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The Influence of Online Product Presentation and Seller Reputation on the Consumers' Purchase Intention across Different Involvement Products

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THE INFLUENCE OF ONLINE PRODUCT PRESENTATION AND SELLER REPUTATION ON THE CONSUMERS' PURCHASE INTENTION ACROSS DIFFERENT INVOLVEMENT PRODUCTS

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Abstract

In online market, consumers tend to make use of other signals when assessing the product quality due to the aggravated information asymmetry. Taking the moderating effects of product involvement into account, this paper developed a research model to study the influence mechanism of product information presentation and seller reputation on consumers' perceived product quality and purchase intension. A lab experiment was designed to prove the research model, in which 57 participants' questionnaire data was collected and eye movement data was recorded by SMI Hi-speed eye tracker when they viewed the website. The results showed that perceived product information presentation and seller reputation positively influenced consumers' perceived product quality which further more affected the willingness to buy, with the moderating effects of product involvement. More specifically, the impact of perceived product information presentation got weaker when seller reputation got higher for low-involvement product.

Keywords: Signaling theory, online market, product information presentation, seller reputation, product involvement, perceived product quality

1 INTRODUCTION

According to the 29th report on Internet development in China released by CNNIC, by the end of 2011, the number of online consumers in China had reached 194 million, with an annual increase rate of 20.8%. At the same time, the report on online shopping in China released by iResearch shows that the size of e-commerce market in China reached 773.56 billion in 2011.[1] Online shopping plays an increasingly important role in people's daily life. However, the online environment makes it harder for consumers to judge the quality of products as they cannot touch or feel the products directly. There are strong information asymmetries existing between online sellers and buyers.

Signaling theory, from a perspective of seller, thinks sellers could send other information which conveys information of the product quality when it is difficult to present the product itself. And the information used to diagnose product quality by the buyers is called signal in this theory (Rao et al. 1999). Based on this theory, researchers found seller reputation, advertise investment, assurance, e-image and website quality could affect online consumers' perceived product quality, perceived risk and purchase intention (Biswas & Biswas 2004; Aiken & Boush 2006; Gregg & Walczak 2008; Wells et al. 2011).

Many of these research only focused on seller-level information signals to reduce the uncertainty towards seller, while product-level factors didn't receive enough attention so far (Dimoka et al. 2012). In recent year, there were a few empirical research about online product presentation indicating the important influence of online product presentation on consumers' perception (e.g., Jiang & Benbasat 2007; Park et al. 2005). However, the joint influence mechanism of online product presentation with seller-level information remains unclear. Thus, the purpose of this study is to figure out that whether product information presentation is a signal to affect consumers' perception of product quality and purchase intention and how it takes effect with the moderation of seller reputation and product involvement.

In the following sections of this paper, a review of relevant literature comes first in section 2, research model and hypotheses are developed in section 3. In section 4, the research methodology is reported. Data analysis and results are in section 5. The final section discusses the results and the implications of the study as well as the limitations and possible future research directions.

2 LITERATURE REVIEW

2.1 Signaling theory and its application in online context

The concept of signaling theory is derived from information economy, which means sellers may send signals to help consumers diagnose product quality when information asymmetry exists (Boulding & Kirmani 1993). In another word, signals can serve as indicators of product quality when the product intrinsic information is not available. A signal should be visible, credible and differentially-costly (Dimoka et al. 2012). Extrinsic attributes of product such as price, brand name and packaging were regarded as signals in traditional consumption research (Rao 2005).

Unlike physical stores, the product presentation in online stores is constrained by the Internet technology, which aggregates information asymmetry. Especially for experience product, some of whose attributes will show only after it is used, this limitation becomes more obvious. Facing the risk and difficulty brought by information asymmetry, consumers may rely on other information in their judgment of product quality. This was also proved in an experiment which showed online consumers were more dependent on other information to diagnose product quality than in-store ones (Biswas & Biswas 2004). The increase of information asymmetry and the change of shopping environment generate the application of signaling theory to online consumption research. Table 1 summarizes some typical signals which have already been proved to have the function of affecting online consumers' perception.

1 Data from http://finance.jrj.com.cn/tech/2012/01/18142512085977.shtml.

Author	Signal	Dependent Construct	Result
Biswas & Biswas (2004)	Seller reputation Advertising investment Warranties	Perceived risk	Online consumers are more dependent on signals to diagnose product quality than offline ones.
Aiken & Boush (2006)	Trust marks Objective ratings Advertising investment	Perceived reliability	Trust mark will increase consumers' perceived safety and privacy especially when it exists alone.
Gregg & Walczak (2008)	E-image	Willingness to buy Price premium	E-image positively affects consumers' willingness to buy.
Wells et al. (2011)	Website quality	Perceived product quality Purchase intention	Website quality is a credible signal when the degree of information asymmetry is high.

Table 1. Typical Signals of Online Consumption in Previous Research

Earlier researchers regarded reputation, advertising investment and third-party authentication as signals, while later researchers integrated information system factors, such as E-image and website quality into signaling research, which shows a transition of driving factors in consumer behaviour research when research objective changes from in-store consumption to online consumption.

However, signals prominently consist of seller-level factors like reputation, objective rating, trust mark and seller image, which affect consumers' perceived product quality through reducing consumers' uncertainty towards the seller. Product-level factors which may also influence consumers' perceived product quality didn't receive enough attention in previous research. It was found in an experiment research that consumers over 25 attached great importance to product information in online shopping (Williams & Larson 2000). Due to the absence of verbal communication with the seller and the difficulty of observing product directly, product information presentation becomes more vital in online context. Taking both seller-level and product-level factors into account, this study aims at exploring the impact of product information presentation on consumers' perceived product quality and purchase intention.

2.2 Presenting online product

In online consumption, the present information of product on the website is the most direct source consumers can use to diagnose the product quality. So far, product information could be present in the formats of text, picture, video, audio and virtual product experience. The effect of presentation format differs from product types, consumers' familiarity towards the product, task complexity and other factors, which makes it difficult to determine which format is the best. Table 2 summarizes some typical advice about how to present product information on website suggested by previous researchers.

Systematic theory framework of product information presentation was not found in previous research. Take the format of picture for example, many researchers have explored the effects of the size, position and colour of the pictures separately. But the interaction between these factors and the total effect of these factors were not clearly examined in previous research. Besides, separating these factors may reduce their own effects on consumers. This is supported by an experiment in which researchers found the factor of picture size affected consumers' emotion only when it was combined with the factor of the movement of the picture (Park et al. 2005).

2.3 Product involvement

Previous researchers found that consumers would positively search for and make use of information to help them make informed decision (Zaichkowsky 1985). This positivity may be affected by different individuals, product types and shopping conditions. Zaichkowsky (1985) has conceptualized it as personal inventory involvement (PII), which represents the relationship between individual and product. And this kind of relationship is driven by the individual's inside needs, value and interest. Thus, PII can be measured by a 7-item scale regarding individual's characteristics.

PII reflects how an individual is involved in the product, which will affect one's mental activity and behaviour. In detail, facing a high-PII product, consumers are more needy for information, increase total and directed cognitive-response activity, and conduct a complex decision-making process; on the contrary, facing a low-PII product, consumers pay less attention and conduct minimal encoding when they make the decision (Andrews et al. 1990).

Perspective	Author	Advice
Text	Nelson (1974)	Text is always used to describe the search attributes of product[2].
	Bone and France (2011)	Compared to the information conveyed in text, consumers rely more on the one contained in pictures when assessing the product quality.
Picture	Then and DeLong (1999)	The pictures should be combined with similar items and be present from various angles.
	Dimoka et al. (2012)	Low-quality sellers are reluctant to present pictures of product due to the risk brought by the variance of actual product and the pictures.
Multi-media	Jiang et al. (2005)	Multi-media, such as video and virtual product experience, is instrumental in relieving attention resource and memory load.
	Park et al. (2005)	Dynamic presentation format will increase consumer's pleasure, which positively affects the willingness to buy.
Others	LaRose (2001)	Vivid and bright presentation of product receives more attention from consumers.

Table 2. Advice about Presenting Product Information on Website

3 HYPOTHESES AND RESEARCH MODEL

3.1 Perceived product information presentation and perceived product quality

The intrinsic attributes of product have been proved to affect consumers' perceived product quality (Chang & Wildt 1994). Besides, the format of presenting product information, such as the size and the amount of pictures, will also influences consumer behaviour. This study regards the content of product information and the format of presenting product information as a whole concept of product information presentation.

This study takes several presentation advice discussed in literature review into consideration, formatting two levels of product information presentation which possess different presentation effects for the following reasons:

- The effect of product information presentation on consumer behavior is more notable when diverse formats are combined together.
- The purpose of this study is to test whether product information presentation will affect consumer behavior rather than to find out the best presentation format.

Additionally, multi-media format is not considered in this study because it is still under its early development (Dimoka et al. 2012). The features of two different levels of product information presentation are listed in Table 3. High-level or advanced product information presentation contains pictures from different angles to demonstrate the out looking and functions of product, illustrates product attributes through the combination of text and picture, arranges the information elaborately with aesthetic advantages; Low-level or common product information presentation contains no picture, uses text alone to illustrate product attributes, lists the information disorderly.

Due to the differences between individuals' aesthetic perception of page arrangement, this study tests the effect of product information presentation on perceived product quality by the construct of consumers' perceived effect of the presentation format. Everard and Galletta (2005) found that the perception of flaws on website rather than actual flaws influenced users' perception of quality. Thus, it can be inferred that perceived product information presentation has more direct and significant effect

2 Cited from Jiang, Z. The effects of presentation formats and task complexity on online consumers' product understanding MIS Quarterly, 2007, 31 (3), 475-500.

on consumers' attitudinal behaviours. Previous research suggest that web diagnosticity constructs may effectively reflect consumers' perceived product information presentation (Mavlanova & Benbunan-Fich 2010). This study modifies website diagnosticity construct and web quality construct into a new construct containing 4 items to measure consumers' perceived product information presentation. We name this construct "perceived product information presentation" which consists of two dimensions:

- Information quality-if the information is adequate and detailed enough to help consumers accomplish their shopping tasks;
- Aesthetic appeal-if the layout of information is well designed and instrumental in consumers' acceptance of information. This dimensionality of perceived product information presentation is in accordance with the formative aspects of the construct of product information presentation.

Element	High-level (advanced)	Low-level (common)
Picture	Several pictures from different angles	None
Illustration of product attributes	Product attributes illustrated by text and pictures	Product attributes illustrated by text alone
Arrangement of information	Elaborately arranged with aesthetic advantages	Less arranged

Table 3. 2 Levels of Product Information Presentation

Thus, we consider perceived product information presentation a valid construct to measure how consumers feel about the format of product information presentation. Besides, as a cognitive construct, perceived product information presentation has more decisive impact on behavioral outcomes. Therefore, the following hypothesis was formulated:

H1: Consumers' perceived product information presentation will positively affect his perceived product quality.

3.2 Perceived product information presentation, seller reputation and product involvement

Previous research have proved that reputation, advertisement, assurance and other seller-level factors could work as signals (Biswas & Biswas 2004; Aiken & Boush 2006; Gregg & Walczak 2008; Wells et al. 2011). Among them, seller reputation is a remarkable factor used by consumers to diagnose the quality of seller's product (Dawar & Parker 1994). Sellers who provide high quality product have an incentive to maintain a good reputation which is rewarded with high profits in the future (Shapiro 1983). Thus, it is reasonable to assume that seller reputation is instrumental in judgment of product quality especially when intrinsic product information is limited. Therefore, the following hypothesis can be derived.

H2: Seller reputation will positively affect consumers' perceived product quality.

Online consumers tend to rely on signals in their judgment of product quality due to the difficulty of observing product directly. As a result, the function of product-level factors may be covered by other stronger signals. Signals hold different reliability (Utz et al. 2012). Compared to product information presentation, seller reputation is more objective and cannot be easily manipulated by the sellers, which means seller reputation may have a stronger impact on perceived quality. When a stronger signal, such as seller reputation exists, the effect of perceived product information on perceived product quality may be weakened. Therefore, the following hypothesis can be derived.

H3: There is an interaction effect between perceived product information presentation and seller reputation. When seller reputation gets higher, the function of perceived product information presentation on perceived product quality gets weaker.

In online consumer behaviour research, some hold the view that the characteristics of product itself will also influence consumer behaviour (Everard & Galletta 2005). The cognitive behaviour consumers adopt varies from the product's attractiveness and importance towards them. The difference of the degree of attention consumers pay and the way of information process consumers adopt can be

measured by the concept of Personal Inventory Involvement (PII) (Andrews et al. 1990). PII refers to the extent to which consumers can be involved in this product (Zaichkowsky 1994), which is driven by individual characteristics, product types and shopping conditions, such as price, interest and perceived risk. This study focuses on the behaviours the same individual adopts in the same shopping environment towards different products. Consequently, the difference of the PII of different products mainly comes from the characteristics of product itself. Products with different PII will lead to consumers' different information processes. Thus, this study thinks that when faced with a high-PII product, consumers will be more careful in their information process, and be more rely on the information present on the webpage in their assessment of the product quality. And this reliance on present information is not easily weakened by the attendance of high seller reputation. On the contrary, when faced with a low-PII product, consumers' expectation for product information decreases, which means perceived product information presentation's effect on perceived product quality is vulnerable to other signals such as seller reputation. Therefore, the following hypothesis can be derived.

H4: Product involvement moderates the influence of seller reputation and perceived product information presentation on perceived product quality. Specifically, for low involvement product, when seller reputation gets higher, the function of perceived product information presentation gets weaker; for high involvement product, this interaction of seller reputation and perceived product information presentation does not work.

3.3 Perceived product quality and purchase intention

As a psychic activity of consumer, perceived product quality will further affect consumers' behaviour. What's more, as an attitudinal measurement towards objective, perceived product quality will positively affect purchase intention (Wells et al. 2011). This was supported by a research which proved that perceived product quality influenced purchase intention by affecting perceived product value (Chang & Wildt 1994). Therefore, the following hypothesis can be derived.

H5: Perceived product quality will positively affect purchase intention.

3.4 Eye-movement data

Consumers' information process of the webpage will be reflected by his sight. For example, long fixation time and more fixations of some area in the webpage infer a deep information process toward the area (Pan et al. 2004). Besides, eye-movement data can be a supplement to the questionnaire in a more detailed and objective extent (Djamasbi et al. 2010). Thus, it can be inferred that when consumers' need for product information increases, there will be more fixations on the webpage. Therefore, the following hypothesis can be derived:

H6: For low-involvement product, when seller reputation gets higher, the fixation time and the number of fixations in product detailed information area decrease; for high-involvement product, the decrease of fixation time and the number of fixations in product detailed information area are not significant.

Based on the hypotheses proposed above, we put forward a research model as showed in Figure 1.

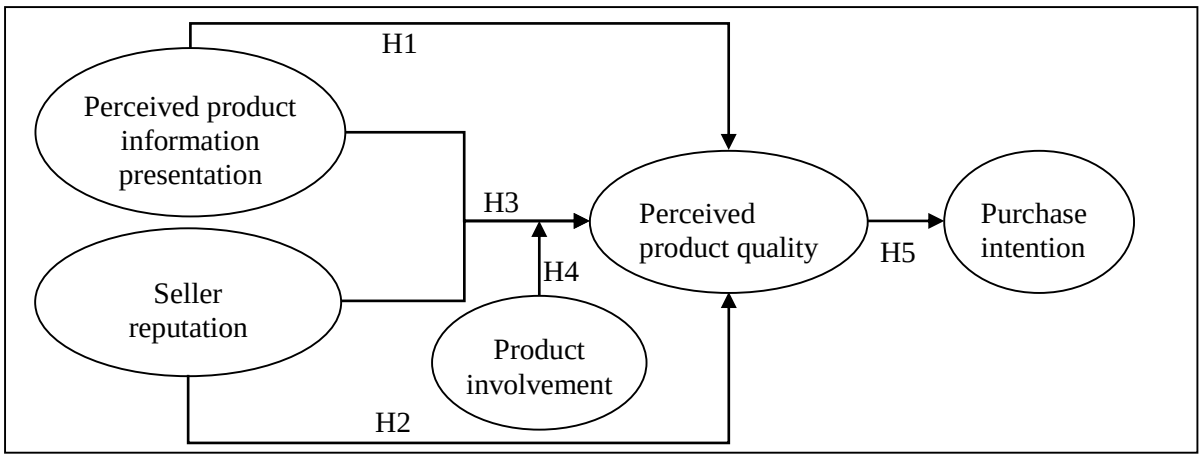


Figure 1. Research Model

4 METHODOLOGY

4.1 Experiment design

A 2×2×2 (i.e., 2 levels of product involvement×2 levels of product information presentation×2 levels of seller reputation) laboratory experiment was conducted to test the research model. Seller reputation and product information presentation are between-subject factors. Seller reputation controlled by the amount of seller's historic transactions and a relative credit score received from buyers. Product information presentation was differentiated by manipulating information content, amount of pictures and information arrangement. Product involvement is a within-subject factor, manipulated by selecting two types of products with different involvement through pre-test.

4.2 Experiment apparatus

The eye-tracking device used in this research was the Hi-Speed iView X eye-tracker produced by the German company SMI. Its sampling rate is 500 HZ. The infrared camera is used in the Hi-Speed eye-tracking equipment to capture the video image of subjects' left eye. Signal export from the camera is first coded using MPEG coding rule and then enter the computer for the collection and analysis of image data, thus the moving distance, speed, pupil diameter and fixation position of the eye can be calculated in real time. The experimental webpages were presented in a 19 inches monitor with a resolution of 1024*768 pixels. The distance between monitor and subject was approximately 60cm. The eye-tracking data of websites browsing in the experiment was recorded automatically by the eye-tracker and analysed using the software BeGaze 2.5 matched to the eye-tracker.

4.3 Experimental webpages

Since the subjects of this experiment came from campus, the electronic product was chosen as experiment product for its popularity among university students. Before the experiment started, a survey was conducted to find out 2 kinds of electronic products which are significantly different regarding to PII. In the survey, the PII of 7 kinds of electronic products (laptop, mobile phone, electronic dictionary , MP3 or MP4, flash disk and other digital accessories, digital camera, hair dryer) were measured in a 9-items scale adapted from Zaichkowsky (1994)'s PII scale. According to the statistics results, laptop which got the highest PII score and electronic dictionary which got the lowest PII score were selected as the experiment products. Based on the deduction in section two, two levels of product information presentation were developed through the manipulation of pictures, illustration of product attributes and arrangement of information.

It is confirmed in prior research that credit score is the most important factor that may affect seller reputation (Jiang et al. 2011). And taking the reputation system in the real online shopping website into consideration, seller reputation in this study was manipulated by the amount of seller's historic amount of transactions and the relative credit score. Large amount of seller's historic transactions and high relative credit score represent high seller reputation, while small amount of seller's historic transactions and low relative credit score represent low seller reputation.

Eight shopping webpages with different levels of product information presentation, seller reputation and product PII were designed using software Axure RP Pro 6.0. The samples of these webpages (laptop) are shown in Appendix A.

4.4 Subjects

The subjects of this experiment were recruited from a university in southern China, not having amblyopia, strabismus, astigmatism or other eye diseases. If one had myopia, it was under 350 degree. A total of 57 subjects participated in this study, with 70.2% being female, 73.7% being undergraduates, an average age of 22.5, and an average online shopping frequency of 3.98 times a month. 57 subjects were randomly assigned to 4 groups with different levels of product information presentation and seller reputation. Specifically, each group had 14 subjects except a group of low seller reputation × common product information presentation which had 15 subjects. No significant differences were found across the 4 treatment conditions regarding gender, age, education and online shopping frequency, thus, random grouping was valid. All the subjects were paid to participate in this experiment.

4.5 Experiment procedures

We conducted a pilot experiment before the formal experiment. Four participants took part in the pilot experiment. Thus, we can stylize the experiment processes and guarantee the appropriateness of the experiment settings. In the formal experiment, participant first read and sign an informed consent form for the eye-tracking experiment, then read the experimental task instruction as "You are supposed to buy a laptop (Lenovo Z470A-ITH(T)) and an electronic dictionary (GGV E638) mainly for daily study and entertainment. Now, you are searching for an appropriate seller on Internet. You have enough money. Please scan a website provided by a laptop seller with the shopping task. Then finish a questionnaire. You can watch the page as you like. If you are ready to make a shopping decision, please click "Exit" to finish this task".

The formal experiment was conducted in a sound-proof and dimly-lit laboratory. Participants were calibrated with the eye-tracker before browsing the webpages, which took about 3 minutes on average. After the calibration, subjects began to browse the webpages. Each subject browsed two webpages with the same level of product information presentation and seller reputation and different product types. Subjects browsed two webpages in random order to avoid the latent order effects. While viewing the pages, subjects' eye movement data were recorded by eye tracker. After viewing each page, subjects were asked to fill in a questionnaire.

4.6 Questionnaire design

The questionnaire used the 7-point Likert scale from 1 (completely disagree) to 7 (completely agree). All constructs in the questionnaire were measured by using or adapting previously developed and validated scales. The measures of trust towards seller was based on Mavlanova and Benbunan-Fich (2010). The measures of perceived product presentation were adapted from Gregg and Walczak (2008) and Mavlanova and Benbunan-Fich (2010). Product PII was adapted from Zaichkowsky (1994). Perceived product quality were adapted from Wells et al. (2011) , Mavlanova and Benbunan-Fich (2010). Purchase intention was adapted from Wells et al. (2011).

5 DATA ANALYSES AND RESULTS

5.1 Analysis of reliability and validity

The main data analysis method used here is Structural Equation Modelling (SEM), and the results of SEM are supplemented by the analysis of eye-tracking data. The variance-based PLS (Partial Least Squares) method was chosen for structural equation modelling and SmartPLS 2.0. was used to analyse the questionnaire data. Composite Reliability (CR), Average Variance Extracted (AVE) and Cronbach's alpha are used as indicators to test construct reliability in PLS. The Cronbach's alpha for each construct is higher than the recommended level of 0.70 (Rivard & Huff 1988). The composite reliability of all the latent variables is higher than the recommended level of 0.60 (Bagozzi & Yi 1988). The average variance extracted (AVE) value for each construct is higher than the recommended level of 0.50 (Bagozzi & Yi 1988). All of these results indicate good reliability.

All of the measurement items load on their respective factors with strong statistical significance ($p<0.01$), indicating good convergent validity. In addition, the variance-extracted test was used to establish discriminant and convergent validity. Validity is demonstrated if the square root of the AVE of each construct is higher than the correlations between it and other constructs (Fornell & Larcker 1981). The results indicate good convergent and discriminant validity. Therefore, our instrument encompassed satisfactory construct reliability and construct validity.

5.2 Manipulation checks

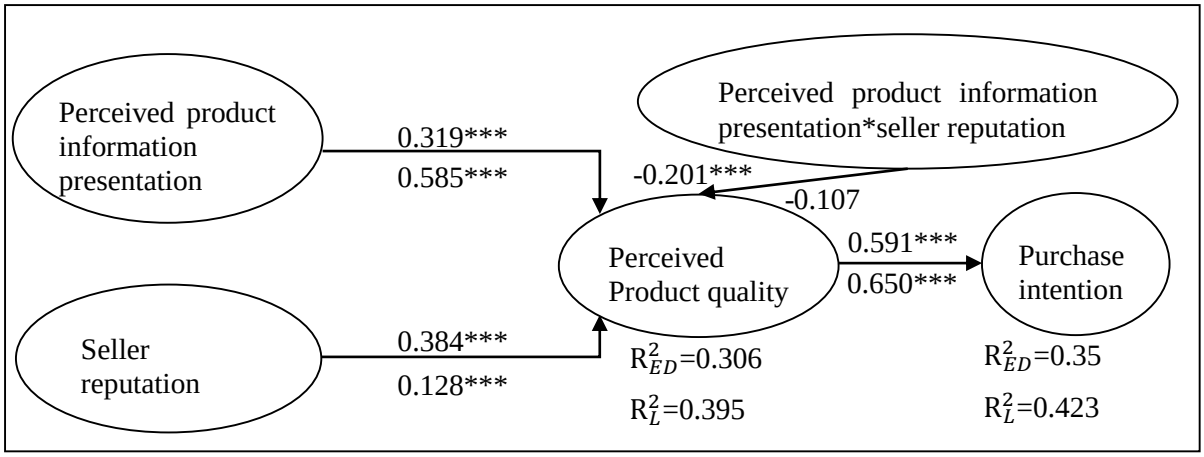
Manipulation check for product information presentation was conducted with an independent sample T-test. The results showed a significant difference (t=-2.06, P=0.042) on perceived product presentation between common product information presentation (M=3.52, SD=1.18) and advanced product information presentation (M=4.01, SD=1.37).

It is confirmed in prior research that seller reputation has an impact on consumers' trust towards seller, attitudes and further intentions and behaviour (Money & Hillenbrand 2006). Thus, manipulation check for seller reputation was conducted by 5 items regarding subjects' trust, attitudes, and behavioural intentions toward the seller. An independent sample T-test was conducted, which showed a significant difference (t=-5.90, P=0.00) between low seller reputation (M=3.67, SD=0.97) and high seller reputation (M=4.71, SD=0.93).

An independent sample T-test was performed, which showed a significant difference (t=-8.75, P=0.00) between low-involvement product (M=3.87, SD=1.42) and high-involvement product (M=5.97, SD=1.12). Thus, the manipulations of product information presentation, seller reputation and product involvement were valid.

5.3 Test for research model

The results of the PLS analysis of the research model are presented in Figure 2. Bootstrapping procedures were performed to determine the path coefficients and the statistical significance of each hypothesized path, with the bootstrap resampling set at 500. Seller reputation entered the model as nominal variables (0 refers to low, 1refers to high), this is plausible in PLS modelling (Henseler & Fassott 2010) and has been adopted in previous research (Cyr et al.2009). In the Figure 2, R^2_{ED} refers to R^2 value from the electronic dictionary case; R^2_L refers to R^2 value from the laptop case. The results show that H1, H2, H4, H5 are supported and H3 are patially supported. 30.6% of the variance of perceived product quality was interpreted by the constructs in the model, 35% of the variance of purchase intention was interpreted by the constructs in the model for electronic dictionary case; 39.5% of the variance of perceived product quality was interpreted by the constructs in the model, 42.3% of the variance of purchase intention was interpreted by the constructs in the model for laptop case. This meant the model had preferable predication performance.



Note: Values above the arrows refer to path coefficients from the low involvement product (electronic dictionary) case; values below the arrows refer to path coefficients from the high involvement product (laptop) case.

Figure 2. The result of PLS analysis

5.4 Eye-movement data analysis

The fixation on pages or information areas usually indicates a deep cognitive information process of the individual (Pan et al. 2004). This study made a comparison of subjects' fixation indicators on product information area under different conditions, aiming to know whether the degree of attention subjects paid to the product presentation information and the degree of complexity of information process change when seller reputation and product PII are at different levels. Detailed product information area was considered as an area of interest (AOI). Fixation time and fixation counts were used to measure the attention paid by the subjects.

Table 4 showed the means and standard deviation of fixation counts and fixation time when subjects performed task on webpages under different seller reputation and product information presentation. MANOVA analysis on fixation counts and fixation time was conducted and the results were presented in Table 5. We can see that the main effects of product information presentation are significant, and the interaction effect of seller reputation and product information presentation is significant ($p<0.05$) only for electronic dictionary case.

		M (SD)	
	Seller reputation	Product information presentation	
		Low-level	High-level
Fixation counts (electronic dictionary)	Low	76.27 (29.175)	183.07 (117.145)
	High	90.36 (51.196)	115.86 (33.723)
Fixation counts (laptop)	Low	132.33 (75.709)	328.93 (198.401)
	High	129.86 (63.753)	299.07 (161.375)
Fixation time (s) (electronic dictionary)	Low	1.895589E4 (8.3154261E4)	4.095256E4 (2.5349173E4)
	High	2.563546E4 (1.5826194E4)	2.579971E4 (7.2256974E4)
Fixation time (s) (laptop)	Low	3.393761E4 (2.0413734E4)	7.644866E4 (4.9564374E4)
	High	3.528560E4 (1.786409E4)	6.950484E4 (4.5922073E4)

Table 4. Descriptive statistics of fixation indicators

	Fixation counts (laptop)	Fixation time (s) (laptop)	Fixation counts (electronic dictionary)	Fixation time (s) (electronic dictionary)
Seller reputation	F=0.201 p=0.656	F=0.085 p=0.771	F=2.226 p=0.142	F=1.022 p=0.317
Product information presentation	F=25.671 p=0.000***	F=16.021 p=0.000***	F=13.806 p=0.000***	F=6.989 p=0.11*
Seller reputation * product information presentation	F=0.144 p=0.706	F=0.187 p=0.667	F=5.214 p=0.026*	F=6.783 p=0.012*

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

Table 5. MANOVA analysis results of fixation indicators

Figure 3~6 showed the estimated marginal means of fixation time and fixation counts in different treatments. From the figures, we can directly tell the interaction effect between seller reputation and product information presentation for electronic dictionary case. Specifically, subjects will pay less attention to product information presentation, namely the role of product information presentation will decrease when seller reputation is higher. However it doesn't apply to laptop case. Thus, H6 is partially supported.

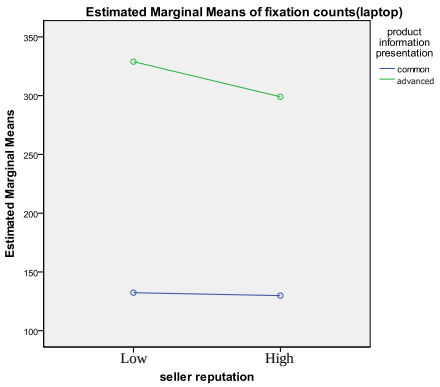


Figure 3. Marginal mean of fixation counts (laptop)

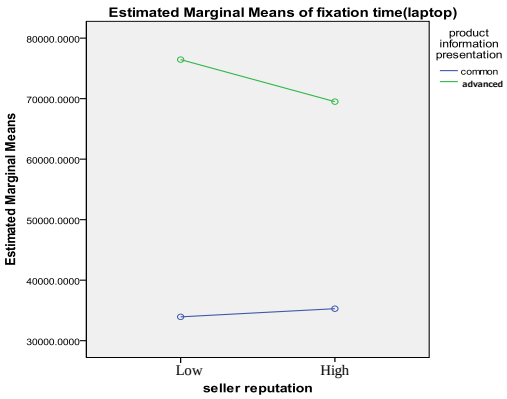


Figure 4. Marginal mean of fixation time (laptop)

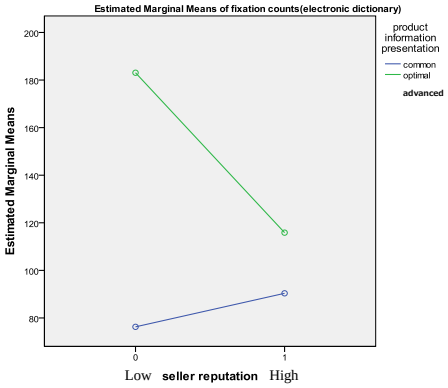


Figure 5. Marginal mean of fixation counts (electronic dictionary)

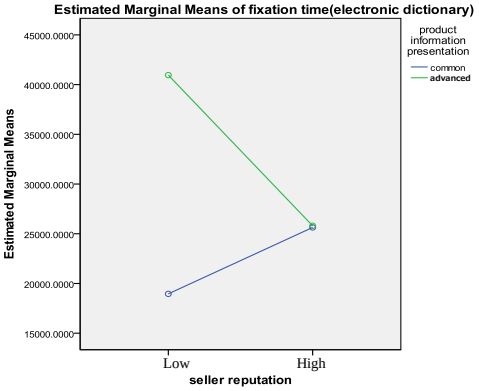


Figure 6. Marginal mean of fixation time (electronic dictionary)

6 DISCUSSION

6.1 Research findings

This study conducted a lab-controlled experiment to investigate the influence mechanism of product information presentation on consumers' perceived quality and purchase intention. The results show that perceived product information presentation may have a positive impact on consumers' perceived product quality, and thus to promote their purchase intentions. Specifically, based on the design of experiment treatments, advanced level of product information presentation has some characteristics including a group of pictures from different angles, an illustration of product attributes combining text and pictures, and a well-designed layout. The results of questionnaire analysis indicate that the subjects in condition of advanced product information presentation experienced a better display on the integrity, details and aesthetic of product information. And the superiority of perceived product information presentation finally induces a better perception on the quality and reliability of the products. The results of eye movement data analysis also give a support for this conclusion. Advanced product information presentation will catch consumers' attention better, which means a more sophisticated and deeper information process.

This study also found an interaction effect between perceived product information presentation and seller reputation. The influence of perceived product information presentation will decrease when seller reputation is high for a low involvement product. The results of eye movement data further indicated that seller reputation and product information presentation only made a significant interaction effect on fixations for low involvement product. As for a product with low involvement, consumers might be less willing to search for its product information, especially when the seller reputation is higher, the better consumers trust it, and the less they will rely on exhibited information in judgment of product quality; on the contrary, as for a product with high involvement, consumers require considerable information on it no matter how seller reputation ranges from low to high. In another word, the effect of seller reputation is weakened when it comes to products with higher involvement.

O'Cass (2000) regarded that consumers connect product with themselves to satisfy their psychological needs. As a result, a kind of product with high involvement means important, appealing to consumers which would impact the process of how they deal with the product information, for example, to search for related information actively. Thus consumer's demands for product information would be increased, and they might be more cautious to handle it at the same time. In other words, whether the way that product information presented could meet the needs of consumers, would strongly affect consumer's perception and cognition.

6.2 Theoretical contributions and practical implications

Most prior research focused on seller-related factors to improve the online consumers' trust and reduce seller uncertainty, ignoring the role of product-related information. In recent year, some researchers have conducted empirical studies to investigate the impact of online product presentation on customers' perceived website diagnosticity (Jiang & Benbasat 2007), mood, perceived risk, and purchase intention (Park et al, 2005) and user perceptions of the authenticity of products (Mavlanova & Benbunan-Fich 2010) etc. However, there is a lack of research focusing on the joint effects of seller-level information and product-level information. Mavlanova et al. (2010) examined online product characteristics (i.e. product presentation) and seller characteristics (i.e. seller trust signal) in the context of counterfeit deception and online trust, but they didn't focus on the interaction effect between them as well as the moderating role of product involvement. So very few studies discuss the moderating role of product involvement at different levels of product information presentation and seller reputation with regard to perceived product quality. This study examined the impact of perceived online product presentation and seller reputation on perceived product quality and purchase intention under different levels of

product involvement and found the moderating role product involvement. We did not only prove perceived product information presentation can be a signal to affect consumers' perception of the quality and their willingness to buy it, but also indicate the different role of product information presentation in different online context. This work has thus contributed to the extent literature by providing a theoretically grounded understanding of how product involvement affects the relationship between perceived product information presentation, seller reputation, and perceived product quality and purchase intention. So this study will lead to a more comprehensive understanding of online customers' behaviour.

Another contribution of this study is about research methodology. Most related research about online shopping has used questionnaires as the most popular data collection method. This study adopted a multi-method approach combined questionnaire with eye-tracking method. Through the analysis of the eye-tracking data, we can represent the information process and attention of users more finely and objectively. The analysis results of eye-tracking data provided a supplement and validation for the test results of the research model. This research is also an instructive attempt for a multi-method approach.

The findings of this study have important practical implications for Internet retailers. According the results, we can presume that in the online consumption environment with information asymmetry, detailed, real and artistic presentation of product information can make products more touchable, thus to contribute to consumers' judgment of the quality. Besides, in terms of those beginner sellers with little reputation, an outstanding product information demonstration is of great concern. As for the sellers selling products with high involvement product in the online market, to present their product information in a better way might contribute to attracting consumers and meeting their needs for information.

6.3 Limitations and Future Research

We have conducted a preliminary study on the joint effects of sell-level factors and product-level factors. There are some limitations to this research and further research is necessary in the future. First, although the sample size used in this research met the recommended thresholds for PLS analysis, the sample size in this study is relatively small. Second, previous research about the presentation of online product lacks systematic induction, and this study tried to form a preliminary construct of perceived product information presentation. But it was constrained by the experiment technology that multi-media was not integrated into this study. It is necessary for future research to dig more deeply into the features of product information presentation and the construct of perceived product presentation. Finally, we only focused on electronic product. Other product types should be investigated in the future to explore product attributes that can affect customers' online behaviour.

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References

Aiken, K.D. and Boush, D.M. (2006). Trustmarks, objective-source ratings, and implied investments in advertising: Investigating online trust and the context-specific nature of internet signals. *Journal of the Academy of Marketing Science*, 34 (3), 308-323.

Andrews, J.C., Durvasula, S. and Akhter, S.H. (1990). A framework for conceptualizing and measuring the involvement construct in advertising research. *Journal of Advertising*, 19 (4), 27-40.

Bagozzi, R.P. and Yi, Y. (1988). On the evaluation of structural equation models. *Journal of the Academy of Marketing Science*. 16 (1), 74-94.

Biswas, D. and Biswas, A. (2004). The diagnostic role of signals in the context of perceived risks in online shopping: Do signals matter more on the web? *Journal of Interactive Marketing*, 18 (3), 30-45.

Bone, P. F. and France, K. R. (2001). Package graphics and consumer product beliefs. *Journal of Business and Psychology*, 15(3), 467-489.

Boulding, W. and Kirman, A. (1993). A consumer-side experimental examination of signaling theory: Do consumers perceive warranties as signals of quality? *Journal of Consumer Research*, 111-123.

Chang, T. and Wildt, A. R. (1994). Price, product information, and purchase intention: An empirical study. *Journal of the Academy of Marketing Science*, 22 (1), 16–27.

Cyr, D., Head, M., Larios, H. and Bing, P. (2009). Exploring human images in website design: a multi-method approach. *MIS Quarterly*, 33 (3), 539-566.

Dawar, N. and Parker, P. (1994). Marketing universals: Consumers' use of brand name, price, physical appearance, and retailer reputation as signals of product quality. *The Journal of Marketing*, 81-95.

Dimoka, A., Hong Y. and Pavlo P. (2012). On product uncertainty in online markets: Theory and evidence. *MIS Quarterly*, 36(X).

Djamasbi, S., Siegel, M. and Tullis, T. (2010). Generation Y, web design, and eye tracking. *International Journal of Human-Computer Studies*, 68 (5), 307-323.

Everard, A.P. and Galletta, D.F. (2005). How presentation flaws affect perceived site quality, trust, and intention to purchase from an online store. *Journal of Management Information Systems*, 22 (3), 56–95.

Fornell, C. and Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18 (2), 39-50.

Gregg, D.G. and Walczak, S. (2008). Dressing your online auction business for success: An experiment comparing two eBay businesses. *MIS Quarterly*, 32 (3), 653-670.

Henseler, J., and Fassott, G. (2009). Testing moderating effects in PLS path models: An illustration of available procedures. In V. EspositoVinzi, W. W. Chin, J. Henseler and H. Wang (Eds), Handbook of partial least squares: Concepts, methods, and applications, Berlin.

Jiang, J., Chen, Z. and Ren, J. (2011). Empirical study on the effects of perceived reputation on purchase willing in C2C electronic market. *Soft Science*, 25 (6), 130-134.

Jiang, Z. and Benbasat, I. (2007). Investigating the influence of the functional mechanisms of online presentations. *Information Systems Research*, 18 (4), 454-470.

Jiang, Z., Wang, W. and Benbasat, I. (2005). Multimedia-based interactive advising technology for online consumer decision support. *Communications of the ACM*, 48 (9), 92-98.

LaRose, R. (2001). On the negative effects of E-Commerce: A sociocognitive exploration of unregulated on-line buying. *Journal of Computer-Mediated Communication*, 6 (3), 0-0.

Mavlanova, T. and Benbunan-Fich, R. (2010). Counterfeit products on the internet: The role of seller-level and product-level information. *International Journal of Electronic Commerce*, 15 (2), 79-104.

Money, K. and Hillenbrand, C. (2006). Using reputation measurement to create value: An analysis and integration of existing measures. *Journal of General Management*, 32 (1), 1-12.

O'Cass, A. (2000). An assessment of consumers product, purchase decision, advertising and consumption involvement in fashion clothing. *Journal of Economic Psychology*, 21, 545-576.

Pan, B. H., Gay, H. G., Granka, L., Feusner, M. and Newman, J. (2004). The determinants of web page viewing behavior: An eye tracking study. In S. Spencer, editor, Proceedings of Eye Tracking Research and Applications. ACM, New York.

Park, J., Lennon, S. J. and Stoel L. (2005). On-line product information presentation: Effects on mood, perceived risk, and purchase intention. *Psychology and Marketing*, 22(9), 695-719.
Rivard, S. and Huff, S. L. (1988). Factors of success for end-user computing. *Communications of the ACM*, 31(5), 552-561.
Rao, A. R., Qu, L. and Ruekert, R. W. (1999). Signaling unobservable product quality through a Brand Ally. *Journal of Marketing Research*, 36 (2), 258-268.
Rao, A.R. (2005). The quality of price as a quality cue. *Journal of Marketing Research*, 8, 401-405.
Shapiro, C. (1983). Premiums for high quality products as returns to reputation. *Quarterly Journal of Economics*, 98 (4), 659-680.
Then, N. K. and DeLong, M. R. (1999). Apparel shopping on the web. *Journal of Family and Consumer Sciences*, 91, 65-68.
Utz, S., Kerkhof, P. and Bos, J. (2012). Consumer rule: How consumer reviews influence perceived trustworthiness of online stores. *Electronic Commerce Research and Applications*, 11, 49-58.
Wells, J. D., Valacich, J. S. and Hess, T.J. (2011). What signal are you sending? How website quality influences perceptions of product quality and purchase intentions. *MIS Quarterly*, 35 (2), 373-396.
Williams, T. and Larson, M. (2000). Creating the ideal shopping experience: What consumers want in the physical and virtual store. In Trustees of Indiana University-KPMG, Bloomington.
Zaichkowsky, J. L. (1985). Measuring the involvement construct. *Journal of Consumer Research*, 12, 341-352.
Zaichkowsky, J. L. (1994). The personal involvement inventory: reduction, revision, and application to advertising. *Journal of Advertising*, 13(4), 59-70.

Appendix A Experiment webpages

Figure A.1. Low seller reputation ×common product information presentation

Figure A.2. High seller reputation× common product information presentation

Figure A.3. Low seller reputation × advanced product information presentation

Figure A.4. High seller reputation × advanced product information presentation