

Different Effects of Provider Recommendations and Consumer Reviews on Consumers' Shopping Efficiency for Different Product Types

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Abstract—Online product recommendations (OPRs) which include provider recommendations (PRs) and consumer reviews (CRs) are widely used in electrical environment to enhance customer loyalty. In this paper, the consumer shopping efficiency consists of screening efficiency and evaluation efficiency while the products are also classified as search products and experience products. We extend a rich theoretical framework which explains the mechanisms how quality of OPRs influences consumers' shopping efficiency and how product type plays the moderating role. Using a survey research with 182 participants, our findings provide strong support for the proposed model. The empirical analyses reveal that higher quality of OPRs is associated with higher consumer shopping efficiency which leads to higher consumer loyalty. What's more, the impacts of quality of PRs on screening efficiency are stronger for experience products than search products. However, the moderating effect of product type on the relationship between quality of CRs and evaluation efficiency is not significant.

Keywords—provider recommendations; consumer reviews; consumer shopping efficiency; customer loyalty

I. INTRODUCTION

As retailers are able to offer a larger variety of products and a greater amount of information to their customers online than they could offline, the overload of information and choice has become a main reason for limited repurchase intention of online consumers in electronic commerce trades [1]. Information personalization, or adapting product information to individual's needs, is an important method of improving consumers' information overload. And offering online product recommendations (OPRs) is one important form of information personalization carried out by online sellers, which can significantly improve customer loyalty.

System-filtered recommendations (also called "provider recommendations" [PRs]) is a widely used type of OPRs by e-commerce retailers which recommend products to customers based on their past buying behavior or on the preferences of other similar customers[2-3]. Besides, product recommendations may also draw from reviews written by consumers about the quality of products based on personal experiences with the products (also called "consumer reviews" [CRs]). An increasing number of retailers are offering PRs and CRs on Web sites to help buyers and sellers reduce information overload and improve shopping efficiency [2]. However, and although the effects of PRs and CRs on consumers' shopping efficiency has been evaluated in previous literature[4-5], the distinct effect mechanisms of both types of OPRs on

consumers' online product shopping efficiency for different product types have not yet been explicitly contrasted.

In this paper, we take account of the moderating effect of product type on the relationship between quality of OPRs and consumers' shopping efficiency. Product has frequently been categorized into search and experience goods based on the possibility for consumers to assess the key qualities of a product before purchasing and consuming it [3]. Considering that consumers' behavior changes as product type changes [4], we argue that the impacts of different OPRs on shopping efficiency are different for different product type. For example, we theorize that the impacts of PRs quality on screening cost are stronger for search products than experience products.

The rest of the paper is organized as follows. First of all, we review previous literature in related areas and introduce the theoretical background of this research. Then, we present the hypotheses and propose a novel research model that explains how different types of OPRs affect consumers' shopping efficiency for different product types and further affect E-loyalty. Next, the methodology used to empirically test the model is introduced, followed by the results of the empirical study. At last, we discuss the limitations and conclude this paper.

II. THEORETICAL BACKGROUND

A. Provider Recommendations versus Consumer Reviews

Provider recommendations (PRs) and consumer reviews (CR) are defined as different types of online product recommendations (OPRs) on web sites [2]. As OPRs can provide customers with shopping assistance, they are important for both consumers and suppliers. PRs are system-filtered content extracted from statistical analyses while CRs are firsthand content provided by consumers [3].

PRs enable a vendor to combine customers' previous buying habits with customer profile information to make automatic decisions about what data to display to the user and how to display it [7, 14, 15]. Different types of PRs have been developed, including content-based and collaborative-filtering-based recommendations which are the most widely used classes of PRs [8].

CRs are one type of recommendations that are based on consumers-created content. They was drawn from usage experiences and are directly reported by other consumers [9], whereas PRs come from statistically processing of past buying behaviors or interest profiles in addition to providing key product attributes and descriptions. PRs are used to provide

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more or less personalized product items to consumers, but CRs focus on providing feedback on a given product item (e.g., recommendations on use of presented product item). Both PRs and CRs are widely used on web sites and can help customers to make shopping decisions, but how these two types of OPRs affect shopping efficiency differently for different products still remains a question, which is the main focus of this paper.

B. Consumer shopping efficiency

Online shopping can be viewed as a household production process that requires a significant investment of human capital, mainly product knowledge and website knowledge (familiarity with the interface of website), in completing a series of purchase-related tasks. Consumers prefer online shopping store where less physical effort are required and information search and price comparisons are easier [10]. So, we focus on consumer product shopping efficiency. Product shopping is the process in which consumers engage in information search and processing to decide which product to purchase to meet their specific needs. We assess consumer product shopping efficiency using two components: product screening efficiency and product evaluation efficiency.

First, in the product screening process, consumers screen a large set of relevant products, without examining any of them in great depth, labeled a consideration set. Subsequently, in the product evaluation process, the consumer evaluates alternatives in the consideration set in more depth, performs comparisons, and makes a purchase decision [1]. Therefore, product screening efficiency is defined as the efficiency incurred and value derived from online product screening. Product evaluation efficiency is defined as the efficiency incurred and value derived from online product evaluation.

C. Customer Loyalty

The term loyalty in electronic commerce is defined as the purpose of revisiting a website [11]. Simultaneously it can also measure the loyalty with repurchasing intention of consumers [12]. This study specifies the loyalty with the intention on either revisit the website or repurchase in the future. Oliver considered that there are four primary types of loyalty are: cognitive loyalty, effective loyalty, conative loyalty and action loyalty [13]. This study specifies the loyalty with the intention on repurchase in the future as the actually shopping process can explicit the notion of Customer Loyalty relevantly.

In general, sellers focus on loyalty as the loyal consumers can create revenues and profitability. Previous literatures consider that the loyalty in electronic commerce extend from the brand loyalty [14]. The former has several unique features, such as website technology, trust and security, customer service and so on. Ratchford highlighted that the brand loyalty would increase with humans' experience at using a brand [14]. Therefore, the online Customer Loyalty can be driven by the repeat purchasing.

D. Moderator Variables: Product Type

Product type is a very important dimension in researching online shopping which has been studied extensively. Different types of products have different attributes. The consumers

estimate products through the attributes. That is, the consumer's shopping behavior will change with product attributes change, thereby affecting businesses market strategy. In this study, we categorize the product into search and experience goods. The search product was defined that consumers had actually known the quality and suitability of the product before buying it [15]. The definition of experience products are: (1) because the consumers have no direct experience to know the principal attributes of the product before purchasing, (2) compared with the direct experience of the product, it's costly or difficult to search for relevant information with mainly attributes of products, such as clothes [16]. Perceived quality of search goods relates to the property objective nature, whereas the perception of experience good depends more on the subjective attributes with a matter of personal preference [17].

III. RESEARCH MODEL AND DEVELOPMENT OF HYPOTHESES

A. Research Model

Our specific interest is in investigating how one particular form of personalized service offered by PRs, CRs, influences consumer shopping efficiency and Customer Loyalty for different type of products. To examine the role of PRs, CRs, we propose the research model in Figure 1.

B. Development of Hypotheses

As shown in Figure 1, we theorize that both provider recommendations and consumer reviews affect consumers' online product purchasing efficiency, including the product screening and evaluation efficiency.

In e-commerce trades, by guiding consumers to a set of more relevant products that are likely to match their needs, OPRs enable them to manage the large amount of information and choices available in electronic environments [3,8] which lead to the improvement of screening efficiency and evaluation efficiency [10,11]. When the PRs have a utility function that is close to that of a consumer, it can sort through thousands of options and narrow them to a handful that match the need of the consumer best. Thus, higher quality of PRs enhances consumers' product screening efficiency and evaluation efficiency. Besides, consumer reviews are rich and influential sources of information that customers perceive as useful sources of additional information [18]. CRs possess the capability to reduce the cognitive burden of sifting through multiple options, which consequently helped better evaluate product items [19,20].

Based on the above discussion, we propose the following hypotheses:

H1a: Higher quality of PRs is associated with higher consumer product screening efficiency.

H1b: Higher quality of PRs is associated with higher consumer product evaluation efficiency.

H2a: Higher quality of CRs is associated with higher consumer product screening efficiency.

H2b: Higher quality of CRs is associated with higher consumer product evaluation efficiency.

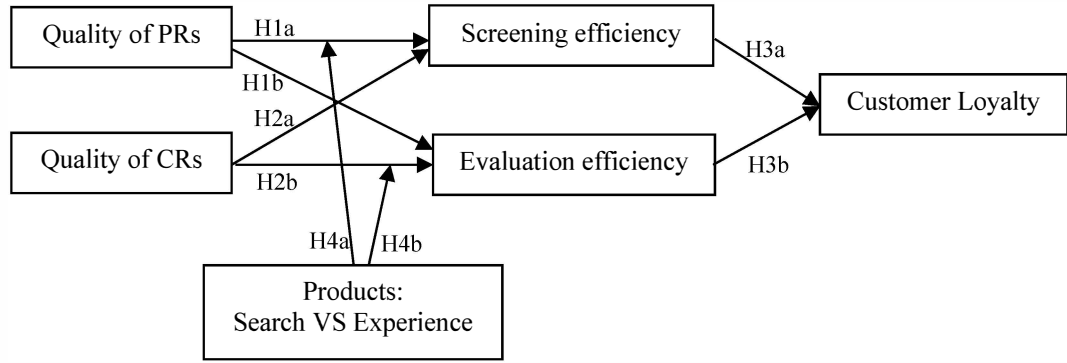


Figure 1. Research Model

Following Ratchford [14], we suggest that consumer repurchase intention online is driven by the efficiency of the shopping process (i.e., the utility maximizing consumer will be more loyal to stores that offer higher shopping efficiency). Analogously, consumers exhibit loyalty to a specific online store because it is more efficient for them to undertake the purchase at this online store compared with competing ones. Therefore, just as consumers' brand loyalty is driven by the efficiency of the production process, consumers' Customer Loyalty online is driven by the efficiency of the online shopping process. Therefore, higher product screening efficiency and product evaluation efficiency result in higher online product shopping efficiency, and ultimately higher Customer Loyalty.

Based on this, we test the following hypotheses:

H3a: Lower consumer product screening efficiency is associated with higher consumer Customer Loyalty.

H3b: Lower consumer product evaluation efficiency is associated with higher consumer Customer Loyalty.

Mitra, Reiss and Capella [21] had investigated the difference between search goods and experience goods with the information searching and behavior intention when consumers purchased. Research indicates that the consumers search more information for experience goods than search products in purchase process.

Senecal et al. theorized that the quality of experience products was uncertain before consumption, therefore the experience products rely more on recommendation and reviews of consumers [7]. That is, comparing to search product, evaluating the experience goods depend more on the consumers' affection and their subjective cognition [22].

The difference between search product and experience product is not the ability of consumers to evaluate products related attributes before and after purchasing, but the methods to deal with the searched information in the shopping process. Consumers will pay more attention to the width of searching and browse more websites to acquire the product attributes in the purchase of search product. Whereas to buy experience product, consumers will emphasize the depth of searching and look over the feedback from other consumers to obtain the product experience attributes. In light of Aggarwal, PRs may better match the information needs of search goods [23].

Based on the above discussion, we propose the following hypotheses:

H4a: The product type moderates on PRs quality and on screening efficiency.

H4b: The product type moderates on CR quality and on evaluation efficiency.

IV. METHODOLOGY

We use a descriptive survey to test above hypotheses. And in order to test and verify the moderating role of product type, two different product types (search product: book; and experience product: clothes) are used in this survey. Details of the survey, including the data collection and measurement of variables are provided below.

A. Data Collection and Sample

We tested the research hypotheses through a descriptive survey using the online questionnaire service, Sojump. This survey included 3 sections. The first section consisted of demographic questions and online shopping behaviors, such as how old they are and how long it has been from the first time they shopped online. Next, the second section was the screening question which asked the participants whether he/she pays attention to provider recommendations/consumer reviews on the website. If they answered this question as "Never", then this set of data would be eliminated during data analysis so as to remain data validity. The last section included the questions that measure the theoretical constructs. The respondents were asked to rate their level of agreement with the statements regarding their online shopping experience using a 5-point Likert-type scale response format.

182 students in university were invited to complete the survey. Of these respondents, percent of male students and female students were almost the same, 48.09 percent and 51.91 percent respectively. And all of the respondents were between ages of 18 and 31. In terms of online-shopping history, more than 50 percent of them have a history of 4-6 years. To ensure the data effectiveness, we eliminated the date of respondents who said they never pay attention to provider recommendations or consumer reviews and who finished the questionnaire within 90s. Based on this, we eliminated 8 sets of data and remained 174 sets of data. What's more, each set of data included the measurement of the theoretical constructs for search product

and experience product both, which were divided into two sets of data later. As a result of it, ultimately there are 348 sets of data available in the data analysis.

B. Measurement

All measurement scales and items are listed in appendix A. Based on the previous literature [31-32], the quality of PRs was measured with consumers' perceptions about the extent to which the recommended products fitted their taste or matched their preferences. Besides, the scale of the quality of CRs is adapted from the study of Dezhi. The scales developed by Chatterjee and Heath [25] and Pereira [20] are adapted to evaluate consumers' product evaluation efficiency and product screening efficiency separately. Finally, the dependent variable, loyalty, was measured using a scale from prior studies [34-35].

V. RESULTS

A. The Reliability Analysis

SPSS statistical software 13.0 was used to conduct the questionnaire reliability analysis. The reliability refers to a measured test scores of the credibility or the stability. That is to say, the same groups of test subjects were repeated on the same sub test scores. The reliability of the questionnaire related mainly to see the size of the Cronbach Alpha coefficients and the larger the coefficients, the higher the reliability.

B. The Validity Analysis

Validity refers to the degree of measurement tools or means to accurately measure the things that are required. As can be seen from the table 2, KMO value is 0.894. At the same time, can be seen from Bartlett test of sphericity of the statistic of 3608.703, accompanied probability is 0.000, less than the significance level of 0.05, and therefore reject the null hypothesis Bartlett test of sphericity, and considered suitable for factor analysis.

Using SPSS 13.0 for all sub-tables principal component extraction and varimax rotation method. In the validity analysis, all the indicators in the respective ownership on the factor of the load are very high. So we can conclude that the measurement scales we designed have high validity.

C. Hypothesis Tests

Here we use LISREL 8.70 software structural equation model hypothesis testing. As both the figure 1 all the Independent Variables designed have significant impact on the dependent variables as we expected.

In LISREL path (Figure 2), each ellipse represents a hidden factor, each square represents an observation, each line represents a parameter longer arrow (load value or path coefficient), and with the left and right sides of each short arrow pointing index is behind a residual factor or variable.

We performed preliminary analyses to examine the effect of the quality of PRs on consumer online product screening efficiency and evaluation efficiency. Consistent with our predictions, results of Figure 2 showed that the high quality of PRs had a significantly higher product screening efficiency

(Path coefficient is 0.36, T value is 5.53) and higher product evaluation efficiency (Path coefficient is 0.22, T value is 3.37). Therefore hypothesis H1a: Higher quality PRs are associated with higher consumer product screening efficiency, has been verified. The same, hypothesis H1b: Higher quality PRs are associated with higher consumer product evaluation efficiency has been verified.

With the data (Path coefficient is 0.35, T value is 5.50), we can concluded that the hypothesis H2a: Higher quality CRs are associated with higher consumer product screening efficiency, has been verified. The same to hypothesis H2b: Higher quality CRs are associated with higher consumer product (Path coefficient is 0.39, T value is 6.01).

We also find that the screening efficiency is positively associated with consumer loyalty (Path coefficient is 0.45, T value is 7.08) and consumer loyalty is positively related to evaluation efficiency (Path coefficient is 0.16, T value is 2.72). Therefore, H3a: Lower consumer product screening efficiency is associated with higher consumer Customer Loyalty, are supported. And the same to H3b: Lower consumer product evaluation efficiency is associated with higher consumer Customer Loyalty.

The moderate effects were also found to be significant on the relationship between the higher PRs and screening efficiency ($P=0.085$) in the study, but not on the relationship between the CRs and the evaluation efficiency ($P=0.539$). Maybe we focus on comments when evaluating the products whether they are search products or experience products. Moreover, the moderation effect of clothes ($\beta=0.581^{***}$) between PRs and screening efficiency is more than books ($\beta=0.405^{**}$). Maybe for clothes, we need more information to make decisions compared to books. Notes: Significance levels: * $p<0.05$; ** $p<0.01$; *** $p<0.001$. Furthermore, we find that the Goodness of fit of the model is also better (NFI=0.95, NNFI=0.95, CFI=0.96, AGFI=0.83).

VI. CONCLUSION AND FUTURE WORK

The goal of this study was to deal with the following questions: what's the relationship between quality of OPRs, consumers' online shopping efficiency and consumers' loyalty? And do product type moderates the relationship between OPRs and consumers' online product shopping efficiency and, if so, how? Based on the background knowledge extracted from previous literature, we extended a rich theoretical framework which explains the mechanisms how quality of OPRs influence consumer's loyalty and how product type played the moderating role. Using a survey research with 182 participants, our findings provide strong support for the proposed model and explain significant variance in the dependent and moderating variables. And the results of this study provide several important practical implications. For instance, as the impacts of PRs quality on screening efficiency are stronger for experience products than search products, it's more suitable for online retailers to improve quality of PRs for the promotion of experience products.

There are several limitations for this study to promote in future research. First, the result may not hold in all conditions

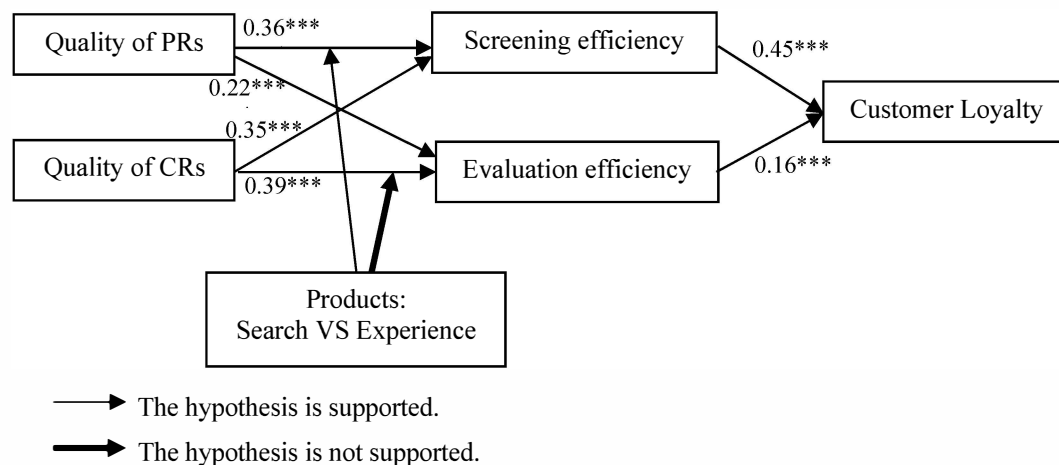


Figure 2. the Results of Research Mode

as people have been assumed no actual purchase intention when they answer our questions. Future studies are advised to test the consumers visit the website with a specific need even the product being selected. Second, the theoretical framework of this empirical study does not go through the entire shopping process. This study only considers the selection and decision-making process before purchasing and thus ignores some stages like the delivering and after-sale service which also have impact on consumers' loyalty.

Third, this study only chooses two specific products (book for search product and clothes for experiment product). The finding may not be extended to other product. So future studies should also test the other product category like virtual product (electronic book) and trust product (hotel reservation). Forth, it is recommended for future research to take other moderator variables into account. Some factors may affect consumers purchasing efficiency such as the website type and individual consumer characteristics. Finally, except for the moderator variables, future research should focus on other variables to expand the model. Some previous research indicated that perceived risk and privacy concerns are related to online shopping behaviors. One of the most significant motivations for online retailers to offer OPRs is to enhance online shopping efficiency, giving rise to the increase of customer loyalty. However, and although the influence of PRs and CRs on consumers' loyalty has been investigated in previous studies, empirical evidence about how it works is sparse. Besides, the different effects of different product types on the relationship between OPRs and consumers' online product shopping efficiency have not yet been explicitly contrasted.

This study provides a theoretical framework to investigate how both types of OPRs affect consumer shopping efficiency, how consumer shopping efficiency influence consumers' loyalty and how product type moderates the relationship between quality of OPRs and consumer shopping efficiency. And the empirical analyses reveal that that higher quality PRs and CRs are associated with higher consumer shopping efficiency leading to higher consumer loyalty. What's more, the impacts of PRs quality on screening efficiency are stronger for experience products than search products. An interesting finding of this study is that the moderating effect of product

type on CR quality and evaluation efficiency is not significant as the issue predicted. These insights not only help researchers better understand how OPRs affect consumers' loyalty in electronic environment, but also provide guidelines for online retailers to better adjust their strategies to improve customers' loyalty.

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APPENDIX A

Theoretical Constructs		Number	Items	sources
Recommendation	Quality of Provider Recommendations	PR1	In general, most items on this list match my preferences very well	Tongxiao (Catherine) Zhang (2011)
		PR2	In general, most items on this list fit my tastes very well	
		PR3	In general, most items on this list are interesting to me	
		PR4	In general, most items on this list are attractive to me	
Resources	Quality of Consumer Reviews	CR1	In general, most reviews are substantive and reliable	Dezhi Yin et al. (2014)
		CR2	In general, most reviewers are reliable	
		CR3	In general, most reviews are useful	
		CR4	In general, I believe the reviews	
Consumer Shopping Efficiency	Screening Efficient	SC1	I had no problem locating the items I was interested in.	Pereira (2001)
		SC2	It was very easy for me to locate the items I was interested in.	
		SC3	Locating the items I was interested in was very easy.	
	Evaluation Efficient	EC1	It was very easy for me to make this purchase decision.	Chatterjee and Heath (1996)
		EC2	I had no difficulty deciding which item would be best for me.	
		EC3	Making this purchase decision was an easy task for me.	
Loyalty	Loyalty	SL1	I will consider this website as the first choice to buy similar products in the future.	Jones et al. (2000), Mittal et al. (1998)
		SL2	I will buy more similar products at this website in the future.	
		SL3	I will come back to this website in the future.	