

# **SOCIAL NETWORKING CONTINUANCE: WHEN HABIT LEADS TO INFORMATION OVERLOAD**

*Complete Research*

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## **Abstract**

*In this paper, we propose an explanatory model of the continuance intention to use social networking sites (SNS). Our aim is to extend the post adoptive model by incorporating Habit and Information Overload as antecedents to SNS continuance intention. A quantitative approach based on an online survey administered to 320 executive managers in France confirms the positive role of habit in generating information overload and in positively affecting SNS continuance intention. The results also show that satisfaction and perceived usefulness do not seem to play any significant role.*

*Keywords: Social networking sites, post adoption model, continuance of usage, Habit, Information overload.*

## **1 INTRODUCTION**

The growth of Social Networking Sites (SNS) increasingly challenges their main purpose: information processing and sharing. This is partly due to what we call Information Overload; a relatively well known issue in the MIS field, which is especially studied within the professional settings (Eppler and Mengis, 2004) to measure the impacts produced on individual and organizational performance. Now, Information overload is becoming an overwhelming societal phenomenon, and this is due in part to the large diffusion of web 2.0 communication media, amidst them SNS. Indeed, while people are more and more willing to increase their social capital (Enders et al., 2008; Steinfield et al., 2008; Pfeil et al., 2009 ; Valensuela et al., 2009) and to enhance their visibility in and even outside their respective social networks (Dowan, et al., 2007; Stieglitz and Dang-Xuan, 2013), they may find themselves submerged by a huge amount of information and therefore less able to use it efficiently. Why then continue to use those SNS (Hu et Kettinger, 2008; Wang et Xu, 2008)? Is it just a question of ‘Habit (Turel and Serenko, 2011; Ko, 2013; Guopeng and Ling, 2014)? And to what extent is information overload likely to hinder the continuous usage of SNS?

We argue following the Management Information Systems (MIS) continuous literature (Battacherjee, 2001; Kim and Malhorta, 2005; Ortiz de Guinea and Markus, 2009), that the viability of any information system depends as much on its continued usage (post-adoption stage) as on its initial adoption (adoption first stage). We therefore propose to focus on the SNS continuance as a post-adoptive mechanism using the Post-Adoptive-Model (Battacherjee, 2001; Battacherjee and Premkumar, 2004) and to examine the roles of Habit (Limayem et al., 2007; Turel and Serenko, 2011) and Information Overload (Shultz and Vandenbosch, 1998; Pennington and Tuttle, 2007) respectively in enhancing and impeding SNS usage over time. We will investigate the possible linkage between these two factors and whether they are related to the antecedents of SNS continuance. We argue here that it is important to investigate such a phenomenon through the lens of the user before developing any technical or organi-

zational solutions intended to limit the negative effects of information overload generated by SNS problematic use (i.e. use generating decreasing performance, unethical behavior, addiction, etc.).

The leading journals in the MIS discipline do not sufficiently cover those issues, especially the linkage between habit, information overload and IS continuance. The present paper is aimed at filling this gap. Our research design is fully positivistic and led us to conduct a survey with a sample composed of 320 executive managers all of whom are alumni of a French Business School. Such a population (executive managers) is reputed to be potentially concerned by information overload (Oldroyd and Morris, 2012) and may therefore constitute a relevant research field. In this paper, we will first proceed to a brief overview of our theoretical foundations. Then we will present our research methodology and our major findings. Finally, we conclude by identifying the theoretical and managerial implications of our study and the future research perspectives it can afford.

## **2 THEORETICAL FOUNDATIONS**

Our focus will first be put on the concept of IS continuance of usage and how it has been addressed within the research on SNS and social media. Then, we will explain the factors of interest in this research, namely Habit and Information Overload.

### **2.1 IS Continuance Theory**

We can see that an important part of the MIS literature is devoted to the initial adoption stage of a technology. A large number of studies have examined the motivations and antecedents of the first use of IS. An example of a seminal work or model in this field is the Technology Acceptance Model (Davis, 1989; and Davis et al. 1989) which states that technology acceptance depends upon two key beliefs: perceived usefulness and perceived ease of use. Improvements and enrichments have been made to this basic model (Davis et al., 1992, Venkatesh and Davis 2000, Venkatesh et al., 2003) by integrating other variables; such as perceived enjoyment (Davis et al., 1992), subjective norms, usage experience, image (Venkatesh and Davis, 2000), expected performance, expected effort, social influence, anxiety, facilitating conditions (Venkatesh et al. 2003; Garfield, 2005), etc. This prolific literature is rooted in a social psychological tradition in which the theory of reasoned action (Ajzen and Fishbein, 1980) and the theory and planned behavior (Ajzen, 1985, 1991; Venkatesh and Brown, 2001; George, 2004) have played an important role. During the last decade, a consensus seemed to appear: first acceptance does not offer any guarantee of the long-term viability of a given IS. The post-adoptive research era has begun, remarkably influenced by Bhattacharjee (2001) who was among the earliest to conceptualize and test a theoretical model of IS continuance (Post-Acceptance Model of IS Continuance or Post-Adoptive Model : PAM) based on Expectation-Confirmation Theory: ECT (Oliver, 1980). This model aims to assess the IS continuance through the concept of IS Continuance Intention (the dependent variable of the model) and identifies: confirmation (of expectations through IS prior usage), the perceived usefulness of this IS, as well as the degree of satisfaction experienced by the user, as the antecedents of this intention. Further works have since that time been developed and have identified multiple other antecedents of IS continuance. In particular, Limayem and al. 2003; 2007) have outlined the temporal dimension of this mechanism. IS continuance is defined as follows: “all forms of behavior that reflect continued use of an IS [...] and ending with the final decision of the user to stop this use” (Limayem et al., 2007, p. 707). More recently, Ortiz de Guinea and Markus (2009) have proposed to sort the factors underlying the continuous usage decision into two categories: the cognitive and the emotional factors.

Not surprisingly, research particularly devoted to SNS Continuance seems to be also based upon the same underpinnings: the Expectation –Confirmation Theory (ECT) (Chang and Zhu, 2012), the PAM (Bohringer and Barnes, 2011); the TPB model (Kefi et al., 2010); and the motivation theory (Donaldson and Duggan, 2011) to cite a few.

## **2.2 Habit**

Limayem et al. (2007) have provided a comprehensive review of the literature on IS habit. They have sorted 43 studies on Habit and proposed the following definition: “we define IS Habit as the extent to which people tend to perform behaviors (use IS) automatically because of learning” (p., 709). They explained that habit is acquired through the automatic behaviors, also called automatisms which refer to the fast and stimulus-driven tasks characterized by a lack of intention, attention and awareness (Salting and Phillips, 2007). Habit arises during prior usage and is an antecedent of IS continuance. Similarly, Hu and Kettinger (2008) have put forward the role of Habit as a moderating effect between Usage intention and the IS Continuance. Turel et al. (2011) have argued that habit is positively influenced by prior usage and perceived enjoyment, while it implies involvement and addiction to online auctions.

Recently, an increasing number of research studies are devoted to the role of habit in social media usage: Bohringer and Barnes (2011) have developed a model of Micro-blogging continuance of usage (Twitter case). They have adapted the PAM baseline model within which they have integrated habit and social exposure. Xu and Tan (2012) have emphasized the mediating role of SNS habit use in SNS addiction. The study we are presenting here is part of this research avenue and is aimed at enhancing the understanding of the SNS continued usage phenomenon and how it is related to habit and information overload.

## **2.3 Information Overload**

As reminded by Whelan and Teigland (2013) and Eppler and Mengis (2004), information overload is not exclusively related to IT development and use. During human history, knowledge acquisition and assimilation has always been considered as an endless task, and for some people a lifetime project. At a given point of time, a person engaged in such a task could potentially feel overwhelmed by all the information he or she needs to process. Nowadays, the terms ‘information overload’ are used to convey the simple notion of receiving too much information. And this phenomenon is tightly related to ICT use, and especially Internet, and their ceaseless production of huge amounts of data at decreasing costs (Schultze and Vandenbosch, 1998).

Within the research literature, Information Overload is related to many neighbouring constructs such as cognitive overload, sensory overload, communication overload, knowledge overload, and information fatigue syndrome. It has been addressed through various lenses: MIS, Human Resources (HR) and IS development Theory. It is also increasingly recognized as a major concern by researchers and practitioners because it potentially affects the information processing of individuals, groups, organizations and society (Grisé and Gallupe, 2000). The focus here is put on the linkage between the performance of the individual and the amount of information he or she is exposed to. “Researchers across various disciplines have found that the performance (i.e., the quality of decisions or reasoning in general) of an individual correlates positively with the amount of information he or she receives, up to a certain point. If further information is provided beyond this point, the performance of the individual will rapidly decline” (Eppler and Mengis, 2004). Similarly, Pennington and Tuttle (2007) argued that information overload is dependent upon two variables: the information-processing capacity; and the information-processing requirements; there is information overload when the second variable exceeds the first one. Research has also provided evidence that information overload decreases information use (Lusk, 1993). From a HR perspective, Oldroyd and Morris (2012) have demonstrated that top performing employees are willing to extensively develop their social capital through social networking (not necessarily mediated by information technology); And by doing so, they may cope with potential limitations of social capital due to structural challenges (Burt, 1997; Watts, 2004), such as limited control, over embeddedness and decreased expertise sharing; which are all related to information over-

load. Oldroyd and Morris (2012) put forward the role of HR practices in minimizing information overload in order to preserve the individual and organizational performance.

Hemp (2009) has reminded us that information overload has negative impacts on the US economy that are estimated to be 1 trillion dollars and described some of the solutions organizations may implement to handle this problem. Indeed, the software tools developed to mitigate work interruptions are part of the response but they are not sufficient to anchor new organizational practices which are less likely to infuse anxiety about IT usage.

Within SNS continuance research, information overload is not sufficiently addressed. It will be integrated with Habit in our PAM-based model.

### 3 CONCEPTUAL MODEL AND RESEARCH HYPOTHESES

We argue here that the combined effect of habit and information overload need to be theoretically and empirically addressed in the (continued) usage of SNS context. We have therefore developed a conceptual model (see figure 1) to fulfil this aim. Our model is basically anchored in the PAM because of its centrality is the IS Continuance literature, we have also drawn upon Limayem et al. (2003; 2007), Limayem and Hirt (2003); Limayem and Cheung (2005) works on Habit and IS continuance. Our hypotheses H10 and H11 are specifically related to the information overload impacts on SNS continuance. They have not been to our opinion tested in the previous MIS literature. The findings we are obtaining could therefore be considered as an original contribution of this research.

Hypothesis	Rationale
H1: Confirmation is positively associated with SNS perceived usefulness.	Our hypotheses H1 to H5 are faithful to the PAM model and have been adapted to the SNS continuance:  SNS continuance intention is determined by the satisfaction of SNS continued use and perceived usefulness of continued SNS use. User satisfaction, in turn, is influenced by confirmation of expectation from prior use and perceived usefulness. Perceived usefulness is influenced by SNS users' confirmation level.
H2: Perceived usefulness is positively associated with SNS satisfaction.	
H3: Confirmation is positively associated with SNS satisfaction.	
H4: Satisfaction is positively associated with SNS continuance intention.	
H5: Perceived usefulness is positively associated with SNS continuance intention.	
H6: Satisfaction is positively associated with habit.	Following Limayem et al. (2007), we posit satisfaction as an antecedent to habit
H7: Confirmation is positively associated with habit.	We propose also to test whether the other antecedents of IS continuance in the PAM model influence habit, this leads to our hypotheses H7 and H8.
H8: Perceived usefulness is positively associated with habit.	
H9: Habit is positively associated with SNS continuance intention.	In accordance with previous literature, we posit habit as an antecedent of SNS continuance intention (Jasperson et al., 2005; Limayem, et al., 2007; Barnes, 2011)
H10: Habit is positively associated with information overload	Finally, we propose to test whether habit could lead to information overload and if information overload positively affects the SNS continuance intention (H10 and H11).
H11: Information overload is positively associated with SNS continuance intention.	

Table 1. Research Hypotheses

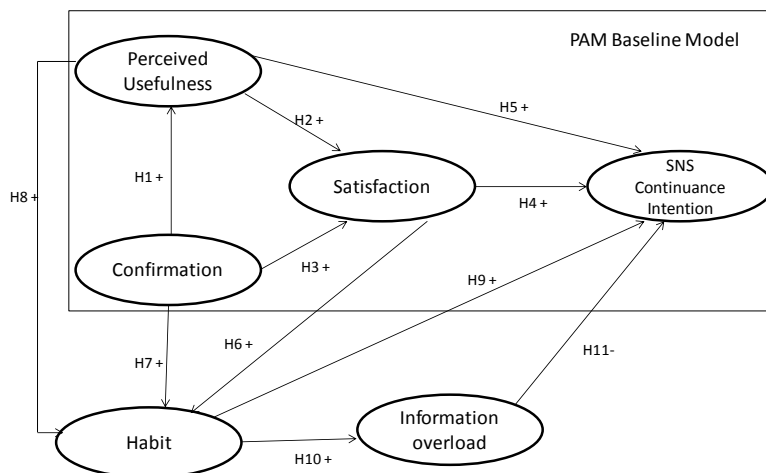


Figure 1. The Research Model.

## 4 RESEARCH STRATEGY

### 4.1 INSTRUMENT DEVELOPMENT AND SURVEY ADMINISTRATION

To operationalize our model, we have developed a survey instrument following Moore and Benbasat’s (1991) methodology. All our theoretical constructs have been operationalized by applying multi-item scales from previously validated measures. Minor modifications have been made to these scales in order to fit them to our study. The PAM baseline model constructs have been adapted from Bhattacharjee (2001); and also Davis (1989) for Perceived usefulness; Venkatesh (2000), Venkatesh et al. (2003) for Continuance IS intention. Habit has been operationalized using Limayem and Hirt (2003). And finally, Information overload has been operationalized by adapting Schultz and Vandenbosch (1998) and Isaac et al. (2007) scales. According to the literature, all our constructs are reflective (Jarvis et al., 2003). 10 academic researchers have pre-tested the instrument and have suggested a few minor modifications, which were made prior to full-scale administration through an online survey<sup>1</sup>. The questionnaire has been presented in French to a population of 6000 alumni of a Business school with a good reputation located in France. We have collected 320 questionnaires, all of them related to Facebook continuance intention. We have chosen to concentrate our analyses on this SNS to assure consistency of our data. The structure of our sample is presented in table 2.

Variables		Sample
Gender	Male	54,9%
	Female	45,1%
Age	[18,25[	7,5%
	[25, 35[	49,7%
	[35, 45[	32%
	[45, 55[	8,5%

<sup>1</sup> The questionnaire is available online at: <https://docs.google.com/forms/d/1mKvA5AY66XsLKnpUq3Ssgca08DpzAREZxxqCgYVAHw/viewform>

	[55, 65[	2%
	[65, +[	0,3%
Working as An executive Manager for	[0, 5 years [	32%
	[5, 10 years [	22,2%
	[10, 20 years	30,4%
	[	14,4%
	[20 years, + [	1%
	Retiree	

Table 2. Sample Characteristics

## 4.2 DATA ANALYSIS AND RESULTS

Our model is tested by Partial Least Squares (PLS) structural equation modeling using SmartPLS 2.0 (Ringle et al., 2005). PLS is appropriate for this type of study because it is able to model latent variables without requiring strict normal distributions of data (Fornell and Cha, 1994). It is also less constraining concerning small samples (Chin, 1998). A two-stage analytical procedure is followed: a confirmatory phase to assess the measurement model, then the structural model is examined. We first examine the PAM baseline model, then the whole research model. The two models have presented very satisfactory measurement criteria allowing us to examine our research hypotheses. However, due to space limitations, we present here only the detailed measurement analyses for the research model<sup>2</sup>.

### 4.2.1 Measurement Model

The measurement quality of our model is assessed through content validity, convergent validity and discriminant validity. The empirical and conceptual validation of our items provides good support to content validity. While convergent validity is assessed by examining for each construct the composite reliability (CR), the Cronbach's alpha, the average variance extracted (AVE) and the loadings of their respective items. Following Henseler et al. (2009), CR is preferred to Cronbach's alpha because it tends to underestimate the internal consistency of latent variables in PLS path models. Table 3 presents the required values for each of these indicators.

Measurement validity indicators		
CR : Composite Reliability	>0.7	Nunnally & Bernstein (1994)
AVE: Average Variance Extracted	>0.5	Fornell & Larker (1981)
Cronbach's alpha	>0.7	Nunnally & Bernstein (1994)
T-value	>1.96	Hensler et al. (2009)
Structural Validity indicators		
R squared of endogenous latent variables	>0.67 substantial >0.33 moderate >0.19 weak	Chin (1998)

Table 3. Required values for measurement and structural validity

Table 4 shows very satisfactory convergent specificities of our model.

<sup>2</sup> The comprehensive data analyses are available from the authors.

Construct	Item	Loading	t-value
<b>Perceived Usefulness (Reflective)</b>			
CR = 0,985251	PU1	0,991	332,456
Cronbach's a = 0,981153	PU2	0,939	27,587
	PU3	0,991	353,663
AVE = 0,989891	PU4	0,958	36,066
	PU5	0,942	31,984
<b>Confirmation (Reflective)</b>			
CR = 0,956935	CONF1	0,945	41,448
Cronbach's a = 0,932525	CONF2	0,936	36,164
	CONF3	0,935	34,169
AVE = 0,881054			
<b>Satisfaction (Reflective)</b>			
CR = 0,994920	SAT1	0,995	333,263
Cronbach's a = 0,989788	SAT2	0,995	351,193
AVE = 0,989891			
<b>Habit (Reflective)</b>			
CR = 0,981317	HABIT1	0,960	41,927
Cronbach's Alpha = 0,974577	HABIT2	0,973	52,945
	HABIT3	0,974	55,764
	HABIT4	0,948	32,404
AVE = 0,929241			
<b>Information overload (Reflective)</b>			
CR = 0,978403	INFOVER1	0,954	38,887
Cronbach's Alpha = 0,972318	INFOVER2	0,941	32,899
	INFOVER4	0,933	30,637
	INFOVER5	0,933	29,797
	INFOVER6	0,984	195,270
AVE = 0,900639			
<b>SNS Continuance intention (Reflective)</b>			
CR = 0,972470	SNSCONT1	0,972	63,998
Cronbach's a = 0,943390	SNSCONT2	0,974	72,425
AVE = 0,946416			

Table 4. Convergent Validity Measurements

Discriminant validity is assessed by examining whether the square root of the AVE for each construct is higher than the correlations between it and the other constructs, as recommended by Fornell and Larcker (1981). Table 5 shows that this condition is supported. Following Chin (1998), we also proceed to a cross-loading analysis (table 6) and notice that each construct shares larger variance with its own measures than with other measures. The discriminant validity of our model is verified.

	Confirmation	Habit	INFOVER	SNS Cont	PU	SAT
Confirmation	<b>0,93864</b>					
Habit	0,9504	<b>0,96397</b>				
Inf Overload	0,9343	0,9264	<b>0,94902</b>			
SNS cont	0,8838	0,9285	0,8750	<b>0,97284</b>		
PU	0,9511	0,9179	0,9562	0,9149	<b>0,96457</b>	
SAT	0,0712	0,0817	0,0772	0,0266	0,0771	<b>0,99493</b>

Table 5. Correlations between constructs (diagonal elements are Square Roots of the AVE)

	CONF	HABIT	INFOVER	SNSCONT	PU	SAT
CONF1	0,945328	0,932423	0,885304	0,860819	0,936064	0,069528
CONF2	0,935521	0,876403	0,873213	0,825968	0,870056	0,064360
HABIT1	0,922128	0,960347	0,887637	0,943766	0,935585	0,039866
HABIT2	0,929074	0,973166	0,909896	0,883829	0,961433	0,086261
HABIT3	0,930350	0,974393	0,911631	0,885781	0,961706	0,087876
HABIT4	0,881829	0,947736	0,861941	0,865673	0,911225	0,102330
INFOVER1	0,939670	0,932842	0,953518	0,861188	0,936549	0,061495
INFOVER2	0,868838	0,863087	0,940743	0,796223	0,878229	0,083001
INFOVER3	0,838614	0,830590	0,932758	0,816168	0,866397	0,078963
INFOVER4	0,839788	0,831429	0,932843	0,815063	0,856025	0,052439
INFOVER5	0,939551	0,930809	0,984259	0,860451	0,947456	0,090190
SNSCONT1	0,851866	0,889203	0,850352	0,972175	0,890741	0,011884
SNSCONT2	0,867550	0,917000	0,852154	0,973503	0,890741	0,011884
PU1	0,960356	0,986420	0,939572	0,911869	0,990839	0,083723
PU2	0,877193	0,900874	0,922838	0,884991	0,938778	0,060143
PU3	0,959603	0,985820	0,938674	0,912627	0,991403	0,078039
PU4	0,904844	0,932397	0,896368	0,861228	0,958124	0,098780
PU5	0,881311	0,907024	0,864478	0,839773	0,942365	0,049529
SAT1	0,070017	0,080966	0,076147	0,025845	0,075728	0,994843
SAT2	0,071636	0,081649	0,077499	0,027009	0,077601	0,995022

Table 6. Correlations between Items and Latent Variables

#### 4.2.2 Structural Model

Since we obtained satisfactory psychometric characteristics of our model, we can now estimate the structural model. We conduct a Bootstrapping analysis for the baseline model, then for the research model. We analyze the strengths and directions of the relationships among the variables (we assess the beta, T-statistics and p-value of each path). Then we examine the R squared of the dependent variables. A summary of hypotheses’ testing is presented in tables 7 and 8.

Hypotheses	Path description	Standardized beta	T-Statistics	Supported	R 2
H1	CONF → PU	0,951***	59,675	YES	0,905
H2	PU → SAT	0,098	0,513	NO	0,06
H3	CONF → SAT	0,022	0,114	NO	
H4	SAT → SNSCONT	0,022	0,433	NO	0,839
H5	PU → SNSCONT	0,918***	23,042	YES	

\* : p < 0.05 ; \*\* : p < 0.01 ; \*\*\* : p < 0.001

Table 7. Baseline Model Results

Hypotheses	Path description	Standardized beta	T-Statistics	Supported	R 2
H1	CONF → PU	0,951***	61,103	YES	0,905
H2	PU → SAT	0,098	0,521	NO	0,06
H3	CONF → SAT	0,022	0,115	NO	
H4	SAT → SNSCONT	0,050	2,521	VERY WEAK	0,866
H5	PU → SNSCONT	0,079	0,232	NO	
H9	HABIT → SNSCONT	0,778**	2,052	YES	



H11	INFOVER SNSCONT	→	0,083	0,447	NO	
H6	SAT→ HABIT		0,007	0,687	NO	0,961
H7	CONF→ HABIT		0,212**	2,256	YES	
H8	PU→ HABIT		0,776***	8,331	YES	
H10	HABIT→ INFOVER		0,926	26,697	YES	0,858

Table 8. Research Model Results

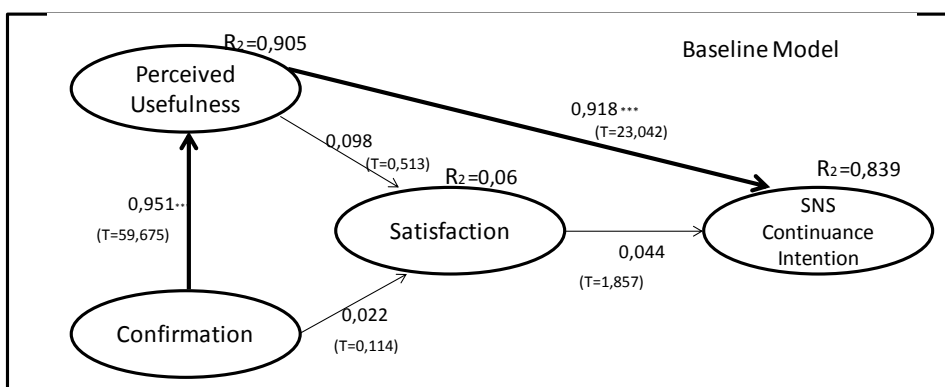


Figure 2. The Baseline Model Results

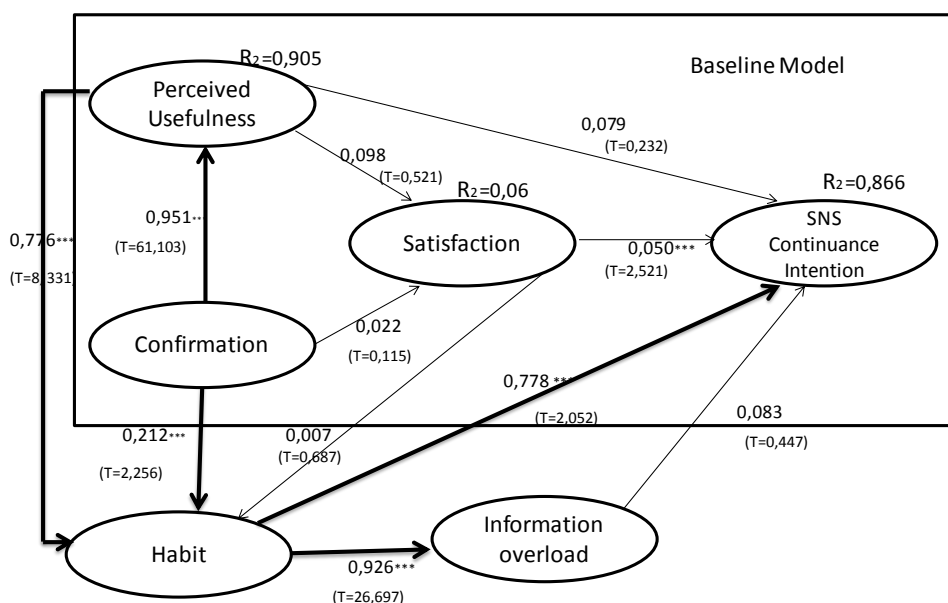


Figure 3. The Research Model Results

As determined in tables 7 and 8 and illustrated in figures 2 and 3, we obtain a high explanatory power of SNS continuance intention. The baseline model explains the variance of SNS continuance intention (measured by the R2 related to this construct), at 83,9 % , which is considered as substantial (Chin, 1998). In our research model this variance is improved (R2 = 86,6%). This finding provides evidence that habit and information overload are relevant explaining factors of SNS continuance intention. In the baseline model, confirmation strongly determines perceived usefulness which is positively and strongly related to SNS continuance intention. Satisfaction does not seem to play any significant role.

## 5 DISCUSSION AND CONCLUSION

In our research model, incorporating habit and information overload seems to modify the equilibrium between the PAM constructs. SNS continuance intention is not determined by any of its (PAM-) antecedent variables, namely satisfaction and perceived usefulness. Only habit appears to be an explaining factor of SNS continuance intention. Whereas habit is strongly determined by perceived usefulness, it is less saliently determined by confirmation. The intuitive proposition according to which information overload will positively affect SNS continuance intention has not been supported. It seems nevertheless positively and strongly determined by habit.

This study is subject to sampling error which is common to sample surveys (Braverman, 1996). Another limit concerns the operationalization of our variables which does not sufficiently take into consideration the dynamic and temporal nature of the process of continuance usage (Bhattacharjee and Premkumar, 2004; Kim and Malhotra, 2005). We need also to profoundly explore the linkage between habit and information overload within other research fields like social psychology.

An important contribution of our work is the development of an instrument that was tested for validity and reliability through the process of this research. Our findings suggest that in the context of SNS continued usage, habit acquired through the automatism that arise during prior usage, while potentially leading to information overload, seem to be the more salient antecedent of SNS continuance intention. People do not ask themselves if they are really satisfied by the SNS they are experiencing to decide or not to continue using them. Moreover, even though they feel themselves overwhelmed by information, this will not interfere in their intention to continue using SNS.

A potential future research avenue may concern the effect of habit on SNS usage efficiency, for example, if we relate habit to user engagement (Claussen et al., 2013). From another perspective, our results may raise a new variable we are not addressing in this study: Addiction (Yang and Tung, 2007; Turel et al., 2011). Do Habit, information overload and addiction contribute to forge the dark side of the post-adoptive behaviour of the SNS user? More research is needed to answer this question using for example in-depth qualitative studies. Habit is part of our everyday behaviour (Duhigg, 2014). As IT users, we could carry on some automatism which may not be beneficial for the organization. So, from a managerial perspective, it would be important to raise the issue of how to change the 'bad' habits which may install within an organizational setting?

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