Drivers and Consequences of Frustration When Using Social Networking Services: A Quantitative Analysis of Facebook Users

Full Paper

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Abstract

In this study drivers and consequences of frustration, a negative emotion when using information technology (IT), are theorized and empirically evaluated in a social networking services (SNS) usage context. For example, when users are frustrated by using SNS they might stop using these services. As the number of users mainly determines the value of SNS this paper focuses on frustration while using SNS. It is assumed that both technology and social aspects of SNS usage determine whether users feel frustrated. Empirical evidence can be provided that perceived enjoyment, envy, information overload, and social overload are antecedents of the sentiment frustration. It is also argued that frustration while using SNS will lead to dissatisfaction and discontinued usage. Based on the empirical evidence for this cohesion the paper discusses its theoretical contribution in terms of that discontinuous usage behavior is a coping strategy applied by users to minimize the frustration sentiment.

Keywords

Frustration, SNS, Facebook, Discontinued Usage, Emotions

Introduction

Frustration is a negative emotion which can occur when an individual is not able to satisfy a need due to an intervening obstacle (Lawson, 1965). An example of frustration can be a worker who is doing a good job but still does not receive any rewards because her boss does not like her. Depending on the context frustration can then lead to unwanted outcomes such as aggression (Fox and Spector, 1999), burnout (Seidel, 2011) or withdrawal and resistance (Britt and Janus, 1940). In the context of information technology (IT) usage, outcomes such as resistance have already been researched (Laumer *et al.*, 2014). Also it was shown that negative emotions in general and therefore also frustration can lead to behaviors such as discontinuing using IT (Beaudry and Pinsonneault, 2010; Stein *et al.*, 2015), which is a user resistance behavior, as individuals intend to stop using IT.

This kind of user resistance behavior is especially relevant in the context of IT services. For example, social networking services (SNS), which provide their users with different functionalities such as talking to friends or getting to know new people (Boyd and Ellison, 2007), create their value mainly through a high number of users (Manago *et al.*, 2012). Thus as negative emotions such as frustration have the potential to increase the discontinuance behavior of users (Maier *et al.*, 2015), providers of SNS should try to avoid having frustrated users. Frustration on SNS could occur e.g. by users who do not receive the

message they expected to receive or if individuals do not find a specific person by the search engine of the SNS. Users of the popular SNS Facebook have accordingly also reported frustration after using Facebook (Krasnova *et al.*, 2013).

Thus as frustration as a negative emotion can occur when using SNS and as negative emotions can foster behaviors such as discontinuing using IT, research on frustration in the context of SNS is necessary. However, to the best of our knowledge, frustration in the context of IT usage has rather been neglected by current research. Also Beaudry and Pinsonneault (2010) called in their paper on more research of frustration in the context of IT usage. Furthermore emotions in general do have an influence on IT usage but are often disregarded when doing research in this topic (Koch *et al.*, 2012). Hence as additional insight on frustration as an emotion is necessary research should on the one hand include drivers of frustration to be able to avoid frustration. On the other hand also consequences of frustration are important to find out in how far frustration actually influences discontinuance and to find out whether additional consequences result out of frustration. Therefore we will do research on the antecedents and consequences of frustration. As SNS are one of the most widespread technologies and frustration has already been reported by users of SNS (Krasnova *et al.*, 2013), SNS seem to be an appropriate usage domain when doing research on frustration. In addition Berger et al. (2014) have called in their paper on more research of negative effects when using SNS. Hence our research question is:

What are the antecedents and consequences of frustration when using SNS?

To answer the research question we will do a quantitative analysis. The paper is structured as follows: we will give in section two a short theoretical background on emotions in general and frustration in specific. In section three we will present our research model to propose hypotheses for antecedents and outcomes. This section is followed by section four where we will provide our methodology. Section five will present the quantitative analysis and results of section five will be discussed in section six where implications for theory and practice will be given.

Theoretical Background

Frustration as an Emotion in IS Research

As frustration is an emotion we will first explain emotions in general and then address frustration in specific. Emotions are defined as "*a mental state of readiness that arises from cognitive appraisals of events or thoughts*" (Bagozzi *et al.*, 1999, p. 184). In the context of IT this means that emotions as a mental state occur through assessing an IT event (Beaudry and Pinsonneault, 2010). When doing research on IT usage, emotions of an individual do play a role on whether IT is used (Beaudry and Pinsonneault, 2010). However, past research has focused mainly on cognitions as the primary driver of IT usage (Beaudry and Pinsonneault, 2010). For example the popular technology acceptance model (TAM) (Davis, 1989) is using cognitive instruments to explain the actual usage behavior of individuals. To better understand and use emotions besides cognition in the context of IT usage, Beaudry and Pinsonneault (2010) classify emotions in the context of IT by four categories on two appraisals: is the IT considered as an opportunity or a threat (first appraisal) and in how far individuals think they have control over a given event (second appraisal). Depending on the categorization, four different types of emotions can occur: on the one hand achievement emotions (opportunity and lack of control) and challenge emotions (opportunity and control) which are both positive emotions. On the other hand deterrence emotions (threat and control) and loss emotions (threat and lack of control) which are both negative emotions.

Frustration can be seen as a loss emotion i.e. a user who is frustrated with an IT considers the IT to be a threat and also has no control over the event triggered by the IT (Beaudry and Pinsonneault, 2010). Using another definition frustration occurs when there is an impediment which hinders an individual to satisfy a need (Lawson, 1965). Putting Beaudry and Pinsonneault (2010) and Lawson (1965) information about frustration together one can say that frustration is caused in an IT-related event the individual does not have control over and the event is seen as a threatening obstacle to satisfy a need. For example as stated above users of SNS might be frustrated because they do not find another individual by the search-engine of the SNS. This is because the event is IT-related and the individual does not have control over finding that other individual. The event is either controlled by the provider of the SNS or by the other individual

who does not want to be found on the SNS. Furthermore the IT is seen as a threat by the user because it prevents the individual to satisfy her need.

Frustration has been used in IS research to better understand technology acceptance (Ortiz *et al.*, 2014; Pallud and Elie-Dit-Cosaque, 2011), to show consequences of satisfaction in the context of web site quality (Ethier *et al.*, 2004) or as determinants of privacy beliefs (Li and Sarathy, 2006). Also in the context of SNS, frustration has been researched (Krasnova *et al.*, 2013), but consequences of frustration have been neglected. Additionally antecedents causing frustration have only been researched by Krasnova et al. (2013) in an exploratory but not in a confirmatory way. We try to fill this research gap by presenting our research model in the following section.

Research Model

For the antecedents of frustration in our research model we will on the one hand use technology aspects of the SNS and on the other hand social aspects. Technology aspects will be used because we are doing research in the context of a technology. Social aspects (e.g. social relationships and social embeddedness) will be used in addition because they are at the core of SNS (Junglas *et al.*, 2013; Maier *et al.*, 2014). In the following two sections we will present technology aspects and social aspects we used to build our research model (see Figure 1) in more detail.

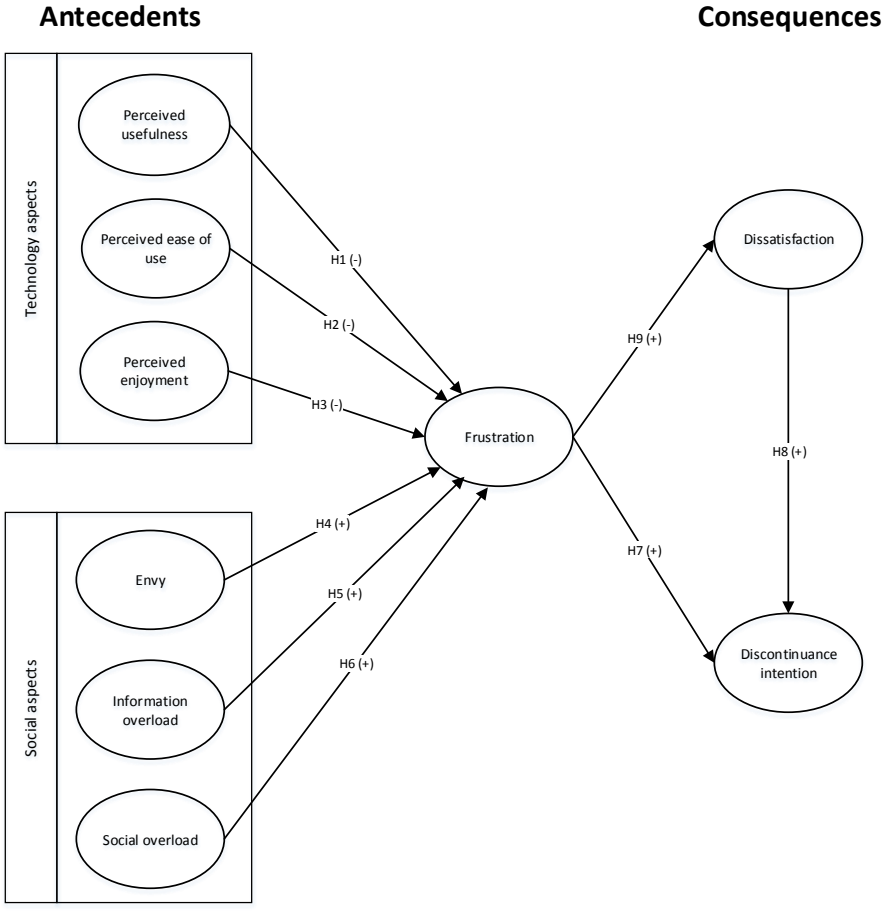

Figure 1, Research model

Antecedents of Frustration

Technology Aspects of Using SNS

The TAM with its two constructs perceived usefulness (PU) and perceived ease of use (PEOU) (Davis, 1989) is one of the most popular theories in IS research (Jeyaraj *et al.*, 2006; Williams *et al.*, 2009). PU is the degree of perception of an individual in how far the usage of a technology increases her performance (Davis, 1989). PEOU refers to the degree of perception of an individual in how far she thinks the usage of the technology is free of effort (Davis, 1989). The TAM was extended by van der Heijden (2004) who added perceived enjoyment (PE) as an additional construct in order to explain hedonic usage. PE "*specifies the extent to which fun can be derived from using the system*" (van der Heijden, 2004, p. 697). Since we want to keep a preferably parsimonious model and the TAM has been used and validated many different times we will use the two constructs PU and PEOU in our research model. Additionally we will use PE of the extended model since enjoyment is one of the goals of SNS usage (Lin and Lu, 2011). Hypotheses will be built in the following.

Ayyagari et al. (2011) used PU and PEOU in their paper to show that both have a negative impact on exhaustion as one specific emotion. This is because the easier a technology is to use and the more useful it is the less exhausted a user will be. Similar thoughts can be made with frustration. The higher the PU and the higher the PEOU of a technology is the less frustration will occur and vice versa. Accordingly it was shown that low PEOU leads to frustration (Cenfetelli, 2004; Venkatesh, 2000). This is because the likelihood that the need of an individual can be satisfied is higher when the technology is useful and easy to use. Both relationships should also fit to SNS because both PU and PEOU are important when using SNS (Carlota Lorenzo-Romero *et al.*, 2011; Lin and Lu, 2011). For example, PU of a SNS might be high when one can send text-messages to more than one individual in a fast way. Also PEOU of a SNS might be high when the messaging-system is easily understandable. Frustration could occur if the text-messages cannot be sent or if the messaging-system is hard to use, because the needs of the user are not satisfied. We thus hypothesize the following:

H1: The higher the perceived usefulness the lower the frustration.

H2: The higher the perceived ease of use the lower the frustration.

PE occurs when an individual experiences fun while using the technology (van der Heijden, 2004). It can therefore be seen as a positive emotion (Beaudry and Pinsonneault, 2010). In past research it was shown that through positive emotions the perception of negative emotions is reduced (Fredrickson *et al.*, 2003). Therefore as PE is a positive emotion it should reduce frustration as a negative emotion. Hence we hypothesize the following:

H3: The higher the perceived enjoyment the lower the frustration.

Social Aspects of Using SNS

Social aspects are commonplace in our world today when using IT. This is especially true in the context of SNS where the social aspect is at the core of (Junglas *et al.*, 2013; Maier *et al.*, 2014). Thus social aspects should be included when investigating users of SNS. After performing a literature review we identified three constructs which seemed to be appropriate for using them in the context of frustration and SNS: 1) envy (Krasnova *et al.*, 2013) which seems to be one of the main drivers of frustration in SNS. 2) Information overload (Cenfetelli and Schwarz, 2011) which occurs when being on SNS (Koroleva *et al.*, 2010) and which can have an influence on frustration (Tarafdar *et al.*, 2010) and 3) social overload (Maier *et al.*, 2014) which is one of the main constructs when doing research in SNS and also explains similar constructs as frustration e.g. SNS exhaustion. Details about the constructs and built hypotheses will be given in the following sections.

Envy is defined as "*occurring when a perception exists that a person lacks another's superior quality, achievement, or possession and either desires it or wishes that the other lacked it*" (Parrott and Smith, 1993, p. 906). For example if someone is buying a new car another individual could be envious of the owner of the car because she also wants to have that car. In the context of SNS envy could be especially important because through the technique of SNS it is very easily possible to see achievements or possessions of a large group of people. For example a US-user of the popular SNS Facebook has 350

friends in average (Statista.com, 2014) and can hence receive information such as pictures from holidays from a high number of individuals. By using SNS it is also possible to have access to the achievements or possessions of individuals someone would usually not have contact to e.g. of celebrities. For example 30 percent of the friends on Facebook of an average US-teen are celebrities (Statista.com, 2012). Celebrities will probably have more achievements or possessions a "normal" user will have and this might lead to envious "normal" users. Thus envy can be especially important in the context of SNS. This was also shown in a research study where users reported envy after using Facebook (Krasnova *et al.*, 2013). If one connects envy to frustration in the context of SNS, users could become frustrated because they are envious of other users due to their achievements or possessions. For example a user of a SNS could become envious of another user because she sees pictures of the other user being on holiday. Outgoing of this envy the user could build a need – also going on holiday – which cannot be satisfied due to an obstacle – e.g. not having enough money. The result could be that the user becomes frustrated. Accordingly Krasnova et al. (2013) found out in their exploratory paper that people became frustrated because they were envy. Thus we hypothesize:

H4: The higher the envy the higher the frustration.

Information overload is defined as "*too much information [which] is provided beyond the user's needs resulting in perceptions of being overwhelmed*" (Cenfetelli and Schwarz, 2011, p. 815). Information overload therefore relates to a state of overextension since the individual has too much information she cannot evaluate. This also leads to a lower level of technology acceptance (Cenfetelli and Schwarz, 2011). Hence – as frustration also has the potential to reduce the level of technology acceptance (Beaudry and Pinsonneault, 2010) – it is possible that information overload positively influences frustration. Relating information overload with the definition of frustration (Lawson, 1965) information overload would then be the obstacle to satisfy a need, e.g. receiving only important information. Information overload could then in turn lead to frustration. This was also shown e.g. in the context of organizations where information overload can lead to frustration (Tarafdar *et al.*, 2010) or in the context of financial investors (Ho and Tang, 2001). Since in SNS users can experience information overload (Koroleva *et al.*, 2010) and based on the presented relationships between information overload and frustration we hypothesize the following:

H5: The higher the information overload the higher the frustration.

Social overload is defined as a "*negative perception of SNS usage when users receive too many social support requests and feel they are giving too much social support to other*" (Maier *et al.*, 2014, p. 2). Hence social overload can occur in the context of SNS usage. To the best of our knowledge none of the current research has researched social overload in relation to frustration. However, social overload can be seen similar to information overload because both are states of overextension. Also both lead to a lower level of technology acceptance and usage (Cenfetelli and Schwarz, 2011; Maier *et al.*, 2014). Since for information overload it was already shown in different settings that it positively relates to frustration we also argue that social overload can positively influence frustration. For example one could have the need to socialize with others and having a good time when using SNS. When experiencing social overload this need cannot be satisfied anymore because of too many social support requests. We therefore hypothesize:

H6: The higher the social overload the higher the frustration.

Consequences of Frustration: Dissatisfaction and Discontinuance Intention

Emotions in general have the potential to influence the usage of IT (Beaudry and Pinsonneault, 2010). The actual usage behavior then determines the number of actual users of a SNS which is an important variable in the SNS context (Manago *et al.*, 2012). As the actual usage behavior is strongly determined by the intention to use (Davis, 1989; Venkatesh *et al.*, 2003), the intention to use SNS is also an important variable. Positive emotions will positively influence the intention to use a technology whereas negative emotions will negatively influence that intention (Beaudry and Pinsonneault, 2010). Frustration as a negative emotion therefore has the potential to negatively influence the intention to use SNS. Therefore it seems more appropriate not researching on the intention to use SNS but on the intention to discontinue using SNS. This is in line with other researchers who studied on negative emotions in the context of SNS and found out that they positively influence the intention to discontinue using a technology (Chang *et al.*, 2014; Maier *et al.*, 2015). Therefore we hypothesize:

H7: The higher the frustration the higher the intention to discontinue using SNS.

One of the main drivers of the intention to discontinue using IT is dissatisfaction (Bhattacherjee and Lin, 2014; Parthasarathy and Bhattacherjee, 1998). This could be shown e.g. in the context of switching to cloud computing (Bhattacherjee and Park, 2014) or herd behavior (Sun, 2013). Dissatisfaction then leads to the intention to discontinue using a technology (Parthasarathy and Bhattacherjee, 1998; Sun, 2013). In line with other researchers (Chang *et al.*, 2014; Xu *et al.*, 2014) we assume that this relationship will also be true in the context of SNS. Thus we hypothesize:

H8: The higher the dissatisfaction the higher the intention to discontinue using SNS.

By the definition of Lawson (1965) frustration means that the needs of an individual could not be satisfied. Hence the expectation of an individual (to satisfy a need) was negatively disconfirmed (because it was not satisfied) when the individual is frustrated. As negative disconfirmation leads to a lower degree of satisfaction (Lankton and McKnight, 2012; Oliver, 1977, 1980) we hypothesize:

H9: The higher the frustration the higher the dissatisfaction.

Methodology

The aim of our research is to find out what drives frustration in the context of SNS usage and what are its consequences. To answer our research question we were sending e-mails to e-mail addresses we have collected in an external study with a project partner over a couple of years. In the e-mail we asked the participants if they want to conduct in our Facebook study and also included a link to our online study. Facebook seemed to be appropriate when doing research on SNS because of its high number of users and prevalence (Statista.com, 2015). The field study was conducted with a total of 461 participants. We then removed participants who said that they do not use Facebook, participants with inconsistent data (e.g. knowing more Facebook friends in reality than actually having friends on Facebook) or participants with unrealistic data e.g. having a million friends. We ended up with a total of 421 participants. The demographics can be seen in Table 1. The questions which were asked during the field study can be seen in Table 3 in the appendix. For the analysis of the data we performed a partial least square (PLS) approach by using the software SmartPLS 3.1.9 (Ringle *et al.*, 2014). Details and results are explained in the next section.

Gender	Men	58.30%
	Women	41.70%
	Mean	SD
Age	38.81	11.52
Number of friends on Facebook	238.1	220.15
Average time spent on Facebook in minutes per day	38.81	54.28
Period of Facebook usage (in years)	5.27	1.86

Table 1: Demographics of the 421 participants

Data Analysis and Results

Through performing a PLS-approach we were able to assess both a measurement model and a structural model (Barclay *et al.*, 1995; Chin, 1998). Also by using a PLS-approach the impact of common method bias (CMB) can be evaluated (Liang *et al.*, 2007; Podsakoff *et al.*, 2003). Thus a PLS-approach seemed to be appropriate in our study. Based on the rule of 10 the minimum number would be 60 participants. Thus the 421 participants in our study are enough to validate our model (Hair *et al.*, 2011). We start the analysis by evaluating the CMB which can occur when doing research on survey data.

CMB-test: When using surveys where individuals can self-report their data a CMB can occur which may influence the given data (Podsakoff *et al.*, 2003). We thus have done a CMB-test by employing the Harman's single factor test. This test indicates if a single factor can explain the majority of the variance.

After performing the test results have shown that only 27.26 percent can be explained by a single factor. Hence it seems that CMB does not distort the results.

Measurement model

In our measurement model we were only using reflective indicators. Hence different validations have to be done which are presented in this section (Bagozzi, 1979). To have a high **content validity** we were using already existing measurement items and adapted them to the context of Facebook. Items with references can be seen in Table 3 and also values for Cronbach alpha which all exceed the widely recommended value of 0.70.

Indicator reliability: To explain more than 50 percent of the variance of the latent variables the values of the indicators should be greater than 0.707 (Barclay *et al.*, 1995; Carmines and Zeller, 1979). Table 3 shows that this is true for all indicators used in our model. Also after employing bootstrapping with 1,000 samples all indicators are significant.

Construct reliability: To assess the reliability of the constructs, composite reliability (CR) and average variance extracted (AVE) are used. CR should be higher than 0.8 (Nunnally, 1978) and AVE greater than 0.5 (Fornell and Larcker, 1981). Both is true in our model as can be seen in Table 2.

Discriminant validity: By using discriminant validity one can assess in how far the items differ from each other (Campbell and Fiske, 1959). As it is shown in Table 2 the square root of AVE is greater than the correlation of every construct with each other (Barclay *et al.*, 1995; Gefen and Straub, 2005). However, the heterotrait-monotrait (HTMT) ratio is more reliable in finding a lack of discriminant validity than the Fornell-Larcker criterion (Henseler *et al.*, 2014). Hence we also use it to evaluate discriminant validity. When using the most conservative approach with $HTMT_{0.85}$ our results show that our data does not lack of discriminant validity. The highest correlation value in our data is modulus 0.807 between PE and dissatisfaction.

As all tests have passed we conclude that our measurement model is valid.

	Construct	Mean	SD	AVE	CR	1	2	3	4	5	6	7	8	9
1	Information overload	2.83	1.55	0.803	0.924	**0.896**								
2	Envy	2.63	1.72	0.766	0.958	0.389	**0.875**							
3	Social overload	2.18	1.25	0.633	0.896	0.356	0.379	**0.795**						
4	Perceived enjoyment	4.78	1.21	0.783	0.948	-0.193	0.060	0.003	**0.885**					
5	Perceived usefulness	5.19	1.25	0.783	0.915	-0.061	0.166	0.044	0.651	**0.885**				
6	Perceived ease of use	5.49	1.58	0.722	0.912	-0.366	-0.064	-0.198	0.244	0.243	**0.850**			
7	Frustration	2.91	1.50	0.873	0.954	0.451	0.328	0.301	-0.396	-0.219	-0.270	**0.934**		
8	Dissatisfaction	3.52	1.27	0.721	0.928	0.260	0.020	-0.014	-0.744	-0.628	-0.339	0.458	**0.849**	
9	Discontinued usage intention	2.76	1.48	0.625	0.893	0.222	0.113	0.129	-0.561	-0.490	-0.274	0.436	0.671	**0.791**

Bold values are the square roots of the AVE

Scale ranges from 1 (totally disagree) to 7 (totally agree) by using a 7-point-Likert scale

Table 2: AVE, CR, Fornell-Larcker criterion, and bivariate correlations

Structural model

Results indicate that the antecedents explain 36.6 percent of the variance of frustration. Furthermore, frustration and dissatisfaction together explain 47.1 percent of the variance of discontinued usage intention and frustration also explains 21.0 percent of the variance of dissatisfaction.

After doing bootstrapping with 1,000 samples, results revealed that envy, social overload, information overload and PE significantly influence frustration. The influence of PU and PEOU is not significant. The influence of frustration on dissatisfaction and discontinued usage intention together with the influence of

dissatisfaction on discontinued usage intention is significant. Thus except for H1 and H2 all hypotheses were supported. Path coefficients can be seen in Figure 2.

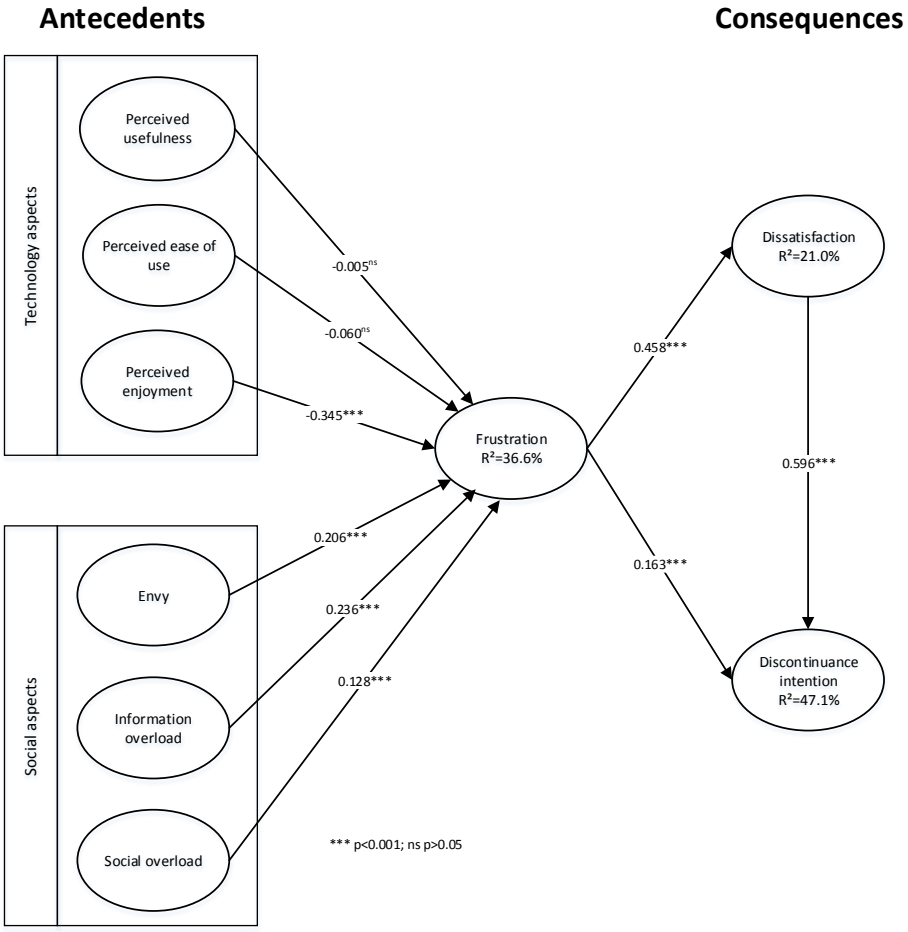

Figure 2: Path model results

Discussion

This work investigates both the impact of frustration and its antecedents in the context of SNS-usage. Research was done in the context of Facebook with 421 participants. Results have shown that frustration can even occur when using hedonic IT such as SNS. It positively influences discontinued usage intention and dissatisfaction. Dissatisfaction in turn influences discontinued usage intention. In addition envy, social overload, information overload and PE could be identified as antecedents which influence frustration. 36.6 percent of the variance of frustration could be explained and 47.1 percent of discontinued usage intention as a dependent variable. A detailed discussion and implications for theory and practice are given in this section together with guiding for future research.

This work contributes to current theory in the area of technology acceptance by several implications: First we answered the call of Beaudry and Pinsonneault (2010). In their article it was shown that emotions in general do have an influence on technology acceptance. Still, they asked for further research on frustration among others because in past research technology acceptance was mainly investigated by cognitive models i.e. emotions have rather been neglected (Koch *et al.*, 2012). We answered this call by researching on frustration in the context of SNS. Our results reveal that frustration has an influence on discontinued usage intention and thus a negative influence on technology acceptance. However, results reveal that the influence of frustration on dissatisfaction is much higher than on discontinued usage

intention. In turn, dissatisfaction also strongly influences discontinued usage intention. Thus this work shows that frustration is not the main predictor of discontinued usage but dissatisfaction is which is in line with other research (e.g. Bhattacherjee and Park, 2014). However, dissatisfaction in turn is mainly influenced by frustration. We therefore contribute to the research stream of Beaudry and Pinsonneault (2010) and others who did research on discontinued usage intention (Maier *et al.*, 2015; Sun, 2013; Turel, 2014) by showing that emotions indeed do have an influence on technology acceptance but that the influence of frustration on discontinued usage might be mediated by dissatisfaction. Future research could focus on this relationship by researching other negative emotions in relation with dissatisfaction and by doing a mediation test.

Second, this paper might also contribute to coping strategies. Several coping strategies e.g. social support can be used to cope with existing negative emotions (Beaudry and Pinsonneault, 2010; Stein *et al.*, 2015). As individuals try to reduce negative emotions to avoid negative outcomes such as anger or dissatisfaction they try to cope with their negative emotions. The results have revealed that an outcome of frustration is to discontinue the usage of SNS. Hence our results contribute to the coping research stream by showing that discontinued usage could be a coping strategy of frustration when using SNS. Future research could try to focus on that aspect to find out in more detail how discontinued usage can be used as a coping strategy for frustrated users.

Third, we have also researched on the antecedents of frustration. It was shown that envy, social overload, and information overload positively influence frustration whereas PE negatively influences frustration. PE here is the main predictor of frustration. However, PU and PEOU do not influence frustration in the context of SNS. These results on the one hand contribute to the explorative work of Krasnova et al. (2013) in the way that envy as an antecedent of frustration could be confirmed and that additional antecedents such as information overload and social overload could be identified. On the other hand the results show that PU and PEOU which are both perceptions and not emotions do not have a significant influence on frustration. This might be because of the hedonic nature of SNS where it was shown that the influence of PE is higher than of PU (van der Heijden, 2004). Results could also be interpreted in the way that positive beliefs (PU and PEOU) do not have an influence on negative emotions but negative cognitions (information overload, social overload and envy) and positive emotions (perceived enjoyment) do have an influence on negative emotions. This would also correspond with current research (Cenfetelli and Schwarz, 2011). However, data and results are not valid enough to generalize these thoughts. Hence future research could investigate in how far this might be true in other research settings.

Fourth, we contribute to SNS research in general. Past research has mainly focused on positive outcomes of SNS-usage and has rather been neglected negative outcomes when using SNS (Berger *et al.*, 2014). Berger et al. (2014) therefore called for more research on negative outcomes when using SNS. We answered that call by showing that frustration is an emotion which can be perceived by SNS-users and hence should be considered when doing research on SNS. Future research could use this construct on the one hand as an antecedent e.g. of dissatisfaction or on the other hand as an emotion which directly influences the acceptance of SNS. Also to better measure frustration future research could try to create stronger measurement items for frustration as a construct and thus helping in better identifying frustration as an emotion.

In addition this work also has practical implications for SNS providers. As the ultimate goal of SNS providers is to retain as many users as possible because they mainly determine the value of a SNS (Manago *et al.*, 2012) SNS providers should try to avoid having frustrated users because frustration leads to discontinuance intention. Results have shown that PE is the main predictor of frustration which negatively influences frustration. Hence SNS providers could try to enjoy their users to reduce frustration. Information overload as the second highest antecedent of frustration should also be considered by SNS providers. To reduce information overload SNS providers could try to show their users only the kind of information they really care about e.g. by spam filters.

Limitations

The results also have several limitations. The study was only done in the context of Facebook. Future research could investigate if the results also fit in other SNS e.g. Twitter or YouTube. In addition the study was only done in a voluntary context. In future research it could be examined in how far the results also fit

with other technologies in a mandatory context e.g. an ERP-software in organizations. Also the number of antecedents is limited. Other constructs such as stress or jealousy could be used to maybe better explain frustration. The constructs and relationships between them were used in a more exploratory way to find out in how far they are connected to each other. We are aware of that the choice of the constructs is in some way limited, so that future research might use other constructs as examples for technology and social aspects.

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Appendix

Construct and Cronbach's alpha	Items	Loadings	Reference
Information overload (α=0.878)	I receive more information on Facebook than I can handle.	0.910	Adapted from: (Misra and Stokols, 2011; Roberts and O'Reilly, 1974; Schultz and Vandenbosch, 1998)
	I'm overwhelmed with the information displayed on Facebook.	0.919	
	I'm confronted with an excessive amount of meaningless information on Facebook.	0.859	
Envy (α=0.949)	While I'm on Facebook I find myself being envious of others who have already seen more of the world.	0.805	Adapted from: (Krasnova *et al.*, 2013)
	While I'm on Facebook I find myself being envious of others who are more successful than me.	0.885	
	While I'm on Facebook I find myself being envious of others due to their skills.	0.862	
	While I'm on Facebook I find myself being envious of others because they are so happy.	0.923	
	While I'm on Facebook I get the impression that many of my friends do have a better life than me.	0.920	
	While I'm on Facebook I get the impression that others are more happy than me.	0.898	
	While I'm on Facebook the impression is created that life is not fair.	0.827	
Social Overload (α=0.865)	I take too much care of my friends' well-being on Facebook.	0.746	Adapted from: (Maier *et al.*, 2014)
	I deal too much with my friends' problems on Facebook.	0.792	
	My sense of being responsible for how much fun my friends have on Facebook is too strong.	0.762	
	I am too often caring for my friends on Facebook.	0.841	
	I pay too much attention to posts of my friends on Facebook.	0.831	
PE (α=0.930)	Using Facebook is enjoyable.	0.842	Adapted from: (Davis *et al.*, 1992; Turel and Serenko, 2012)
	Using Facebook is pleasurable.	0.900	
	Using Facebook is fun.	0.937	
	Using Facebook is exciting.	0.831	
	Using Facebook is interesting.	0.911	
Perceived usefulness (α=0.876)	Using Facebook is useful to stay in contact with friends.	0.858	Adapted from: (Brown and Venkatesh, 2005; Maier *et al.*, 2015)
	Using Facebook is useful to communicate with friends.	0.842	
	Overall, using Facebook is useful.	0.950	
Perceived ease of use (α=0.872)	The interaction with Facebook is clear and understandable.	0.849	Adapted from: (van der Heijden, 2004)
	Interaction with Facebook does not require a lot of mental effort.	0.846	
	I find Facebook easy to use.	0.816	
	I find it easy to get Facebook to do what I want it to do.	0.886	
Frustration (α=0.927)	Using Facebook is sometimes frustrating for me.	0.916	Adapted from: (Ortiz *et al.*, 2014)
	While being on Facebook I sometimes feel frustrated	0.952	
	Overall, I experienced sometimes frustration while being on Facebook	0.935	

Dissatisfaction (α=0.903)	I'm displeased with using Facebook.	0.857	Adapted from: (Bhattacherjee, 2001)
	I'm discontent with using Facebook.	0.815	
	I'm unhappy with using Facebook.	0.872	
	I'm dissatisfied with using Facebook.	0.833	
	Overall, I have a negative opinion about Facebook.	0.866	
Discontinued Usage Intention (α=0.849)	I intend to delete my profile rather than continuing using Facebook.	0.851	Adapted from: (Maier *et al.*, 2014; Turel, 2014)
	In the future, I will use another social network site.	0.744	
	If I could I would like to stop using Facebook.	0.782	
	I will unregister in Facebook.	0.823	
	In the future, I will use Facebook far less than today.	0.749	
Note: Scale ranges from 1 (totally disagree) to 7 (totally agree) by using a 7-point-Likert scale			

Table 3: Measurement items with loadings