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Do Male and Female Favor Online Product Review the Same

T.W. Billy Yu

DO MALE AND FEMALE FAVOR ONLINE PRODUCT REVIEW THE SAME?

Yu, T.W. Billy
School of Business Macau Polytechnic Institute
Macau, China
e-mail: billyyu@ipm.edu.mo

Abstract

Online consumer product review is becoming increasingly important in consumers' purchase decisions. Online product review is a sort of product information created by users based on their personal usage experience. It basically serves as a passive "sales assistant" for information seeker, the customer, to check if the product matches her idiosyncratic usages. And in the consumer behavior literature, gender has been an issue because it affects consumers' approaches to decision making. Thus, in the context of product information seeking online, this paper investigates the effects on online consumer behavior from the TAM perspective. A structural equation model (SEM) on empirical data confirms that there exist some differences between the genders in the underlying mechanism on online product review.

Keywords - TAM; gender; information search; product involvement; online consumer review

Introduction

On choosing which products to buy or how to spend money is an art. Subjective evaluations by others are always valuable. People read magazines devoted to product evaluation before purchasing cars; they ask friends and read reviews by professional critics when selecting movies and restaurants. Consumers rely on advertisement, expert reviews, consumer magazine, to facilitate their purchasing decisions. Nevertheless, they may be unreliable in a way that most of them seek profits one way or the other.

Recent developments in computer networks have driven down the cost of distributing information virtually drastically, creating extraordinary opportunities for sharing product evaluations. It provides a new opportunity for consumers to share their product evaluations online [2]. In turn, it drastically reduces the costs of collecting information. With the information propagation power, a breadth of information via online user reviews is available for assisting purchasing decision. For some marketers, it is the ultimate consumer solution. It offers consumers unprecedented product information, facilitating their decision making with minimal effort and cost [15]. In this sense, it induces a new issue about information search with online reviews.

Information search is an important part of the decision process for most consumers considering the purchase of an item. Comprehensive theories of consumer decision processes [3] recognize the importance of this component and incorporate it as a construct in the models of the decision process. During the information seeking process online, the consumer is also an Internet user. The information seeker is interacting with a website. However, ideas in the IS are quite different fundamentally from those in the consumer behavior. Information system researchers believe that technology relieves the stress of communication and breaks down the interpersonal barriers such as race and gender. Researches on TAM are generally indifferent about gender [1], and for example [16]. However, gender makes a big difference from the consumer behavior perspective [8], for example [10]. Yet, little is known about the gender differences on the issue. And two aspects of the user should be considered: An online reviewer basically performs the functions of 1) a typical consumer; s/he should exhibit some characteristics of a traditional consumer and 2) a technology user which can basically modeled by a TAM.

Studies about the issue should incorporate characteristics from the consumer behavior perspective. Factors like product involvement from consumer research [31] [32] are included in this study. Our objective is thus to investigate the determinants of the use of bulletin board / chat rooms, or alike, as an information source. The inclusions of consumer behavior factors are believed to have predicting power to the behavioral intentions to websites, either direct or indirect. Of particular interest in this paper is the difference contributed by gender to the core TAM members. To assess the difference, estimates from a structural equation model (SEM) will be used.

The structure of the paper is as follows. The next section presents a brief review of the issue together with a theoretical framework. It leads to the research methodology. Data analysis starts with validation of the measurement model. Then, by studying the structural relationship, the effects of information quality and product involvement are assessed. With discussions on the results, it leads us to the ending section on the conclusions.

THEORETICAL FOUNDATIONS AND HYPOTHESES

A majority of previous research on consumer reviews centered around seller reputation, especially on the eBay platform [19][20][21]. In terms of information seeking, the reputation system provides

transparency on seller history and minimizes the risk on uncertainty about fraud. Seller reputation would be important for direct transaction; however, reviews on the product itself are equally important for prospective buyers. Such information are mostly available in third-party websites such as bulletin board and chat rooms [22][23].

Information quality is always a focus on mainstream information system research [12]. It is all the more true in the context of this paper when a website can become a customer/partnering systems [13]. It is a common belief that better information quality can lead to a better overall attitude towards a site. Previous researches also show that sales are significantly influenced by the volume of online posting, suggesting the importance of the awareness effect [18]. Some suggest that the intensity of underlying word-of-mouth plays a dominant role in driving revenues [24][25]. The persuasive impact of the reviews actually depends on both their quality and their quantity [26]. However, their researches are either theoretical or not subjected to empirical test in the individual level. And they do not examine how consumer characteristics affect the uses of websites as a form of information source for product review. Thus, this paper adopts ideas from both the TAM and consumer behaviors to solve the puzzle.

Technology Acceptance Model

Early efforts of IS research concentrated on the identification of factors that facilitated IS use. And for practical reasons, the factors are grouped into a model in a way that would facilitate analysis of IS use. The most discussed tool is the technology acceptance model (TAM). Many variations and modifications according to the applications are available in the literature [11]. But the core members remain quite similar. This research involves three core members [14] and they serve as the backbone. The TAM here starts with *perceived usefulness, which leads to the attitude to the site, which leads to the intention to use.* These form the two basic hypotheses from the generic TAM. The study here is simply a case on third-party websites for product review. And that these sites do not involve in the transaction of the products under reviewed. Examples are bulletin board, chat room and personal blog.

An augmented member to TAM is of particular interests here. It is the information quality of the site. It is commonly believed that better information quality can lead to a better overall attitude towards a site as well as to positive behavioral intentions. Furthermore, in the context of product review, people have expectation on the site about its ability in providing useful information, and hence the usefulness perception and the attitude towards the site [23][25]. Thus, *information quality is hypothesized to positively affect all the three core members in the generic TAM.* These hypotheses are shown graphically in Fig. 1 at the end of the paper.

Individual Differences

For the sake of simplicity and focus, researcher on the Flow Theory incorporated with TAM does not hypothesize on any possible differences in online consumer due to gender or age [16]. However, in the definition of consumer behavior, consumer actions are dependent on the thinking process, in the direction to satisfying their needs. From this standpoint, male and female have different ways of thinking as well as behavior. Researchers confirm that gender affects consumers' approaches to decision making [10]. The case in this paper is about the use of the tool – the use of third-party website for assisting purchasing decision. From the consumer behavior literature, we know that male exhibit a weaker sensitivity to the opinions of their friends [1] and have fewer interpersonal relationships [6]. Nonetheless, male show a greater interest in communications technology products [7]. Researchers also confirm factors like satisfying, time and economy seeking are concerns for men [10]. Thus, male and female should also behave differently in using a bulletin board as the information source for product review. More precisely, we are interested in testing if *male is more capable of using online product review information than female (H6).* On the contrary, because of their interpersonal communication ability, *female is more capable of reviewing product information with her interpersonal relationships (H7)*. However, the difference in online product review ability of the two sexes with bulletin board remains unsure due to disagreeing forces working on him.

Besides gender, the study should also consider and be controlled for more individual differences as defined under consumer behavior. Two such items are taken into account. They are product involvement and time cost of an individual.

Product involvement reflects the perceived relevance of the product category to the individual. It has a strong effect on the positive shopping experience and the intention to return to the website [16]. However, according to the TAM, such intention may arise from its two antecedents: the perceived usefulness and attitude of the website.

Should product involvement affect perceived usefulness only - treating it as an external variable in the original TAM (interested reader may refer to Fig. 2 in [11] for detail); or, should it be treated as a factor affecting attitude? To study this, we have to understand the background of the TAM. It is basically a belief–attitude–intention–behavior relationship, which predicts user acceptance of IT. In the well-accepted TAM, belief is the belief of perceived usefulness of the site to the user. But user satisfaction is typically viewed as the attitude [1]. One antecedent

of such satisfaction is the product involvement [4]. Thus, two hypotheses are proposed: *Product involvement induces perceived usefulness and positive attitude towards the website.* And since attitude is involved, intention to use is more of a result of the attitude rather than the product involvement.

Time cost is the perception of costs in undertaking the review, including the psychological costs of processing information. A major component is the value of time for the online user. By assessing time availability, we estimate such perceived value of time [27]. In researches related to information seeking, it is always an important variable to determine the use of information sources. In time scarcity of an average Internet user and the availability of the website as a convenient information source [15], it is reasonable to consider it as a control variable, and thus, we have these two hypothetical relationships for controlled testing: *time cost will positively affect the perceived usefulness and attitude towards the website*.

Methodology

Research Design

It is an empirical study using a questionnaire to measure individual consumer perceptions of the research constructs using multiple-item scales. The measurement instruments are adopted from previous studies that are well-accepted and reported with satisfactory statistical reliability and validity, although we test it again for our newly collected data. The questionnaire asks for a specific product that a user may have experience in reviewing online. The products are shortlisted items developed from a pilot test involving open-ended discussions with 80 undergraduate students. The list includes low-end product like sport shoes to high-end electronic product like mobile phone. This design helps identify subjects with potentially different level of product involvement due to individual difference in needs.

The questionnaire also contains instructions asking the respondent to identify a Web site that he or she has used for product review. The subject should recall the name of website and then answer the questions pertaining to that recalled website. Moreover, the subject should also identify if it is a "bulletin board/chat sources or alike".

Measurement Scale

TAM is the basic model. Unlike some researches [16], the original construct "attitude towards the website" is not ignored and intentionally kept as it directly contribution to "intention to use the system" in the original TAM. The three dimensions are "Usefulness" (4 items), "Attitude towards the website" (4 items) and "Intention to use the system" (3 items). All items used the original seven-point Likert scale.

An augmented site characteristic is information quality. It is modified from [30] and measured by 8 items based on the user assessment of the information on eight aspects, including accuracy, timeliness, relevance, right level of detail, trustworthiness, sufficiency of hints to reflect the trustworthiness and lastly the ability to reflect fairness of the information. It is measured in the original designed seven-point Likert scale.

To primarily test the hypotheses on the difference between male and female, measures are developed based on key findings from online use of information sources [17]. The respondent is asked to report the time, in hour, he or she used to review the product. There are altogether six sources of information: three for online. They are the 1) manufacturer/dealer sources, 2) the buying services and other third parties, and 3) the bulletin board/chat sources. Each of them has an offline counterpart. They are 1) the dealer visits/advertisements, 2) the consumer reports and other print information and 3) the interpersonal contact with friends/relatives. The subject is to indicate his or her total time spent on them. With a transformation procedure, as proved mathematically and validated empirically by Ratchford et la [17], the corresponding ability in using the source can be detected.

For the individual characteristics, product involvement and its measurement have been the source of considerable research and debate since Personal Involvement Inventory was first proposed and analyzed by [31]. While there have been many variations on the definition of involvement, the Revised Personal Involvement Inventory [32] is adopted for this research. It encompasses the most important and academically accepted elements for motivational state activated by the product [33]. It is a 6-item scale and the original seven-point Likert scale was used.

The last measure is on time cost. It reflects the search effort by measuring the respondent's own perception of how much effort is put into the search of information. It was a 3-item scale developed by [34] and the original seven-point Likert scale was used. This instrument is as shown in TABLE I.

Sample

Chinese Internet users were our research subjects. They were randomly selected in this study. A brief introduction about the survey was provided to each invited user. If a user had experience in online review that product, he or she was invited to complete the questionnaire anonymously. The final sample size is 766. Within them, 396 are males, 370 are females. Within them 232 have age below 20 (30.3%), 457 age between 20 and 25 (59.7%) and 77 of the sample age above 25 (10.1%). 69% of them are studying either fulltime or part-time and 85.1% have a job. The total time spent on product review has a mean of 5.2 hours, with a standard deviation of 4.7 hours.

TABLE I. THE SURVEY INSTRUMENT MEASUREMENT MODEL

Construct	Item	CFA Loading
Perceive usefulness	Using the site . . .	
	. . . improve my shopping performance.	0.74
	. . . increase my shopping productivity.	0.86
	. . . increase my shopping effectiveness.	0.86
	. . . is useful.	0.69
Information quality	The site provides … information.	
	. . . accurate. . .	0.78
	. . . timely. . .	0.76
	. . . relevant. . .	0.82
	. . . at the right level of detail. . .	0.8
	. . . believable. . .	0.78
	. . . hints to reflect the trustworthiness of. . .	0.73
	. . . notes to reflect fairness of. . .	0.73
Intenetion to use	To use it..	
	Assuming I had access to the site, I intend to use it.	0.89
	Given that I had access to the site, I predict that I would use	0.89
	I intend to visit it in the near future.	0.87
Attitude	Reviewing a product on this website . . .	
	. . . makes me feel _____ (good)	0.82
	. . . would be _____ (pleasant)	0.84
	. . . is a _____ idea (good)	0.86
	. . . is a _____ idea (wise)	0.76
Product Involvement	To you, the commodity is:	
	Unimportant.....Important	0.72
	Irrelevant.....Relevant	0.72
	Unexciting.....Exciting	0.79
	Boring.....Interesting	0.79
	Not fun.....Fun	0.77
	Unappealing.....Appealing	0.79
Time Cost	How about your feeling of the followings.	
	I seem to be busier than most people I know	0.69
	Usually there is so much to do that I wish I had more time	0.88
	I usually find myself pressed for time	0.81

Analysis

Presence of gender difference

From the theoretical perspective of the consumer's choice of information sources [17], the shares of use of each source identify the differences across individuals in their ability to use different sources. The transformation involves a recoding procedure. The total time in information seeking for each individual was used as the base for the share; and the shares of the total online time, bulletin time and interpersonal contact time were calculated. Results show that there is a significant difference between male and female in general online review ability (H6) and review ability particularly with interpersonal contact (H7), TABLE II. It confirms our hypotheses. However, they do not show difference in the ability to use bulletin board as an information source. It concludes that, the ability on online product review with bulletin board is more or less the same between male and female. It may be due to the fact that disagreeing forces are acting at more or less the same magnitude.

TABLE II. T-TEST OF ONLINE REVIEW ABILITY

Ability to use the resource for product review	SEX	Mean Share	Std. Deviation	Levene's Test for Equality of Variances	t value - according to the Levene's Test
General Online resources	Male	0.583	0.164	0.163	2.366 *
	Female	0.556	0.152		
Bulletin Board	Male	0.255	0.169	0.001	1.874
	Female	0.234	0.137		
Interpersonal Contact	Male	0.164	0.103	0.401	-2.203 *
	Female	0.180	0.098		

* - significant in the 0.05 level

Measurement Model

Most variables of interests cannot be measured directly as they are not observable. They are called latent variables, but the measurement should be validated before the analysis for casual relationship. To validate the measurement model, this paper uses a confirmatory factor analysis (CFA). In it, the latent variables are hypothesized and are approximated by the observable variables [37]. It is a proven technique and has been extensively used in econometrics, marketing, sociology, and education [35] [36].

LISREL 8 was used to test the measurement model and to ensure convergent and discriminant validity [42]. The analysis results on CFA report Degrees of Freedom 309 and a $\chi 2$ value of 1117.9. Although the P value is 0.0, the Root Mean Square Error of Approximation (RMSEA) is 0.058 (<0.10) [38]. Goodness of Fit Index (GFI) is 0.902; the Normed Fit Index (NFI) is 0.968; Non-Normed Fit Index (NNFI) is 0.973; Comparative Fit Index (CFI) is 0.977. All these results indicate acceptable fit [40]. Moreover, all indicators load significantly to their corresponding factors; satisfying the test for convergent validity [41]. Table I shows the CFA loadings. Reliability test also shows that all the latent variables have Cron-Alpha values greater than the threshold of 0.7.

Since all six latent variables were measured by items in a questionnaire completed by a single respondent, we also check for common method variance [45]. All the measuring items were entered into a principal components factor analysis. It produced six factors, with the first factor explaining only 35 percent of the variance. Moreover, no general factor was apparent in the unrotated factor solution. Thus, common method variance should not be a problem in the study [46]. With these evidences, we confirm the measurement model and can process to the structural analysis.

Stuctural Model

The result for the structural equation models are shown in TABLE III. All these indicate a acceptable fits with the empirical data. The standardized estimated structural equations coefficients are presented in TABLE IV. The analysis confirms most of our hypotheses. Ironically, the TAM for male differs from the female's, under the study in bulletin board for product review purpose.

TABLE III. FITTING STATISTICS ON THE STRUCTURAL MODELS

	Overall	Male	Female
Sample size	766.00	396.00	370.00
Degrees of Freedom	312.00	312.00	312.00
Minimum Fit Function Chi-Square	1124.49	768.70	848.46
Normed Fit Index (NFI)	0.97	0.96	0.95
Non-Normed Fit Index (NNFI)	0.97	0.97	0.96
Parsimony Normed Fit Index (PNFI	0.86	0.85	0.84
Comparative Fit Index (CFI)	0.98	0.98	0.97
Goodness of Fit Index (GFI)	0.90	0.87	0.86

TABLE IV. STANDARDIZED ESTIMATED IN THE MODELS

	Description	Overall	Male	Female
H1	Perceived Usefulness leads to the Attitude	0.11	0.16 *	0.05
H2	Attitude leads to the Intention to use	0.41	0.41 *	0.41 *
H3	Information quality positively affects Perceived Usefulness	0.60	0.55 *	0.67 *
H4	Information quality positively affects Attitude	0.51	0.50 *	0.54 *
H5	Information quality positively affects Intention to use	0.44	0.44 *	0.43 *
H8	Product involvement induces perceived usefulness of the website	0.10	0.19 *	0.01
H9	Product involvement induces positive attitude towards the website	0.21	0.20 *	0.21 *
H1 0	Time cost will positively affect the Perceived Usefulness of the website	0.06	0.06	0.05
H1 1	Time cost will positively affect the Attitude towards the website	0.04	0.05	0.03

* - significant in the 0.05 level

For male, the product involvement is of much greater influence to the perceived usefulness of the bulletin website (H8). The standard errors are 0.053 and 0.052 for male and female, respectively. And for female, the information quality is of much greater influence to the perceived usefulness of the bulletin website (H3). The standard errors are 0.055 and 0.062 for male and female, respectively. These two differences are significant to the 0.05 level. Moreover, the long-held gender-indifferent TAM is challenged together with these differences. Perceived usefulness may not lead to positive attitude towards a bulletin board when it is used for product reviews (H1). (The standard errors are ignored here due to the insignificance of the path in female group.)

Male (generally more technology affinity but exhibit a weaker sensitivity to the opinions of their friends [1]) actually does not care as much as female does in the review information. Thus, information quality exhibits less influence to the perceived usefulness in the male group. Nevertheless, male shows a greater interest in communications technology related matters [7], satisfying this need of him is more essential [10]. A proper bulletin board serves this purpose in a timely and economic manner [10]. These fulfill the requirement of male. The more his product involvement is, the more is such need for a website. Thus, his product involvement plays a more dominating role in the perceived usefulness of the bulletin board.

The insignificant path of H1 in the female group can be explained by the fact that information quality actually dominates the influence to attitude towards the bulletin board. The general information quality is very important to female, as that is the cue for her evaluation of her satisfaction due to the service quality of the information source [47] - the alternative way to the attitude towards the bulletin board [1]. At the same time, in the correlation relationship among the three latent variables – perceive usefulness, information quality and attitude towards the bulletin board, information quality actually partials out the correlation between perceive usefulness and the attitude towards the bulletin board. All these make happened the very low correlation between the two TAM members.

It might be that the above gender-related differences are due to the difference in internet information search skill[1] between the genders. Thus, here presents a post-hoc analysis to address the suspicion. However, the internet information search skill is a formative measure [43]. It is too complicated to handle with the structural model as shown in Fig. 1 [44]. Instead, we use multiple regressions on the summative measures to reveal the effect of the search skill on the two involved hypotheses, H1 and H8 in TABLE V.

TABLE V. POST-HOC MULTIPLE REGRESSION

Hypothesis		Beta	t	
H1	***Perceived Usefulness leads to the Attitude***			
	Internet Info Search Skill	0.027	0.833	
	Perceived Usefulness	0.456	14.142	*
H8	***Product involvement induces perceived usefulness of the website***			
	Internet Info Search Skill	0.023	0.656	
	Product Involvement	0.203	5.734	*

* - significant in the 0.05 level

Just as Koufaris predicts [16], gender does make a difference in the TAM model under specific context. The test of the models provides the evidence. In the context of product review, information quality and product involvement play important roles in the TAM. These can be explained by the literature in consumer research, which identifies that gender makes some differences.

Conclusions

This paper has presented a casual model from the consumer behavior perspective on top of the technology user model. The SEM analyses provide a holistic view of the latent variables under investigation. Empirical evidence shows that the mechanism behind TAM may differ according to gender. As a result of the considerable differences in the context of product review between males and females, it may be necessary to devise a more gender-specific strategy for building a bulletin board for the purpose. Although female is less sensitive to technology and use online resources for product review less, our result suggests that female demands more information quality on bulletin board. This piece of information would be valuable for online companies when they like to differentiate themselves from their competitors with a gender focus. The implication is that, for site or blog owner interested in product review, they should work on promoting information quality, as it is more important for female.

[1] As one of the reviewers kindly suggested

For the moderator, if any, domain expertise on the product is thus more important than social skills or technological skills in site development. Development skills are however important, when such skills are directed to develop interface to encourage other participant to review a product. Practitioners may seek advice from such experts, e.g. [48][49]. This could also be accomplished and enhanced by highlighting provisions to specific gender. For instance, fashionable and attractive styling is very important to females [10]. And, this issue is highly related to the information quality of timeliness.

Care should be taken when generalizing the results of our study. Consumer behavior itself is a multi-faceted concept, and although our study focused on a major component of product involvement, which is related to the consumer's need and information search motivation, other components like demographics, psychographics, personality, motivation, knowledge, attitudes, beliefs, and feelings could yield different results. Our study also had some limitations due to the use of young subjects in our experiments; however, they had similar profiles to those of typical web shoppers but did not include novice or older potential online customers.

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Figure 1. The structrual model