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*Completed Research Paper*

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## Abstract

*After a sizeable growth and propagation of social networking sites (SNS), there has been a decline on its usage. Studies have shown that this decline caused by the over-influence of SNS on people's life. And people were reacting with a variety of discontinuous behaviors in the service. Prior studies termed this as the SNS fatigue phenomenon and clarified potential factors. However, these studies primarily approached the phenomenon with fatigue as the sole manifest factor. Less attention has been paid on the social features of SNS. In this paper, we view SNS as a social platform; emotion perceived from social features of SNS is an important factor for people to continuously use the service. Based on this view, we employed reactance theory and proposed a reactance model by following two variables; existence of persona non grata and a threat to freedom of usage. Our empirical study on Facebook users (n = 210) revealed that encounter to certain unwelcomed subjects (existence of persona non grata) in the service moderates a social overload. And the social overload acts as a potential antecedent to threat on freedom (trigger of reactance status) to the users of Facebook; ultimately harming the intention for continuation of usage. Implications of research and practice are discussed.*

**Keywords:** Social Media, Social Network Sites, Social Media Fatigue, Facebook Fatigue, SNS Fatigue, Social Overload, Reactance Theory, Persona non grata

## Introduction

In recent decades, SNS (Social Network Sites) has been rapidly propagated. And SNS (i.e. Facebook, Twitter, and QZone) could achieve sizeable growth (Hope 2015) through complementary effect of social demands of people and advanced information technology (Ahn et al. 2007; Maier et al. 2015). Using SNS became common routine of daily life, as it allowed users to attain sense of social embeddedness and following positive emotions; those emotions motivated the users to enjoy SNS continuously; and this cycle does not seem to be ended up.

However, there has been a decline on its usage of the service in recent years. Users complains about over-influence of SNS on their life and were reacting in a variety form of discontinuous behaviors for the service (Kelly 2013). Some IS (Information Systems) researchers argues this phenomenon as "SNS fatigue" (Kim et al. 2013; Maier et al. 2015; Zhang et al. 2015). They found excessive exposure to some SNS features can lead users to be in perceived overload status with following negative emotions and discontinuous behaviors.

Yet, these prior researchers' endeavors for SNS fatigue phenomenon still have viable problems.

First, most prior studies highlight "fatigue" as manifest psychological factor. Relatively less attention was paid on other latent factors that affect users' discontinuous behaviors. Thus, current view does not provide ample explanations about how this fatigue phenomenon is associated with various counter-behaviors of users (i.e. decrease, take a break, stop usage, or move to closed-SNS platforms) toward SNS. IS scholars have discussed about more variety of psychological factors and their dynamic effects on service usage intention (Lee and Lee 2009; Venkatesh et al. 2003). However, other psychological factors with the phenomenon have not sufficiently studied so far.

Second, most prior IS studies underline examining users' characteristics of SNS (i.e. extent of usage or the number of friends). However, numerous records indicate difficulties of SNS users' dealing with specific relationship (i.e. employees to their superior, boss HR staffs and customers, students to professors, or children to parents) while using the service (Baldas 2009; Brandtzæg et al. 2010; MyJobGroup 2010). Their core points were various form of restrictions in usage of SNS, caused by existence of specific person (we call, persona non grata) between SNS and real life. However, no empirical studies were done, focusing social overload and threats of free behaviors within SNS context.

Our study put focus on Facebook context, as we agree on the view of prior studies' that Facebook has the largest size and high impacts. In addition, the fatigue phenomenon is more notable in opened SNS, such as Facebook and Twitter: available for everyone in the WWW, than private SNS, such as Instagram and Line: using by rather closed user group with its inherent privacy protecting structure (Richter and Koch 2008). Based on problems and boundary above, we ask two questions as follows.

- In Facebook usage, how does the specific form of relationship influence the social overloads from Facebook interaction?

- Second, how does social overload lead threat to free usage of service and dissatisfaction of users while using SNSs? How do these constructs influence discontinuous usage intention in SNS context?

To address our questions, we invited reactance theory (Brehm 1966; Brehm and Brehm 2013; Lee and Lee 2009) as a theoretical view. The theory explains various reacting behaviors of the individuals in free or restricted situations caused by any form of subjects. Using the theory, we summarized variables in the proposed research model and conducted a statistical analysis, Partial Least Square (PLS) to explore and examine the new factors in the SNS fatigue phenomenon.

Our study is organized as follows. We first reviewed literatures, and then, we developed hypotheses and research model. With discussing research method and result, we conclude the study with theoretical and practical implication with limitations for future study.

## Literature review

In this study, we reviewed discontinuous behaviors and social aspects of SNS in IS discipline; social condition for reactance in Psychology as a relevant scope of literatures associated with the SNS fatigue phenomenon (Brehm 1966; Brehm and Brehm 2013; Lee and Lee 2009).

### *Rise and fall of SNS, and SNS fatigue phenomenon*

SNS has worked as a mainstream online platform; it facilitates communicating, information sharing and establishing or maintaining social relations of the people (Ellison 2007). From early 2000s, the service could settle down with its proper technical support for social demand of people (i.e. profile, chat, sympathize) (Kent 2008). In addition, drastic popularization of Internet and mobile service in last 2000s helped consolidating the foundation of the service with its mobile-integrated feature. Therefore, SNS could show its remarkable success in last decades; For instance, Facebook could accomplish 360 million users 5 years after its beginning (Piro 2009). And it still plays its active role as one of the largest Internet service in the world with its 1.65 billion active users (Facebook 2016).

The service has been naturally penetrated our daily life and is crucially influencing its users' behaviors. For example, SNS enables people to manage and improve social network more extensively and closely then before (Ellison et al. 2007); the people, user of SNS, are allowed to attain sense of social embeddedness and following positive emotions; such emotions motivate the users to continue SNS usage, and this cycle does not seem to be ended up (Maier et al. 2015).

| Table 1. Users' discontinuous behaviors in SNS fatigue phenomenon | | |
|---|---|---|
| Sources | Counteractions | Summary |
| Goasduff and Pettey (2011) | Decreasing usage of SNS Losing interest of SNS | Users showed their decreasing amount of using the service, comparing with the first usage (24%). |
| Gross (2011) | Leaving SNS | The number of Facebook users in North America significantly decreased; 155.2 million (2011.4) to 149.4 million (2011.5) in USA, and 16.6 million (2011.4) to 15.2 million (2011.5) in Canada. |
| Dixon (2013) | Moving to closed SNS | While using Facebook, various fatigues, incorporating with inferiority complex, drove Japanese users to quit and move to private closed SNS platforms, such as Line. |
| Kelly (2013) | Taking breaks from SNS | 61% of Facebook users answered that they want to take breaks from SNS for several weeks or more. |

**Table 1. Users' discontinuous behaviors in SNS fatigue phenomenon**

However, there has been a decline on its usage of the service. Users complain about over-influence of SNS on their life with negative metaphors (i.e. addiction, jail, or waste) (Robinson 2014). In addition, media found a variety of discontinuous behaviors to the service (Kelly 2013) (See Table 1). IS researchers have argued this phenomenon as "SNS fatigue" (Kim et al. 2013; Maier et al. 2015; Zhang et al. 2015), and they found that excessive exposure to some SNS features can lead perceived overload status with negative emotions with following discontinuous behaviors. All these negative signals were actualized into decreasing growth rate of SNS after its peak in 2012; MySpace, once the second largest SNS, fell down in 2011; Facebook, faced in diminishing number of active users, and so does the QZone, the third largest SNS in China (Zhang et al. 2015).

## Perceived overloads: factor for SNS discontinuance

With respect to SNS fatigue phenomenon, researchers first figured out its empirical ground. For example, they found a linkage that excessive usage of SNS can lead decline of satisfaction; and they assumed it may be ultimately linked to quit of SNS usage (Kross et al. 2013; Yamakami 2012). Then, they proceeded to explore possible factors for discontinuous usage behaviors; they found "perceived overload", caused by excessive amount of some SNS features beyond acceptable degree of users, may be possible antecedents of the phenomenon (Kim et al. 2013; Maier et al. 2015; Zhang et al. 2015).

| Table 2. Perceived overloads in SNS usage | | |
|---|---|---|
| Sources | Concepts | Summary |
| Karr-Wisniewski and Lu (2010); Zhang et al. (2015) | System features overload | Status overloaded by excessive learn too much or too complicated functions. It increases distraction and cognitive burden and decreases the work performance. |
| Yang et al. (2003); Chen et al. (2009); Zhang et al. (2015) | Information overload | Status overloaded by too much information beyond her processing capacity. It negatively influences decision quality and comprehension ability. |
| Deutsch (1961); Lang (2000); Chen and Lee (2013); Zhang et al. (2015) | Communication overload | Status overloaded by a vast amount of complex communication input from diverse sources, multiple channels, with rapid turnaround time. It can lead stress and depression. |
| McCarthy and Saegert (1978); Maier et al. (2015); Zhang et al. (2015) | Social overload | Status overloaded by receiving too much social interactions and related pressures from other users in her social network group. It can lead exhaustion and stress, in a short term, and mental harm, in long term. |

**Table 2. Perceived overloads in SNS usage**

The concept, overload, was originally used for evaluation and perception by the individuals in subjective aspect (Saegert 1973). However, scholars extended the concept to more objective construct, that can describe the perception of kinds of things that exceed individual's ability to handle. Prior

studies clarifiy four types of perceived overloads as latent antecedents in SNS fatigue context; system features overload, information overload, communication overload, and social overload (See Table 2).

To summary, these four perceived overloads appear when some features of SNS affect beyond the capacity of users that they can afford (Zhang et al. 2015). For instance, System features overload (Karr-Wisniewski and Lu 2010) occurs from complexity of the functions of the service exceeds beyond the capability of users. In similar way, information overload appears from excessive amount of information (Chen et al. 2009), communication overload from vast amount of complex communication, multiple channels with rapid turnaround (Chen and Lee 2013), and social overload from too much social interactions and related pressures during SNS usages (Maier et al. 2015).

## Social overload and unwelcomed relationship in SNS

Prior studies found empirical linkage between the overloads and users' discontinuous behaviors. And they found social overload has relatively stronger impact toward discontinuous usage intention among four overload factors (Maier et al. 2015; Zhang et al. 2015). In social overload, Maier et al. (2015) found usage characteristics (i.e. extent of SNS usage, number of friends in SNS) and characteristics of relationship (i.e. types of relationship, subjective social support norm) as the antecedents.

| Table 3. Discussions about potential persona non grata | | |
|---|---|---|
| Sources | Context | Contents |
| Hargittai (2007) | general | *As online actions and interactions cannot be seen as independent from offline activities, constraints on one's daily life are reflected in online behavior, thereby limiting.* |
| Brandtzæg et al. (2010) | family | *Parents began Facebook to monitor their child's activities. SNS regarded as free social space for younger users are affected; new condition of social interaction across generation has been arisen.* |
| Rodewig (2012) | organization | *Soldiers should stop making inappropriate post after returning home, for example, talking negatively about a superior; they don't stop being a soldier at the end of the duty day* |
| Baldas (2009) | organization | *Some comments indicate that employee already know allowing employer access to personal information via SNS can be the reason for any later adverse decision.* |
| MyJobGroup (2010) | organization | *58% of respondents would change their social media profiles if they knew their employer was viewing them; almost 11% saying that they would change almost all of things that they wrote.* |
| | | *Company cannot ignore employees' SNS, as customers are on them, using them and talking about the company.* |
| Broughton et al. (2009) | organization | *SNS tend to blur traditional relationship boundaries; within the work place, SNS can disrupt relationships and hierarchies between employees. And the individuals may consider whether they should 'accept' a Facebook 'friend request' from their boss.* |
| | organization | *If your boss invites you down the pub for a drink. Do you go or don't you go? The company doesn't say you have to go. You could do, but it depends on your relationship with your boss and on the personality of the people involved.* |

**Table 3. Discussions about potential persona non grata**

Indeed, social overload in SNS context seems more complicated than merely sum of social requests. We found several supporting evidences discussing about dynamics of characteristics of relationships in various literatures and sources. For instance, Ljungberg and Sorensen (1998) argue that people feel more socially overloaded when engaged in undesired conversation with certain partners and contexts. Outside of academic literature, some discussions of people are found that people express dislike to interact or even to face with certain subjects based on reality relationship. People call this subject into a buzzword, "Facebook obligate friend". Similar words are found in other countries, such as "SNS Kipi-daesang (SNS 기피대상)" in Korean, or "Kihi-risto(忌避リスト)" in Japanese (Ishikawa 2015; Son 2016). All these terms refer to the subjects whom people do not want to encounter in SNS. The

boundaries of the subjects in the concept vary, but commonly discussed as the subject who may restrict someone's free behavior in SNS. For example, parents (to children), or lovers, or teacher and professors (to students), or senior and boss, or even business partners (to employees) (See Table 3). In our study, we synthesize these similar terms into one term, "persona non grata". The term, persona non grata, has been generally used as the meaning of the 'person not appreciated' in international relation discipline and diplomatic fields (Considine 2007). we consider this term can embody dynamic concept.

### *Social aspect of SNS as provisional factor for reactance*

People tend to consider their freedom importantly. When the freedom is threatened or eliminated by a certain subjects or situation, people form motivational power for recovering it; this restoring power is called psychological reactance, theorized by Brehm (1966). As output of the reactance, people may attempt various negative behaviors. For example, people in reactance status may express opposition, reduce preference, derogate to the threatening subjects as active reaction, or find alternative freedom, giving-up it as passive reactions (Brehm and Brehm 2013).

Prior studies discuss two possible reacting situations in social interactions; direct threat of freedom (when the opponent imposes the obvious social request) and indirect threat of freedom (when the opponent does not impose the obvious social request, but threat is made from self-expectation of oneself by existence of the opponents and intertwining social norm). The former threat can be found in the historical cases of backlash against legal actions (i.e. banning alcohol, increase drinking age limit) (Bensley and Wu 1991) or escaping actions of employees who are forced to overwork (Sibanda et al. 2014). The latter can be found in the case of employees' annoyance when encountering their boss in restaurant accidentally; as they become restricted in their free behaviors in restaurant due to intertwining social norm based on hierarchical social relationship in their organization, even without any obvious social request from the boss (Boogaard 2015).

Yet no prior studies exactly address about the reactance as potential factor for users' discontinuous behaviors in SNS. But as we discussed above, core motivation for using SNS comes from social embeddedness with following positive emotions based on social interactions. And such form can vary depending upon characteristics of relationship (Laumer et al. 2013; Maier et al. 2015).

Like people perceive and care their freedom differently based on disparate interpersonal relation and situations in real life (Heilman and Toffler 1976), SNS users can also deal with freedom differently based on disparate characteristics of relationships in their social interactions. If such freedom is being more threatened in social overload status, they may become more resistant and decrease the intention to user the service (Lee and Lee 2009). Therefore, in this study, we consider psychological reactance as potential factor on users' discontinuous usage of SNS after being socially overloaded.

## Hypothesis development

Based on two prior studies on social network fatigue (Maier et al. 2015; Zhang et al. 2015), we propose a research model in Figure 1. The model consists of Facebook interaction to social overload, social overload to discontinuous usage, mediated by dissatisfaction. We extend the model by embracing potential factors: existence of persona non grata in interaction level and threat to freedom of usage.



**Figure 1.  A Proposed Research Model**
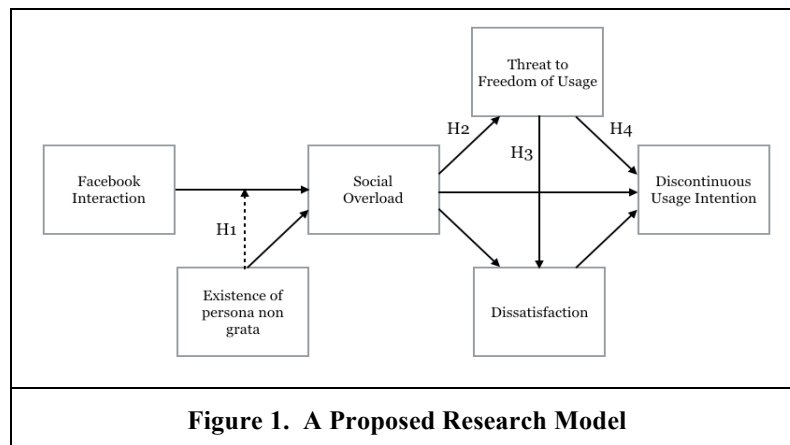
### *Effect of persona non grata*

Prior study discussed excessive SNS usage may lead users to perceive more overloads, as it helps them exposing to various features of SNS that can affect their conation (Zhang et al. 2015). Social aspects of SNS help forming social overload for users that can be work as influential factor for users' SNS discontinuous behaviors (Laumer et al. 2013; Maier et al. 2015).

In SNS, people deal with variety forms of relationships like in their real life. Each of the relationships can affect users' mode of behaviors incorporating with different social support norms (Brass et al. 1998). These social norms vary depending on cognition of users to that specific relationship.

Social overload arises when users feel too much enacted social support, made from other users who also expect responsive supports. In SNS, a space of free behavior for people, some specific relationships from their real life can be associated with social norm of real life, requiring responsive support with stronger pressure in interaction level; we termed this subject as persona non grata above. Thus, this specific characteristics of relationship may positively affect association between Facebook interactions to social overload. Therefore, we propose the following hypothesis:

> *H1. Existence of persona non grata moderates the effects of Facebook interaction on social overloads: Facebook interaction increases social overloads for SNS users with an existence of persona non grata*

### *Effects of Psychological reactance*

Prior studies addressed social overload can be made from excessive social requests in social interactions mingling with two factors, characteristics of relationship and usage characteristics. In the social interaction, effect of two factors can be varied. In other words, people receiving high social overload, made from excessive social requests and stronger social norm, can be in high pressures. In this situation, users can feel restriction on their free behaviors in some forms. For instance, they can feel being restricted by losing free time from responding too many requests (opportunity cost), or by changing priority of their behavior due to stronger request from the other users (Lee and Lee 2009).

According to the reactance theory, the reactance arises when people feel threat or elimination of their freedom on their behavior or decisions. Therefore, we propose the following hypothesis:

> *H2. Social overload is positively related to threats to freedom of usage.*

Prior studies discussed that threat to freedom can lead dissatisfaction of users in service context. For example, Fitzsimons and Lehmann (2004) found threatening freedom of customer in marketing activities can lead dissatisfactions; Chang (2008) supported this by arguing that resistance and satisfaction may be covariant, thereby, those factors are required to be carefully managed with some controls in internet service platform. To sum up, being threatened of one's freedom while using SNS may trigger higher dissatisfaction. Thus, we propose the following hypothesis:

> *H3. Threats to freedom of usage is positively related to dissatisfaction.*

According to the reactance theory (Brehm and Brehm 2013), the threats of freedom negatively affect opinions and behavioral intention toward threatening subjects. Prior studies elucidates that an ignorance of customers or users' freedom may lead negative intention of people in business. For instance, Kivetz (2005) demonstrated that limiting autonomy of customer may harm the intention of people to receive marketing approaches. In IS literature, prior studies found that generated users' resistance while using a service can negatively affect usage intention of the service (Kim and Kankanhalli 2009; Lee and Lee 2009). We considered any threats to freedom of behaviors in SNS can lead similar result. Thereby, we posit the following hypothesis:

> *H4. Threat to freedom of usage is positively related to discontinuous usage intention.*

# Methodology

## *Measurement items and pilot test*

Measurement items were validated from prior studies, except the existence of persona non grata. For instance, items for Facebook interaction were adapted from Chen and Lee (2013), social overloads from Laumer et al. (2013), threat to freedom of usage from Lee and Lee (2009), dissatisfaction from Chang et al. (2014), and discontinuous usage intention from Ravindran et al. (2014). As there was no previously developed scale on existence of persona non grata, three items were self-developed.

The questionnaire was initially developed in English and translated into Japanese (one-way translation). Then, items were refined twice via feedbacks from ten Japanese graduate students (first phase) and 2 IS scholars (second phase) to verify conceptual equivalence between two versions. A pretest was conducted to assess logical consistency, ease of understanding and contextual relevance by four IS scholars who had experience of using SNSs. All measurement items used a seven-point Likert scale (from 1: strongly disagree to 7: strongly agree). The developed items are listed in Appendix.

We did a pilot test with 69 subjects over two weeks to ensure soundness of measurement model; internal reliability, indicator reliability, convergent validity and discriminant validity were checked.

## *Survey administration*

Data was collected in Japan via semi-online survey; a hyperlink to the online questionnaire is shared to number of Facebook groups. The respondents were instructed to answer all questions based on their experiences of using Facebook. To prevent duplicated responses, we recorded and checked IP addresses. During four weeks, 213 completed responses were collected. Finally, 210 samples were analyzed after eliminating 3 incomplete responses.

To sum up demographics, 58% of respondents were male and 42 % of those were female. The majority of respondents (82%) were aged 20-29. 87% had used Facebook more than 2 years (see Table 4)

| Table 4. Demographic profile | | | | | |
|---|---|---|---|---|---|
| Characteristics | Options | % | Characteristics | Options | % |
| Gender | Male | 58.1 | Education | High school or below | 22.9 |
| | Female | 41.9 | | University or College | 56.2 |
| Age | <20 | 2.9 | | Graduate school or higher | 21.0 |
| | ≥20 and <30 | 81.9 | Length of use | <6 months | 2.9 |
| | ≥30 and <40 | 11.0 | | ≥6 months and <1 year | 1.4 |
| | ≥40 and <50 | 3.3 | | ≥1 year and <2 year | 8.6 |
| | ≥50 and <60 | 1.0 | | ≥2 year and <5 year | 54.8 |
| | ≥60 | 0.0 | | ≥5 year | 32.4 |

**Table 4. Demographic profile**

# Result analysis

We used SmartPLS 2.0 (Ringle et al. 2015) to test the model, as PLS method has strong capability for explorative analysis and theory development (Hair Jr et al. 2016). The study followed two-step approach (Anderson and Gerbing 1992) consists of tests of measurement model and structural model.

## *Measurement model*

**Criterion.** According to Hair Jr et al. (2016), the model can achieve sound internal reliability if all Cronbach's alpha and composite reliability values of each item exceed 0.708 thresholds. And, good indicator reliability can be attained when outer loadings values are higher than 0.708 thresholds.

And prior studies suggested thresholds for acceptable validity; AVE values of each construct higher than 0.50 can grant good convergent validity to the model (Bagozzi and Yi 1988). And discriminant validity can be checked via three ways; 1) outer loading values on allocated latent variable should be

higher than outer loading values on any other latent variables (item level); 2) the square root of AVE should be higher than the correlations among the latent variables (construct level) (Fornell and Larcker 1981); All correlation scores are below the 0.85 of threshold (Kline 1998).

| Construct | Alpha | CR | AVE | $\sqrt{AVE}$ | DUI | DS | EP | FI | SO | TF |
|---|---|---|---|---|---|---|---|---|---|---|
| DUI | 0.753 | 0.890 | 0.802 | 0.896 | 1 | | | | | |
| DS | 0.832 | 0.899 | 0.748 | 0.865 | 0.473 | 1 | | | | |
| EP | 0.704 | 0.835 | 0.628 | 0.792 | 0.079 | 0.373 | 1 | | | |
| FI | 0.756 | 0.845 | 0.576 | 0.759 | -0.063 | 0.084 | 0.188 | 1 | | |
| SO | 0.807 | 0.874 | 0.636 | 0.797 | 0.185 | 0.293 | 0.328 | 0.282 | 1 | |
| TF | 0.781 | 0.872 | 0.695 | 0.834 | 0.295 | 0.562 | 0.572 | 0.196 | 0.441 | 1 |

**Table 5. The measurement model**

DUI=Discontinuous Usage Intention; DS=Dissatisfaction; EP=Existence of Persona non grata; FI=Facebook Interaction; SO=Social Overload; TF=Threat to Freedom of usage

**Table 5. The measurement model**

**Reliability.** All our Cronbach' alpha and composite reliability scores of all constructs exceeded 0.7 of threshold (internal reliability test). And all items showed high factor loadings, ranged from 0.718 to 0.902 (See Table 5). To summary, our measure model satisfied adequate level of reliability.

**Validity.** All AVE values for each construct exceeded the threshold 0.5 (convergent validity test). The loadings of each item on its corresponding latent variable were higher than any other constructs; and the square root of the AVE from the construct was higher than the correlations with any other constructs; All correlation scores were all well below the 0.85 thresholds (discriminant validity test) (See Table 5). To sum up, our model exhibited satisfactory validity.

## Structural model

The structure model was assessed based on three criteria; 1) structural paths, 2) t-statistics, and 3) R-square value. Nine structural paths (four hypotheses and five relevant structural paths) were tested.

Existence of persona non grata was found to have a positive interactive moderating effect to the association between Facebook interaction and social overload; H1 (t-value=2.050, p<0.05) was supported. By hierarchical test (Chin et al. 2003), we found significant interactive moderation effect; R-squared value of interaction effect model ($R^2$=0.179) was higher than that of primary effect model ($R^2$=0.158). Applying the Cohen (1992's test, its moderating effect could be considered as small size; as the value of the size effect ($f^2$=0.026) was in the scope of small effect (0.02<$f^2$ < 0.15).
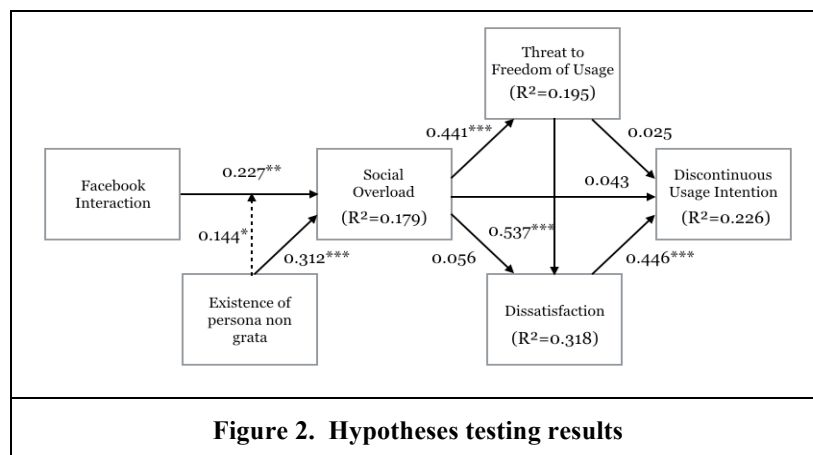


**Figure 2. Hypotheses testing results**

Social overload in Facebook was found to have a positive influence on threat to freedom of usage; H2 (t-value=7.055, p<0.001) was supported. Threat to freedom of usage was also found to have positive effect on dissatisfaction; H3 was supported (t-value = 8.285, p<0.001). However, Threat to freedom of

usage did not have significant effect on discontinuous usage intention; H4 (t-value=0.340) was rejected. Interestingly, several paths that have been supported by prior studies were shown to be not statistically supported; Social overload to dissatisfaction (t-value = 0.842) and discontinuous usage intention (t-value = 0.554) (See Figure 2)

# Conclusion and discussion

In this paper, we conclude the three following things. First, existence of persona non grata moderates association between Facebook interaction and social overload. Second, the social overload is fully mediated to discontinuous usage intention by two factors. Third, threat to freedom of usage and dissatisfaction. Surprisingly, our study cannot find any evidence between social overload to dissatisfaction and discontinuous usage intention, which prior studies argue.

Prior studies argued fatigue and users' characteristics as main factor of SNS fatigue phenomena (Kim et al. 2013; Maier et al. 2015; Zhang et al. 2015); and Maier et al. (2015) extended the view with social aspect of SNS. Yet, the studies remained in considering fatigue as sole manifest variable. Therefore, they were restricted in explaining variety of discontinuous behaviors within diverse social dynamics in the SNS as limitations. Based on this, we proposed an expanded model, focusing on the following two variables: 1) existence of persona non grata and 2) treat to freedom of usage. These two variables support current SNS fatigue phenomena with a view of diverse relationship and reactance theory.

In particular, Facebook users often interact with certain unwelcomed subjects in service usage; of those, persona non grata is a potentially freedom threatening subject coexisting in social networks of both reality and Facebook. Thus, when interacting with them, users may receive stronger pressure which finally intensifies the social overload. And our result empirically supports this moderating role of existence of persona non grata. Also, we suggested social overload as potential antecedent of threat to freedom (trigger of reactance status) to the users in Facebook; and it can ultimately harm the continuous service usage intention. Our result broadly support work of this proposed reactance model. However, the reactance does not directly affect to discontinuous intention, but indirectly expressed as dissatisfaction to the discontinuous intention.

Facebook is a social platform that supports users' social activities; motivation of using the service largely comes from the emotions made from those social activities, such as social embeddedness (Maier et al. 2015); Thereby, we argue that discontinuous behaviors and SNS fatigue phenomenon needs to be considered based on more dynamic view of social relations and interaction, and we think our study result with reactance view deepens our understanding toward the phenomena.

Throughout our study findings, this research makes three contributions. First, it extends the prior studies on social overload in SNS fatigue phenomenon with new perspective, characteristics of relationship and reactance. In IS literature, studies considered negative aspect of SNS is few; they mainly considered usage characteristics are the main cause of fatigue. But our study revealed that characteristic of relationship (i.e. persona non grata) incorporating with arising reactance can be the possible reason of discontinuous behavior of SNS. Second, it found that supporting for free activities of users may be important for sustaining their motivation to use the service. Therefore, SNS providers may put more consideration to how they can support free activities of users in their expanded networks in their service. Third, it examined role of characteristics of relationship in social overload mechanism. With proposing new classification of relationship in SNS context (persona non grata), our study found its moderation effect on association between Facebook interaction and social overload.

The study also has several limitations. First, we used a snowball sampling method. Despite snowball sampling is one of few ways to survey in SNS (Ahn et al. 2007), this limits the generalization of our result to all SNS users. Second, distribution of sample is limited in areas of Japan as well as young generations. As internet usage differs by person, age, and cultures (Lee and Lee 2009), our findings cannot be generalized to all SNS users in the world as well. Future research should consider random sampling with more extensive scope of samples to attain stronger generalizability.

# Appendix

| Measurement items | | | |
|---|---|---|---|
| **Construct** | | **Items** | **Loading** |
| Facebook interaction | FI1 | How often do you upload and share the photos in Facebook? | 0.804 |
| | FI2 | How often do you share web links, news stories, blog posts and notes in Facebook? | 0.718 |
| | FI3 | How often do you click "like" or comment on people`s status, wall, links, or photos in Facebook? | 0.761 |
| | FI4 | How often do you click "like" or comment on Facebook pages of groups, events, organizations, or companies in Facebook? | 0.752 |
| Existence of persona non grata | EP1 | I feel existence of some people bother my Facebook usage | 0.813 |
| | EP2 | I have some unwelcomed friends from real (offline) life in Facebook | 0.789 |
| | EP3 | I want to avoid some of these people in Facebook (e.g. parents, boy/girlfriend, sons/daughters, colleagues, boss, HR staffs, professors, etc.) | 0.776 |
| Social overload | SO1 | I take too much care of my Facebook friends' well-being. | 0.744 |
| | SO2 | I deal too much with my Facebook friends' problems. | 0.741 |
| | SO3 | I am too often caring for my Facebook friends. | 0.839 |
| | SO4 | I pay too much attention to posts of my Facebook friends. | 0.860 |
| Threat to freedom of usage | TF1 | I feel some restriction on my usage of Facebook. | 0.775 |
| | TF2 | I feel something is bothering me in using the Facebook. | 0.866 |
| | TF3 | I feel something is interfere in my using the Facebook. | 0.856 |
| Dissatisfaction | DS1 | I am sometimes not pleased with using Facebook.(Ajzen 1985) | 0.873 |
| | DS2 | I am sometimes not delighted with using Facebook. | 0.887 |
| | DS3 | I sometimes don't like using Facebook. | 0.834 |
| Discontinuous usage intention | DI1 | In the future, I will use Facebook far less than today. | 0.889 |
| | DI2 | If I could, I will discontinue the use of Facebook. | 0.902 |

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