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Do you Get Tired of Shopping Online? Exploring the Influence of Information Overload on Subjective States towards Purchase Decision¹

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Abstract: The increase and development of shopping websites make customers confront with too much information, this may influence subjective states towards purchase decision. The main purpose of this study is to investigate the influence of information overload on subjective states towards purchase decision. Based on the framework of stressor-strain-outcome, we regard information overload as the antecedent of website fatigue and website anxiety, which could further influence subjective states towards purchase decision. Besides, customer involvement should be considered. The results show that information overload leads to the low level of subjective states towards purchase decision through website fatigue and website anxiety and customer involvement plays as a moderator. Implications and limitations are also raised.

Keywords: Information overload; Website fatigue; Website anxiety; Customer Involvement; Subjective states towards purchase decision

1. INTRODUCTION

The development and penetration of the Internet accompany increasing number of shopping websites. Information on the websites includes product information provided by suppliers, online reviews and so on. It is evident that the amount of information beyond customer processing ability may lead to information overload^{[1][2]}. There exists a large amount of products and services, differences among websites, all problems may lead to customer negative emotions such as fatigue, anxiety and influence subjective states towards purchase decision. We can see from this phenomenon that larger amount of information is not always better for customers, on the contrary, customers may make improper decisions^{[3][4]}.

It is demonstrated that when the information increases beyond a threshold, customers are vulnerable to show website fatigue and website anxiety^{[5][6]}, they might need to take more effort to deal with information and make improper decisions^{[7][8]}. The subjective states towards purchase decision will influence the customer's future attitude towards the website, and they are explicit indicators of the website future performance.

There is also another factor that influences customer emotions of the information provided, i.e., customer involvement. Customer involvement reflects the extent that customers spend time selecting, comparing and making decisions on the shopping websites. High customer involvement indicates that the relationship between the website and customer is intimate so online customer has high expectations about the information provided so if problems such as information overload occurs, customer may feel more website fatigue and anxiety. That's to say, customer involvement may act as a moderator. Previous literatures lack the study of information overload on subjective states towards purchase decision, they always investigate the motivations which could elevate customer positive subjective states^{[9][10]} and extant little research studies people internal states from the perception and external proxies^{[11][12]}, however some conclude with contradictory results on whether much information is good for customers^{[3][8][13]}. This paper investigates the relationship between information overload and subjective states towards purchase decision, taking the role of website fatigue and website anxiety into

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consideration. Furthermore, the moderating role of customer involvement is also checked.

The paper is organized as follows. In Section 2, we clear up the theoretical background and conduct a literature review, research model and hypotheses of the study are also raised. In Section 3, we describe the research methodology including measurement, data collection and data analysis. Section 4 includes discussion and interpretation of the results, and finally we summarize the conclusions in Section 5, some theoretical and practical implications, limitations and future studies are raised in Section 6.

2. THEORETICAL BACKGROUND AND HYPOTHESE

In this section a research model is developed to study the role of information overload in affecting subjective states towards purchase decision. We adopt the stressor-strain-outcome framework^[14]. It is a model investigating how people's pessimistic behavior is developed from the dark sides of stressor and strain perspectives, which is adequately suitable in our research to learn the decrease of subjective states towards purchase decision. It follows the routine that stressor leads to customers' strain and further produce negative outcomes. Stressor refers to information overload, strains refer to website fatigue and website anxiety and outcomes refer to subjective states towards purchase decision. The research model is shown in Figure 1.

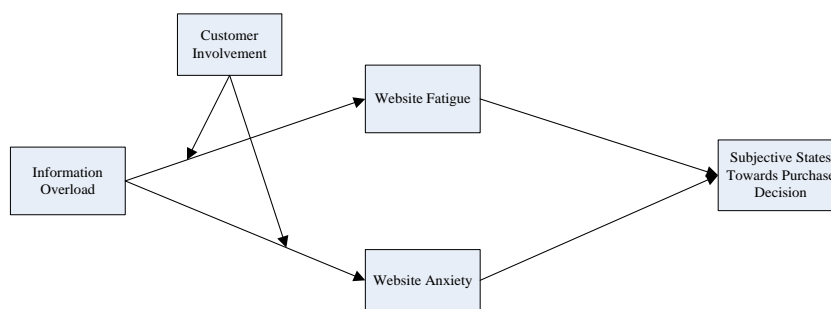


Figure 1. Research model

2.1 Information overload and website fatigue, website anxiety

From a subjective perspective, overload refers to the individual's subjective perception and evaluation of the amount of things or people that exceed ability to handle^[15]. Some researchers defined information overload as the large amount of information generated on the website which exceed one's ability to process^[7].

Fatigue is described as a subjective and unpleasant feeling of tiredness that has multiple dimensions varying in duration, unpleasant and intensity^[16]; it can be divided into physical^[17] and psychology fatigue^{[16][18-21]}. Psychology fatigue can be defined as a negative perception such as tiredness, disappointment, loss of interest, or reduced need and motivation associated with website use and interactions^[6]. Based on the definition of social network fatigue^{[6][22][23]}, we define website fatigue as a negative emotional reactions to shopping website activities. Meanwhile, the intrinsic characteristic of website^[24], risk of using the website^[25], leak of customer's privacy^[26] and time delay of website^[27] make the shopping complex and diversity, it can easily induce customers' mental state of angry, annoyance and anxiety. Website anxiety reflects customer fear about using the website^{[26][28]}. To some extent, the constructs of website fatigue and website anxiety are similar, however, they reflect different aspects of the negative emotions. Website fatigue just demonstrates the feeling of tired, stressful but it is slight and not related to the angry and anxious perceptions as website anxiety shows. Fatigue is less serious than website anxiety, it is a stressful condition but can be lessened if dealt with properly, however more is needed to do if the merchants want to diminish website anxiety and usually the website anxiety is difficult and even cannot be repaired in the online environment.

Information overload has non-negligible effect on customers' perceptions. Information overload is the

antecedent which could influence social network fatigue^{[2][6]}, the relationship between information overload and social network fatigue is significantly positive^[23]. Information overload may also lead to information anxiety, including psychological or emotional anxiety and helplessness^[29]. Information anxiety is raised to describe peoples' mental anguish when confronting excessive information^[30]. Trust of technology has an effect on customer internet anxiety^[26]. In conclusion, customers face with explode information with the development of shopping websites, this is voluntarily induce website fatigue and website anxiety. We hypothesize as follows:

H1: Information overload has effect on website fatigue.

H2: Information overload has effect on website anxiety.

2.2 Website fatigue, anxiety and subjective states towards purchase decision

In the context of online shopping, customers confront many decisions. Subjective states towards purchase decision indicate customer's feelings and perceptions of the decisions they make. It is an immediate and strong predictor of website future performance. Enhancing customer subjective states towards purchase decision is one of the most important aims of e-commerce websites. An increasing body of IS researches has recognized the importance of subjective states towards purchase decision in online context^{[4][8]}. Customers may decrease their shopping frequency due to the negative experience from previous shopping. According to some researches, when individuals are stressed, they have a tendency to take some strategies to alleviate the unpleasant feelings^{[31][32]}. Zhang et.al^[1] confirmed that social network fatigue can lead to discontinuous usage behavior. The study of Bartlett^[33] indicated that fatigue could impact on customer discontinuous activities. Ma et.al^[34] demonstrated that fatigue influences continuous performance negatively. Website anxiety could influence users' self-efficacy^[25]. These studies all showed that in online shopping environment, when customers have negative perceptions such as website fatigue and website anxiety, they are likely to show low perceptions. Thus, it may lead to their low level of subjective states towards purchase decision. We hypothesize as follows:

H3: Website fatigue has an effect on subjective states towards purchase decision.

H4: Website anxiety has an effect on subjective states towards purchase decision.

2.3 Customer involvement

Customer involvement demonstrates that customer establish some degree of correlations with the website. Researchers define service customer involvement as a central factor in service development, a set of inputs and efforts engaged in service idea generation, design and configuration as well as the total process of delivery^[35]. We continue this definition in our research. Type of knowledge and characteristics of task can affect customer involvement^[36]. Involvement resulted from the interactions between the person, stimulus and situation, it relates to preferences and connections that customer make between her or him and the website^[37]. The literature suggested that the more customers involve, the more likely they put more effort to the purchase, consumption and evaluation process^[38]. The customer involvement can moderate the relationship between knowledge-centric service supply and technical value^[35]. We assume that information overload would lead to website fatigue and website anxiety. Besides, if customer involvement is high, the relationships between information overload and website fatigue as well as between information overload and website anxiety may be more significant compared to low customer involvement. Customers have high possibilities to notice overload so it may contribute much to website fatigue and website anxiety compared to low customer involvement. We hypothesize as follows:

H5: Customer involvement moderates the relationship between information overload and website fatigue positively.

H6: Customer involvement moderates the relationship between information overload and website anxiety positively.

3. METHODOLOGY

A questionnaire is developed to empirically test the research model. The measurement items are developed based on prior literatures in marketing and service area. The measurement items are modified to adapt to the online shopping context. Information overload is measured by 4 items based on the work of Zhang et.al^[1] and adapted for use in the context of online shopping where required. Website fatigue is measured by 6 items from prior literatures^{[1][34][39]}. The construct of website anxiety is measured based on the framework of prior researches^{[5][40]} and customer involvement is adapted from Zaichkowsky^[41]. Subjective states towards purchase decision are measured based on the prior work of Chen et.al^[8] and it is measured from the opposite aspects.

As the original items are in English, a back-translation method is used to convert these items into Chinese. We discuss the measurement items within our research team to guarantee the content validity, readability and design quality of the questionnaire. The measurement items are modified according to their suggestions and feedbacks. To ensure the reliability and validity of the scale, we selected 47 undergraduate students in a university to conduct a pilot test. These students have online shopping experience. The results show that the measurement items are adequate to implement further. The questionnaires are distributed to 300 people, after eliminating incomplete responses, 234 valid survey responses are remained for further data analysis.

4. RESULTS

4.1 Measurement model

First of all, we check the validity of the structural model using KMO and Bartlett's sphere test. According to the suggestions of prior literature^[42], the value of KMO should be above 0.6 and the Bartlett's sphere test should be significant. In a well-designed model, the proportion of cumulative explanatory variables for factors must reach 50%. The result shown in **Table 1** indicates the model is adequate.

Table1. KMO and Bartlett's sphere test

Measurement items	KMO	Bartlett's sphere test		Cumulative variances explained
Information Overload	0.845	χ^2	534.582	75.958
		df	6	
		Sig.	0.000	
Website Fatigue	0.882	χ^2	977.447	71.373
		df	15	
		Sig.	0.000	
Website Anxiety	0.862	χ^2	705.071	71.586
		df	10	
		Sig.	0.000	
Customer Involvement	0.914	χ^2	972.747	72.358
		df	15	
		sig	0.000	
Subjective States towards Purchase Decision	0.788	χ^2	343.929	66.104
		df	6	
		Sig.	0.000	

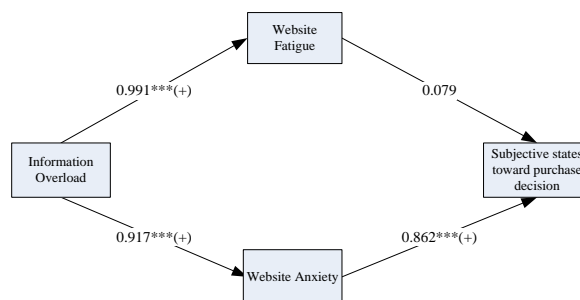
The analysis employed structural equation model to test shown in **Table 2**. The reliability is checked by Cronbach's α , composite reliability (CR) and average variance extraction (AVE). And validity used factor loadings, composite reliability (CR) and average variance extraction (AVE) for check. First, the factor loadings of all constructs must be above the standard value of 0.5. Second, the research tests CR and the results are greater than the recommended value of 0.7^[43]. The measurement of Cronbach's α is above the suggested value of 0.7. Lastly test of AVE indicates the value is above the suggested.

Table 2. Reliability and validity of the measurement model

	Measurement Item	Factor Loading	Cronbach's α	CR	AVE
Information Overload	I1	0.812	0.894	0.881	0.650
	I2	0.815			
	I3	0.808			
	I4	0.790			
Website Fatigue	F1	0.840	0.919	0.919	0.655
	F2	0.814			
	F3	0.87			
	F4	0.851			
	F5	0.723			
	F6	0.744			
Website Anxiety	A1	0.877	0.900	0.898	0.639
	A2	0.797			
	A3	0.734			
	A4	0.756			
	A5	0.826			
Customer Involvement	C1	0.864	0.923	0.928	0.683
	C2	0.854			
	C3	0.847			
	C4	0.786			
	C5	0.857			
	C6	0.893			
Subjective states towards purchase decision	S1	0.683	0.828	0.797	0.500
	S2	0.664			
	S3	0.82			
	S4	0.642			

4.2 Structural model

The structural model is verified for path analysis and model fit. The results shown in **Figure 2** indicating that information overload influences website fatigue and website anxiety positively. In addition, the impact of website anxiety on subjective states toward purchase decision (measured from the opposite aspect) is significant. However, the influence of website fatigue on subjective states towards purchase decision is not



* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

$\chi^2 = 349.327, df = 145, \chi^2/df = 2.409, p = 0.000, GFI = 0.855, AGFI = 0.810, RMSEA = 0.078$

Figure 2. Fit of structural model

verified, thus H3 is not supported. The path coefficients and significances are labeled in **Figure 2**. These support Hypothesis 1, 2 and 4. We also test the overall fit of the model, the summary of the overall fit indices of the research model is also shown in **Figure 2**. The p-value is significant and GFI, AGFI are all exceed the recommended value of 0.8, RMSEA is no more than 0.08. Other indices are also accord with the recommendations, which indicate that the research model has a good fitness.

4.3 The moderating role of customer involvement

Using multiple hierarchical regression method, we examine the moderating role of customer involvement. As is shown in **Table 3**, H5 is not supported. The results indicate that customer involvement does not moderate the relationship between information overload and website fatigue, which is not accord with our hypothesis, and the reasons are discussed in the conclusion.

Table 3. The moderating role of customer involvement between information overload and website fatigue

		Model 1		Model 2		Model 3	
		β	T value	β	T value	β	T value
Main Effect	IO	0.871	26.978	0.864	27.182	0.850	26.046
	CI			-0.100	-3.147	-0.102	-3.219
Moderating Effect	IO \times CI					0.058	-1.792
Adjusted R Square		0.758		0.767		0.769	
R Square Change		0.759		0.01		0.003	
F Change		727.788***		9.902***		3.212	

The moderating role of customer involvement in the relationship between information overload and website anxiety is shown in **Table 4**. Accordance with our hypothesis, customer involvement moderates the relationship between information overload and website anxiety positively. Thus, H6 is supported.

Table 4. The moderating role of customer involvement between information overload and website anxiety

		Model 1		Model 2		Model 3	
		β	T value	β	T value	β	T value
Main Effect	IO	0.771	18.421	0.765	18.334	0.740	17.370
	CI			-0.08	-1.926	-0.084	2.027
Moderating Effect	IO \times CI					0.105	2.477.
Adjusted R Square		0.593		0.598		0.607	
R Square Change		0.595		0.006		0.010	
F Change		339.341***		3.708		6.135**	

5. CONCLUSION

This paper studies how information overload on shopping websites induces customers' feelings of strain in terms of website fatigue and website anxiety, and how it further influences customers' subjective states towards purchase decision. Besides, the moderating role of customer involvement is also taken into consideration.

The results manifest that information overload influences website fatigue and website anxiety. Information overload is the antecedent of customer emotional exhaustion, tiredness and has a tendency to lead to website fatigue. What's more, when the website cannot provide customers with excellent experience and if risky in the

context of information overload, it can easily lead to more serious reactions such as website anxiety.

The results show website fatigue cannot lead to subjective states towards purchase decision, the possible reason is that this kind of pessimistic emotion indicates customer has no energy and enthusiasm in the shopping process, however, it just demonstrates the customer is tired and not necessarily leading to low level of subjective states towards purchase decision. What's more, the relationship between website anxiety and subjective states towards purchase decision is verified, demonstrating that when customers are anxious and worry, their website anxiety makes them value less on their decision and influences their subjective states towards purchase decision. Thus, website fatigue and website anxiety are different emotions and anxiety is more serious than fatigue, which need website providers to treat differently in the context of information overload.

Customer involvement acts as a moderator in the relationship between information overload and website anxiety. It is shown that when customer involvement is low, the relationship between information overload and website anxiety is less significant. Customer involvement indicates the extent customer engaging, it demonstrates the perception of customer. High customer involvement manifests the customer accepts the website. However, if information overload exists, it is likely to lead to significant increase of website anxiety. Besides, the moderating role of customer involvement in the relationship between information overload and website fatigue is not supported. The possible reason may be that website fatigue is inevitable in the context of information overload, no matter high or low customer involvement is not enough to change the phenomenon.

6. IMPLICATIONS AND LIMITATIONS

6.1 Implications

This research has some theoretical contributions. First, instead of focusing on the positive side of shopping websites, our study extends the researches on the negative aspects, which has mostly been ignored^{[44][45]}. It complements previous studies that overvalue the positive aspects of shopping online and contributes to more comprehensive understanding of the dark sides of the shopping websites^{[46][47]}.

Second, we also contribute to the understanding of subjective states towards purchase decision and the negative factors inducing low level of subjective states. We considered different manifestations such as customer satisfaction and customer's evaluation. It complements previous studies that only focus on one indicator of customer subjective states^{[48][49]}. We find that subjective states towards purchase decision are not only determined by positive but also influenced by the negative aspects such as website anxiety.

Third, we manifest that customer involvement is a prominent moderator in the relationship between information overload and website anxiety, and websites nowadays provide adequate functions in order to establish intimate relationships with their customers. However, the empirical results show that high level of customer involvement does not always help to lessen website anxiety. Thus, customer involvement should be treated more comprehensively by shopping websites to avoid the negative effects of information overload.

The results of our research also have some practical implications for website providers. Firstly, our study proposes a stress-strain-outcomes framework. No matter how attractive the websites are, they will have to confront with much information. Personalizing the way presented and balancing the simplification and abundance of information to postpone website fatigue and website anxiety is important for the website.

Secondly, customer negative emotion such as website anxiety is of vital importance to subjective states towards purchase decision. Providers should take efficient tactics to decrease anxiety, provide some material awards in order to increase the enthusiasm of their customers and avoid the negative feeling of website anxiety.

Finally, customer involvement is a non-neglectable variable in the online shopping environment. Customer may have negative emotions towards information overload, and empirical results show that the higher customer involvement is, information overload influences website anxiety more significantly. Thus, the website providers

should exert effort to create a comfortable environment for customers. For customers who are highly involving in the website, the website should provide more precise information to lessen overload. Only when customer perceive the shopping website is valuable, they have motivations to participate. What's more, the shopping website can have enough assets to create a more pleasing environment thus this process forms a virtuous cycle.

6.2 Limitations

The results of this study should be interpreted in the light of limitations. First, though subjective states towards purchase decision can be regarded as predictor of future purchase behavior, in-depth investigation is needed to conduct considering their internal mechanisms. Second, more studies need to be conducted on stimulus of website fatigue and website anxiety, future studies can take them into consideration. In the long run, whether there is a pattern in the occurrence of website fatigue, anxiety and the motivators of customers shopping online in the context of information overload are questions that provide potential directions for future research.

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