Different Influences of Perceived Interactivity of E-Commerce Sites on Consumers—Based on Self-Constructed Regulation Mechanisms

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Abstract. Based on the improved traditional multi-group structural equation model, this paper makes use of the measurement consistency and structure consistency to discuss the performances difference of the perceptive interaction influences on interdependent-self consumers and independent-self consumers of ecommerce websites in base-line models. The results show that interdependent-self consumers are more perceptual in the baseline model, while independent-self consumers are more rational.

1. Introduction

With the deep development of the internet, how to build a website to meet different needs and personalized consumers has become an important aspect of network marketing. Due to the perceived interactivity is a unique advantage of the internet [1], many scholars discussed the influence of perceived interactivity of the site on consumer's behaviours and emotional reactions. Moreover, there has been a preliminary framework of the dimensions, pre-factors and effects of the perceived interactivity. However, as the perceived interactivity of the website is co-influenced by the website factors and situational factors at the consumer level, there is a lack of research bringing the consumer factors as moderators into the perceived interaction system.

This paper will introduce self-construction as a moderating factor at the consumer level, and discuss the different performances between different self-constructed consumer groups under the perceptual interaction baseline model.

The analysis of traditional multi group structural equation model (SEM) often makes use of the path coefficient to discuss the differences among the factors of multiple groups. As the scale may not have the measurement equivalents, this method is lack of a certain rigor [3]. Therefore, this paper improves analysis method of the traditional multi group structural equation model to discuss the different performances among different self-constructed consumer groups through measurement consistency test and structural consistency check under the baseline models.

2. Theory Basis and Literature Review

2.1. Perceived interactivity

Interaction generally refers to the interrelationship between objects or among the objects more than two, while the corresponding interactivity is used to describe the positive effect produced by the whole process of interaction [4]. From the middle of 1990s when Newhagen put forward the concept of the

perceived interactivity, interactivity began to be introduced into the perceived categories of the internet consumption as a kind of mental state [5].

Based on different types of web media, there are certain dimensional differences of the network perception interactivity. In view of the computer and the e-commerce network advertising, both Newhagen [5] and Wu Guohua [6] put forward the two dimensional view of perception interactivity—the internal utility and external utility. The internal utility refers to the interactive ability of consumers in the process of shopping for information exchange, and the external utility refers to the recognitive ability of the e-commerce company as a marketer for consumers' feedback information. Then, the scholars of various countries have supplemented the two-dimensional theory by quantitative analysis. Mcmillan [7] divided the interactivity dimensions into three aspects, which are bidirectionality, no-time-delay and attractiveness.

Bidirectionality refers to the interaction and communication between websites and consumers. No-time-delay refers to the speed of information communication, and attractiveness refers to the involvement degree of consumers in the process of buying products and services. The study of Liu Yuping [8] stated that the perceived interactivity of network could be divided into the characteristics of control, bidirectionality and simultaneity. Wu Guohua [6] proposed a three-dimensional theory of control, responsiveness, and personalization.

Because of the relationship established in the process of consumer's shopping, some scholars put forward the fourth dimension [9]. However, for social mobile websites, consumers also focus on the perception of entertainment. From the perspective of the universal application of all online advertisements, Johnson divides the perceived interactivity in the process of online consumption into four dimensions: responsiveness, reciprocity, response speed, and nonverbal information [11]. Responsiveness refers to the degree of information feedback; reciprocity refers to the degree of consumers' participation and communication; response speed refers to the timeliness of the information response; nonverbal information refers to the sum of communication channels. However, the data showed that reciprocity was not significantly related to perceived interactivity in Johnson's empirical analysis.

In recent years, some scholars proposed that there was a significant correlation between the four-dimensions and the network perception interactivity [12]. According to the above study, the paper selects the four dimensions of perceived interactivity proposed by Johnson to explore the self-constructed regulation mechanism of perceived interactivity in the baseline model.

2.2. Perceived value
Zeithaml[13] formally put forward the concept of perceived value in 1988. It was a subjective evaluationt after balancing the product's costs and effects when the consumers obtain the product. Then, Monroe and Gale[14] that the customer's perceived value was equal to customer's net income in the process of consumption; while Butz[15] introduced the emotional factor into the concept of the perceived value of the customer. Holbrook [16] believed that the perceived interactivity process is influenced by the individual preference in a certain extent, and the consumers will have the perceived value difference due to the personal preference. Gronroons [17] and Woodruff [18] proposed that the perceived interactivity was influenced by the product value and other elements. Then, Anderson [19] introduced the favourable balance of the product value and product cost into the theory of perception interactivity. He pointed out that the difference between the customer's satisfaction with the product and the time and energy spent on the product was the perceived value. Flint[20] established the overall value concept in perceived interacitivy and compared the perceived interacitivy from the aspects of value sense, ideal value and value judgement.

Perceived value can be divided into multiple dimensions. Zeithaml[13] suggests that perceived value includes product value and cost value. The product value, as a consumer's assessment of the benefit of the product and service, determines the consumer's willingness to pay. Cost value refers to the time and energy that the consumer pays in the process of buying.

Davis[21] also put forward the information value on the basis of the Zeithaml's dimensions. From a logical point of view, the value of information was defined as a degree to improve the efficiency of customer's consumption. Sheth, Newman and Gross[22] divided the process of consumer purchase behavior into five categories, which are functional value, social value, emotional value, knowledge value and situational value. Functional value refers to the perception of the information in the process of buying goods; social value refers to the cognition of the society for the product; emotional value refers to the consumer's preference for the product; knowledge value refers to the consumer's knowledge and satisfaction from the product and the purchase process; situational value refers to the product perception differences of the consumer under different time conditions. Babin, B. J. et al. introduced the pleasure value into the perceived value dimension,which showed that the pleasure value is the objective criterion of the entertainment experience in the process of consumer shopping. Parasuraman and Grewal divided the perceived interactivity into the acquisition value, transaction value, use value, repayment value and so on. According to the research result of Jin Liyin, the social value was also a dimension of perceived interactivity in the aspect of virtual brand community. That is to say, consumers intercommunicate information and emotional appeals through the network communication patterns built by the product.

Based on the above views, this paper will select four dimensions of the perceived value, namely, product value, information value, pleasure value and social value [26], to study different behaviors of different self-constructed consumers in shopping website.

3. Research Model and Hypothesis

3.1. Proposal of baseline model
In the process of consumption, consumers perceive the interactivity process based on the factors such as network, advertising and so on. Through the four dimensions of reciprocity, responsiveness, response speed and non-verbal information, the perceived interactivity directly and positively affects consumer's emotion and behaviour [6, 27]. In addition, the perceived interactivity process will play a promoting effect on the perceived value to a certain extent, and take the perceived value as part of the intermediary role factors to indirectly lead to consumers' emotion and behaviour; simultaneously, the perceived interactivity can also trigger the perceived value, emotional reaction and behaviour reaction in turn [28].

Consumer behaviour is also influenced by consumer's emotion to some extent. On the other hand, the emotion can also affect behaviour as a mediator of perceived interaction.

Thus, this paper puts forward the following hypothesis:

H1: The baseline model of the perceived interactivity mechanism is correct. (Figure 1)
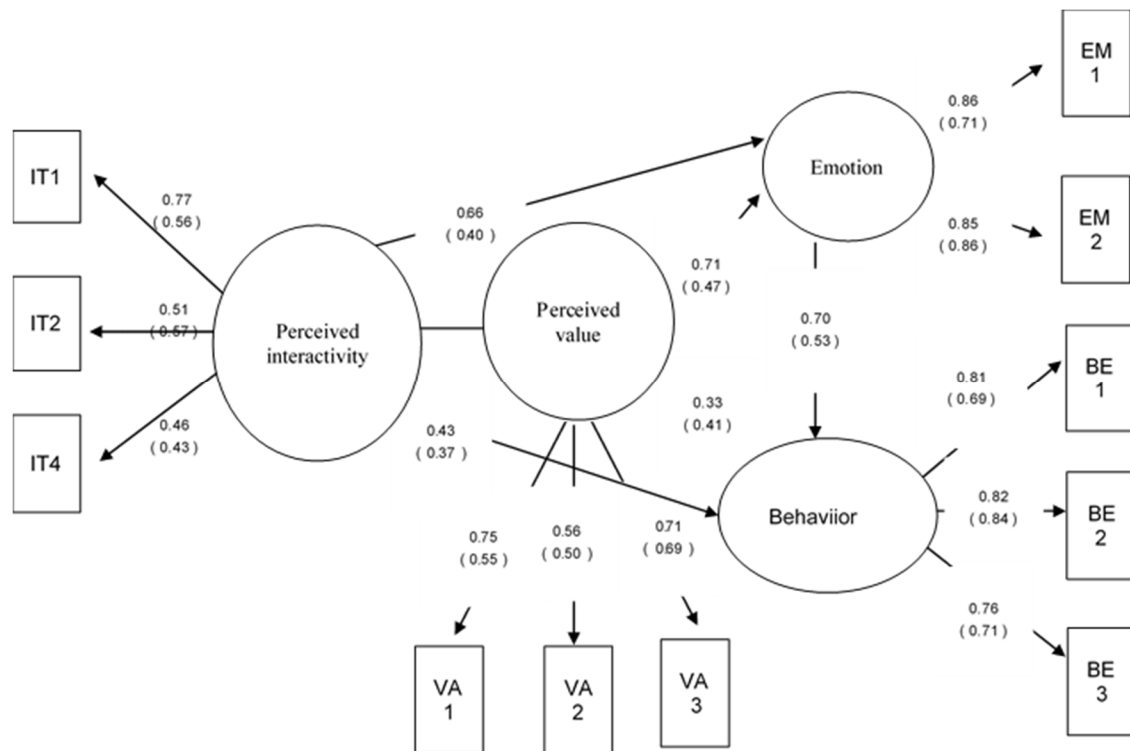
Figure 1. Perceived Interactivity Model of Influence Factors of Independent Self-Construal and Interdependent Self-Construal

3.2. Self-Constructed Regulation Mechanisms of the Baseline Model
Self-construction is the perception difference of the relationship with others in the process of the formation of different individual values [29]. Self-construction can be roughly divided into independent personality and interdependent personality [30]. Independent personality is an inherent and stable trait that emphasizes self-expression. It is also independent of the environment. On the contrary, the interdependent personality emphasizes the degree of social participation, which is easily affected by the influence of the environment and other people [31]. The two personalities are mutually antagonistic, but also a contradiction interdependent way. The two kinds of traits drive consumers to have different tendencies in emotions and behaviours.

Mao Zhenfu studies showed the difference between independent personality and interdependent personality. The independent personality tends to self-expression and independence, emphasizing the independent decision-making. And independent personality tends to the nostalgia and social intercourse. The consumer with the independent personality will make a comprehensive analysis of past experience, environment and others' views to make a decision [32]. Combined with the four degree classification of perceived interactivity dimensions, the independent personality always focuses on results in the decision-making process and has great expectations for the decision-making efficiency. The independent personality tries to save time and cost, and its decision-making process is more dependent on the responsiveness and response speed of the perceived interactivity. The interdependent personality hopes to maintain the current social relations and social status, meeting their nostalgia and reaching an empirical judgment. Therefore, the consumer with the interdependent personality is keen to collect diversified information, and pay attention to the interactive participation of the product and the whole. Based on this, interdependent personality has higher expectations for mutual benefit and non-language information of perceived interactivity.

Due to the trust of the independent personality and independent consciousness the subconsciousness, the independent personality tends to make an independent assessment of products and determine the purchase intention. Therefore, the consumer with independent personality pays

more attention to the part of the product value in the perceived value. At the same time, the efficiency demand of independent personality determines its preference for the value of information.

Considering from many aspects, interdependent personality has a high degree of attention to the surrounding environment and a quite serious conformable mentality. Therefore, social value can attract more personality consumers. In addition, due to the happy attitude after consumption, no matter the consumers with independent personality or interdependent personality will pay attention to the entertainment value which can enhance consumption experience.

But in the aspect of consumer's emotion and behaviour, the strict self-consciousness and the independence to the environment of the consumer with independent personality make the consumer seldom integrate past experience. The process of self-consumption can often produce satisfactory emotion. The consumer with independent personality rarely has feelings of loyalty. Therefore, independent personality often produces one - time consumption behaviour. However, due to the emphasis of social environment and social relations, and the influence of herd mentality and nostalgia psychology, consumers with interdependent personality often derive loyalty to products. They often have repeated consumptions and recommendations.

Based on the above theoretical analysis and the baseline model hypothesis, the independent personality tendency leads to the responsiveness and response speed of the independent personality in the four dimensions of perceived interactivity. They are more likely to attracted by the product value and information value of the perceived value, triggering the satisfactory sense and one-time purchase. And for the interdependent personality, the reciprocity and non-linguistic information have a stronger influence in perceived interactivity. They tend to pay more attention to the pleasure value and social value in the perceived value.

Therefore, this article makes the following assumptions:

H2: self-construction plays a regulatory role in the influence mechanism model of the perceived interactivity.

H2a: the behavior of independent personality consumer in the baseline model environment tends to be rational.

H2b: the behavior of interdependent personality consumer in the baseline model environment tends to be perceptual.

4. Research Method and Sample Description

In this study, a total of 763 effective electronic questionnaires were collected, including 322 men and 441 women, respectively accounting for 42% and 58%. The distribution of income and occupation is relatively uniform, which ensures the relative scientific nature of the study.

A relatively mature scale was used in the questionnaire, and Seven Points Likert Scale was used to measure the dimensions. The perceived interactivity was measured by the assessment dimensions of JOHNSON G J[11], the author used the relative dimensions of perceived value proposed by Li Xianguo et al. for reference; the measurements of emotion and behaviour were the measurement scale by Van Nauert to measure the emotion and behaviour response of the perceived interactivity [38].

According to the scales in the questionnaire referred to the scales by Aaker and Lee (2001), the author do the research on the self-construction of the respondents. Then we divided the respondents in to interdependent self-groups (410 persons) and independent self-groups (353 persons) by two steps of clustering. Both the sample sizes of the two groups were more than 200, which satisfies the number of samples required by the structural equation model.

5. Empirical Analysis

Table 1. Measurement of Different Items

a Initial test results of factor ratio				b Determine inconsistent test items			
	IT1	IT2	IT4		IT4	IT2	IT1
IT1	—			IT4	—		

IT2	6.545*	—		IT2	2.143	—	
IT4	9.545***	2.143	—	**IT1**	**9.545***	**6.545***	—
	VA1	VA2	VA3		VA3	VA2	VA1
VA1	—			VA3	—		
VA2	6.376*	—		VA2	1.332	—	
VA3	7.552**	1.332	—	**VA1**	**7.552****	**6.376***	—
	EM1	EM2			EM2	EM1	
EM1	—			EM2	—		
EM2	**5.022***	—		**EM1**	**5.022***	—	
	BH1	BH2	BH3		BH3	BH2	BH1
BH1	—			BH3	—		
BH2	5.877*	—		BH2	1.112	—	
BH3	10.038***	1.112	—	**BH1**	**10.038***	**5.877***	—

Note: The data was the card variance of the model and the baseline model; * represented $p<0.05$; ** represented $p<0.01$; *** represented $p<0.005$.

We use Triangle Heuristic to judge the test items lacking the consistency. At the same time, to replace the row and column so that all the significant differences in the data were located on the edge of the triangle and the items on the edge were the different observation items. They were bold and italic represented in Table 1 to indicate that the reflections of the items in the two groups were inconsistent, which were the different source of the factor. The source was reflected by the factor load of each item, which was shown in Figure 1. In the evaluation of perceived interactivity (IT), there was a big difference in reciprocity (IT1). The graph showed that the IT1 factor load of interdependent self-groups was the highest. It showed the perceived interactivity of interdependent self-groups mainly came from the pleasure obtained in the social networking in websites. In independent self-groups, "response speed (IT2)" has the highest factor load. This showed that the perceived interactivity of independent self-groups in shopping sites was mainly derived from good information communication between customers and websites. In the measurement of perceived value (VA), emotional value (VA1) was the main difference between the two groups, and the factor load was highest in the interdependent self-groups. Therefore, we have confirmed that the emotional value had the most important influence on the perceived value of the interdependent group. At the same time, the influence of the information value (VA2) was most obvious in the perceived value of independent groups. It is important to note that the product value (VA3) had quite high factor loads in the two groups. This showed that the price factor was still an important factor affecting the perceived value of most consumer websites. In the two aspects of emotion and behaviour, the interdependent self-group had stronger loyalty (EM1) and repurchase tendency (BH1), while the independent self-group was more likely to have a behaviour of one-time purchase affected by the one-time satisfaction (EM2).

6. Conclusions and Suggestions

This study first validated the establishment of a baseline model for the impact of perceived interactivity on consumers through confirmatory factor analysis (CFA) and structural equation model (SEM). The results were similar to those of Mullen [28]. At the same time, by using factor consistency test, we improved the traditional multi group comparison of SEM. From the perspective of measurement and structure, we explored the different reaction tendencies of different self-constructed personalities in the baseline model.

The measurement consistency test found that for the interdependent self-groups, the degree of mutual participation and communication was the main source of their perceived interactivity. The main source of perceived interactivity for independent self-groups was the timeliness of information exchange. Correspondingly, emotional value had the most important influence on the perceived value

of interdependent self-groups. Information value had the most obvious influence on the perceived value of the independent self-groups. The product value had obvious effects on the two groups. At the same time, compared to the independent self-groups, the interdependent self-groups were more likely to produce the loyalty emotion and repurchase behavior.

The structure consistency test found that compared with the independent self-group, the perceived interactivity and the perceived value of the interdependent self-groups were more likely to trigger emotional responses such as satisfaction and loyalty. The emotional response was also more easily to be converted to buying, recommending, and repurchasing.

The significance of this study is to improve the past relationship between single analysis of perceived interactivity and behavioral responses of all consumers, and discuss the different responses of different self-constructed consumer groups when facing e-commerce sites under the baseline model. This paper accords with the research framework proposed by Zhang Chubing to introduce the moderating effect of consumer factors into perceived interactivity and enriches relevant research subjects [2]. At the same time, this paper also provides some practical guiding significance for the e-commerce website construction for different self-constructed target groups.

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