 'uncertainty of technology, such as constant changes in hardware of software'. This is exemplified by either the changes to existing technologies, or the introduction of new technologies. The techno-uncertainty is considered a stressor as rapid technological changes create an exceptionally dynamic work environment where employees must regularly learn how to work with new applications with the possibility that some of their acquired knowledge and skills may become obsolete (Tarafdar et al., 2010; Ayyagari et al., 2011).

In OSNs, techno-overload can occur in several forms. The user interfaces and information display patterns in OSNs change often. As user interface is what facilitates the dialogue between the user and OSN platform, changes to the interface imply the presence of changed or increased

demands on the user. For example, recent drastic user interface changes in Twitter (Ungerleider 2014), FaceBook (Bell 2014), and Google (Schwartz 2010) highlight the changing demands for the users. In some cases, even privacy policies as well as controls have been changed. Although privacy settings provide users some control over their information, such settings are often complicated and unintuitive. Changes in policies further add to the user's burden. As such, Facebook has extensive privacy settings, accessible through a privacy link with sub-pages for major categories of information sharing options. Any changes, to the way these settings work, adds to the user's overload. Lastly, lack of consistency in the interface and user settings across various social networks and devices one uses exacerbates users' frustration, errors, and learning problems.

### Strain: Burnout

Burnout refers to strain resulting from depleted emotional and physical resources and feelings of being overextended (Maslach and Leiter, 2008). Past works have linked burnout with poor performance, absenteeism from work, cynicism, and weak organizational citizenship behavior. To cope up with work burnout, individuals distance oneself emotionally and cognitively from one's work or other work related activities.

In our context, burnout can be seen as a feeling of being emotionally overextended due to OSN usage. Similar to past works, we expect OSN burnout to cause change in behavioral patterns such that the users' adverse feelings are reduced. We propose that, due to burnout, OSN users will attempt to reduce the impact of stressors by either limiting their public profile, i.e., by exercising stricter privacy controls to restrict what gets posted on their account as well as who gets to contact them, or discontinue the use of the OSN altogether. For example, FaceBook users can limit users that can post content on their FaceBook wall or limit who can contact the user. Using stricter privacy settings will reduce the amount of information that a user gets and the amount of social interaction that the user gets involved in.

### Hypotheses

In the background of the above arguments, we propose the following hypotheses:

**H1**: The higher the information overload, the higher the OSN burnout.
**H2**: The higher the social overload, the higher the OSN burnout.
**H3**: The higher the techno overload, the higher the OSN burnout.
**H4**: The higher the burnout, the higher the intention to discontinue the use of OSN.
**H5**: The higher the burnout, the higher the intention to use stricter privacy controls.

As the intentions to use stricter privacy controls will also depend on how strict the users believe their existing privacy control settings to be, we add a control variable to account for their existing privacy settings strictness.

### METHODS

In order to validate our proposed hypotheses, we uses a two-phase survey methodology. The first phase of the study captures users' self-reported perceptual measures of stressors, burnout, and their intentions towards information sharing as well as discontinuance of the OSN. The second phase is planned to be conducted after 6 months of the first phase to provide time lag to capture the users' actual information sharing and discontinuance behavior after recording their level of stressors. The current paper presents and discusses the methodology and results of the pilot testing of the first phase only.

We chose FaceBook as the OSN for this research context as it is the largest OSN with over 1 billion users. Electronic invites to complete the survey were sent to 150 FaceBook student users. Of the 150 invites, a total of 102 usable surveys were collected and used for data analysis.

### Measures

The measures used in this study were based on previously validated measures where possible. Scale items for the information overload and social overload constructs were adopted from Weinert et al (2012) and Laumer et al (2013). The items for techno-overload were developed for this study. Burnout was adapted from Ayyagari et al (2011). Items for Privacy Control Intentions were developed for this study. Lastly, items for discontinuous intentions were adapted. Current settings strictness was measured using a single item, where the users were asked to rate their current privacy settings strictness on 1 to 5 scale. In this study, a total of five constructs, and a total of 24 items (four items for each construct except for 3 items for discontinuance intention, and 1 item for the control variable) with Likert scale ranging from "Strongly disagree" to "Strongly agree" were employed.

### DATA ANALYSIS AND RESULTS

Before applying statistical procedures, data abnormalities such as missing data and outliers were investigated. Violations of statistical assumptions were also checked. Missing data were checked and incomplete instruments were not included in the study. Outliers' tests revealed that there was no need for a corrective treatment. Data were also checked for violations of assumptions such as normality and linearity and results indicated that these assumptions were met in the data collected. Partial least squares (PLS) was used to assess both the research models and the psychometric properties of the scales.

**Measurement Model Assessment**

In this study PLS was used to assess the convergent validity, discriminant validity and the internal consistency (reliability) of the constructs forming the research model. Chin (1998) sets criteria for acceptable psychometric properties. These criteria require that (1) internal consistencies exceed 0.70; (2) loadings in a confirmatory factor analysis (CFA) exceed 0.70; (3) loadings are greater than cross-loadings; and (4) the square root of the average variance extracted (AVE) exceeds the inter-construct correlations (Chin 1998).



Figure 1: Research Model and Results
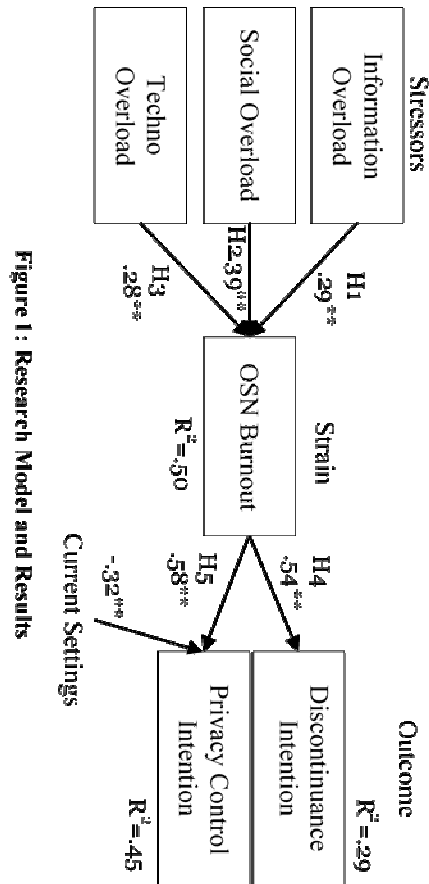
To check if these criteria are met in our model, we first tested whether the items load highly (greater than 0.70) in only one construct and if these loadings are greater than cross-loadings. Two items, one from the techno overload and one from privacy control behavior, were dropped and eliminated from the analysis as the two items violated these guidelines. After checking the loadings of the items, internal consistency was checked with composite reliabilities. All the constructs demonstrated acceptable values: the reliability coefficients of all the constructs ranged from 0.87 to 0.93 and are above 0.70.

Next, we checked for convergent and discriminant validity. Results demonstrated convergent validity as the AVE values of all constructs are over 0.63, which is higher than the threshold of 0.5. Comparing the square

root of the AVE to the correlations among the constructs, each construct was more closely related to its own construct than to the others which simply means that discriminant validity is demonstrated in this study. Thus, results suggest that the scales demonstrate adequate psychometric properties.

**Structural Model Assessment and Hypotheses Testing**

We also used PLS to assess the model and the proposed hypotheses among the five latent constructs. The analysis results are graphically presented in Figure 1. It shows the path coefficients and the significance levels for each hypothesis as well as the variances for the three dependent constructs: OSN burnout, privacy control intentions, and discontinuance intentions. The significance of the paths was determined using the t-statistic calculated with the bootstrapping technique. All constructs were modeled as reflective. Strain (along with the control variable as shown in Figure 1) explains 29% and 45% of the variance in discontinuance intentions and privacy control intention respectively, whereas three overload constructs explain 50% of the variance in burnout. All five hypotheses are significant at 0.01 level.

**DISCUSSION**

Despite its importance, the process of technostress has remained significantly understudied in MIS research. This paper conceptualizes and provides theoretical and empirical shape to the concept of OSN technostress. Although some past works have described various ways in which technology can cause stress in work settings, a rigorous definition of OSN stressors in the voluntary use of IT in social settings has been lacking in the literature. The dimensions of technostress, as defined in this paper, add to the existing concept of stress experienced by users, particularly OSN users. We find that the three dimensions of stressors, information overload, social overload, and techno overload, are significantly and positively related to user strain, namely OSN burnout (supported H1, H2, and H3). This implies that with increase in overload, a user is going to perceive higher level of burnout.

The paper attempts to conceptually explain and empirically validate the relationship between OSN burnout, a strain due to OSN technostress, and users' privacy control intentions as well as discontinuance intentions (supported H4 and H5). Our findings show that stress induced OSN burnout increases users intentions to adopt stricter privacy settings and to discontinue using the OSN altogether. The future extension of this work involves exploring the users' actual behavior with regards to discontinuation and stricter privacy settings. The study extension is expected to shed some light into privacy paradox behavior exhibited by users, where users' actual information sharing behavior does not align with their intentions to share information. If the remaining hypotheses are supported, it would imply that the OSN users are likely to reduce OSN use and use stricter privacy

settings. In both situations, the bottom-line of OSNs gets affected.

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