Tailoring Persuasive Strategies in E-Commerce

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Abstract. E-commerce persuasive strategies are more effective when they are personalized. Using a sample size of 251 Amazon shoppers, we studied the effect of the persuasive strategies of the PSD framework on e-commerce customers based on 1) if they often review or rate products after purchase and 2) how long they have been customers of Amazon. Results of our analysis show that for the customers who often review and rate products, the system's effectiveness influence their decision to continue using Amazon, unlike the customers who have never reviewed or rated a product who are influenced by the perceived credibility of the system and the social support they receive from the system. In addition, the customers who have used Amazon for over five years are influenced to continue shopping with Amazon by the effectiveness of the system, unlike the new customers who are influenced by the social support they receive from the system.

Keywords: E-commerce, effectiveness, credibility, continuance intention

1   Introduction

The use of persuasive strategies has been identified as one means through which e-businesses can engage their existing clients and make new ones. Bearing in mind the many persuasive strategies that exist, identifying what strategies work best in a given context is important in order for them to be effective. In other words, the persuasive strategies have to be tailored to the individual. Research has shown that the demographics of customers can be used in creating a personalized experience for shoppers [1]. This paper examines the effect of the persuasive strategies of the Persuasive Systems Design (PSD) framework [2] on e-commerce consumers and what factors affect their intention to continue using the e-business. In particular, we are interested in studying the differences of the influence strategies on customers based on how often they rate and review products and on how long they have been clients of the e-business.

This paper builds on previous work of Adaji and Vassileva's [3][1] which evaluated Amazon as a persuasive system using the PSD framework and further identified the implementation of the persuasive principles of the PSD framework in Amazon.

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[1] Presented at the 2016 Personalizing Persuasive Technologies Workshop of the 2016 Persuasive Technology conference.

Using a sample size of 251 Amazon shoppers, in this study, we developed and tested four research models. Our results suggest that the likelihood of e-commerce consumers to be influenced by persuasive strategies differs significantly based on if they rate and review products and also on the duration for which they have been customers of Amazon. Though this study is work in progress, the results presented here can be useful to system developers in implementing personalized persuasive strategies that work in e-commerce.

2   Persuasive Systems Design Framework (PSD)

PSD is a systematic framework used for designing and evaluating persuasive systems. It details the content and design principles that are required in the development and evaluation of persuasive systems. The framework consists of 28 design principles that are categorized into four based on the tasks they aim to accomplish: 1) primary task support – principles in this category support a system's user in achieving their primary objective or goal, 2) dialogue support - design principles in this category support computer-human dialogue which provide feedback to users with the aim of moving users towards their target behavior, 3) system credibility support - principles in this category persuade users through the credibility of the system's design, 4) social support - the principles in this category influence users by leveraging social influence [4]. We used this framework in this study because despite its strengths, its use has not been extensively explored in the domain of e-commerce.

3   Research design and methodology

Our study was designed using the eight constructs adopted from previously validated scales of Lehto and Oinas-Kukkonen [5]. Six of these constructs were derived from the four categories of the PSD framework.

DIAL measures dialogue task support principles of the PSD framework. Dialogue support principles promote computer-human interaction that provides feedback to users, while moving them towards their target behavior [4]. Dialogue support in e-commerce is in the form of rating, reviews and communication between buyers and sellers [3]. PCRED, RCRED and SCRED measure system credibility support (of reviews, products and of the e-commerce system respectively) of the PSD framework. Because credible systems have been shown to be more persuasive [6], it is important to understand what principles one can adopt in designing a system that looks credible to the user. The principles in this category persuade users through the design of a system. PRIM measures the primary task support principles of the PSD framework. The persuasion principles in this category support a system's user in achieving their primary objective or goal [4]. SOCS measures the social support principles of the PSD framework. Social support principles influence users by leveraging social influence[4]. Social support benefits online consumers when making purchase decisions and has been found to critically affect users' future shopping intentions [7]. EFFE measures per-

ceived effectiveness which is related to performance expectancy. Perceived effectiveness is a measure of how consumers perceive the effectiveness of using technology in achieving their goal compared to other methods [5]. Based on this definition, we define perceived effectiveness in e-commerce, as a measure of how users perceive the effectiveness of the buying process from an e-commerce platform compared to the traditional brick and mortar store [5]. CONT measures the use continuance of an e-commerce customer. In other words, it measures if a client will continue shopping with the e-commerce vendor or not.

Using previously validated scales of Lehto and Kukkonen [5], dialogue support was measured with four items while primary task support, social support and perceived effectiveness were each measured with three items. Continuance was measured with two items while product credibility, review credibility and system credibility were measured with four items each. All items were measured on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree).

Participants in this study were Amazon shoppers and were recruited to participate in an online survey through Amazon's Mechanical Turk and various social media platforms. To meet the criteria of our study, we only selected participants that responded to the questions about how often they reviewed or/and rated products and how long they have been shopping with Amazon. Participants that selected the option "I prefer not to answer" were excluded. 251 participants met this criteria. Of these, 100 had never rated or reviewed a product on Amazon, while 151 sometimes reviewed and rated products after a purchase. In addition, 140 respondents had used Amazon for 5 years or less (we refer to these as new customers), while 111 respondents had used Amazon for over 5 years (we refer to these as existing customers). Note that this naming convention is only to differentiate between the groups.

4 Result

In this section, we provide the results of our study. This includes the validation of our instruments, evaluation of global measurements and the results of our multi group analysis.

4.1 Measurement validation

In order to determine the validity of our survey instrument, we performed Principal Component Analysis (PCA) using SPSS. In order to do so, we determined the Kaiser-Meyer-Olkin (KMO) sampling adequacies to be >.70 and the Bartlett Test of Sphericity to be significant at $p<.0001$.

4.2 Evaluation of global measurements

According to Wong [8], it is important to determine the reliability and validity of the latent variables in order to complete the examination of the structural model using var-

ious reliability and validity items such as indicator reliability, internal consistency reliability, convergent validity and discriminant validity. All indicators in our measurement model had outer loadings greater than 0.7, the minimum acceptable level [9]. Hence, indicator reliability criteria was met. The composite reliability values for all latent variables were higher than the acceptable threshold of 0.7 [8], hence high levels of internal consistency reliability were established among all latent variables. The Average Variance Extracted (AVE) was computed to determine the convergent validity of each latent variable. All AVE values were greater than 0.5, the acceptable threshold [9]. Hence, convergent validity was confirmed. For each latent variable, the square root of AVE was greater than the other correlation variables, hence, discriminant validity was also established.

4.3   Multi-Group Analysis

In order to determine if there is any significant difference in the susceptibility to the persuasive strategies of the PSD framework between product raters/reviewers and none reviewers and also between old and new Amazon customers, we carried out a multi group comparison based on the groups described below using SmartPLS.

Group1. Product reviewers/rates vs non product raters/reviewers.
This group was derived based on how often (or not) customers rate or review products after a purchase. We developed two models, one for the customers that often rate or review products and the other for the customers who never review or rate products after making a purchase. Table 1 shows the result of the multi group analysis that was carried out between the two models in this group, in particular, it shows the path coefficients between the constructs (described in section 3) and the significance of these path coefficients.

Table 1. Path coefficients and significance of the models for reviews and non-reviewers

PATH	Reviewers/ Raters	Non- Reviewers/Raters	Between Group significance
DIAL → PCRED	0.483	0.429	n.s
DIAL → PRIM	0.717	0.639	n.s
DIAL → RCRED	0.480	0.352	n.s
DIAL → SCRED	0.204	0.195	n.s
DIAL → SOCS	0.504	0.166	<0.001
EFFE → CONT	0.638	0.380	<0.001
PCRED → SCRED	0.300	0.643	<0.01
PRIM → EFFE	0.302	0.463	n.s
RCRED → SCRED	0.482	0.080	<0.001
SCRED → CONT	0.090	0.300	<0.05
SOCS → CONT	0.038	0.260	<0.05
SOCS → EFFE	0.495	0.373	n.s

DIAL = Dialogue support, SOCS = Social support, PRIM = Primary task support, EFFE = Perceived effectiveness, CONT = Continuance intention, PCRED = Perceived product credibility, RCRED = Perceived review credibility, SCRED = Perceived system credibility. n.s. = not significant

The results from the models show that both customer groups (those who rate/review products and those who do not) differ with respect to the influence of the persuasive strategies. While the magnitude of influence of dialogue (DIAL) on social support (SOCS) is higher for the customers who often review and rate products, it is significantly lower for the customers who never review or rate products. In addition, the influence of the effectiveness (EFFE) of the e-commerce system on the use continuance (CONT) of the customers significantly differs between the regular reviewers/raters and the non-reviewers/raters.

Group2. New vs Existing Customers.
We also grouped customers according to how long they have been using Amazon, with new customers being those that have used Amazon for five years or less, and existing customers being those that have used Amazon for over 5 years. We used 5 years based on the average time participants claim they have been customers of Amazon. We then developed two models for this group for new and existing customers. Table 2 shows the result of the multi group analysis that was carried out between the two models in this group, in particular, the path coefficients between the constructs and the significance of these path coefficients.

Table 2. Path coefficients and significance of the models for new and existing customers.

PATH	New Customers	Existing Customers	Between Group significance
DIAL → PCRED	0.558	0.375	<0.05
DIAL → PRIM	0.693	0.685	n.s
DIAL → RCRED	0.548	0.357	<0.05
DIAL → SCRED	0.205	0.250	n.s
DIAL → SOCS	0.355	0.433	n.s
EFFE → CONT	0.444	0.665	<0.001
PCRED → SCRED	0.482	0.352	n.s
PRIM → EFFE	0.328	0.445	n.s
RCRED → SCRED	0.225	0.419	<0.001
SCRED → CONT	0.149	0.210	n.s
SOCS → CONT	0.194	-0.013	<0.05
SOCS → EFFE	0.458	0.414	n.s

DIAL = Dialogue support, SOCS = Social support, PRIM = Primary task support, EFFE = Perceived effectiveness, CONT = Continuance intention, PCRED = Perceived product credibility, RCRED = Perceived review credibility, SCRED = Perceived system credibility. n.s = not significant

The results from the models show that both customer groups, new and existing customers, differ with respect to the influence of the persuasive strategies. While the magnitude of influence of dialogue (DIAL) on product (PCRED) and review credibility (RCRED) is higher for the new customers, it is significantly lower for the existing customers. In addition, the influence of the effectiveness (EFFE) of the e-commerce system on the use continuance (CONT) of the customer significantly differs between the two customer groups.

5   Discussion

In this study, we created four theoretical models to explore the factors that affect the perceived effectiveness, credibility and use continuance of e-commerce shoppers in various groups. In the first group, we studied users based on their participation in product reviews. It was expected that perceived review credibility significantly influenced the perceived system credibility of the customers who often take time out to review and rate products. This could be because they believe that, like them, other customers provide credible reviews, hence the system should be credible. This finding is in line with previous studies that have found that the reviews on an e-commerce site have an impact on the trust a consumer places on such a company, and this directly impacts the purchasing intention of the customer [10], [11]. It was interesting to find that between the reviewers/raters and non-reviewers/raters, the determinant of use continuance was significantly different. For the customers who often review and rate products, the system's effectiveness influenced their decision to continue using Amazon, unlike the non-reviewer/raters who were influenced to continue using Amazon by the perceived credibility of the system and the social support they receive from the system.

In the second group, we studied users based on how long they have been customers of Amazon. The influence of dialogue support on perceived system credibility was significantly higher for the new customers compared to existing customers. In addition, dialogue support also significantly influenced the perceived credibility of reviews for new customers. For existing customers, the effectiveness of the system influenced their decision to continue using Amazon. In contrast, new customers were influenced to continue shopping on Amazon by the social support they received. The implications for web developers and e-business owners include the following:

- Selecting persuasive strategies based on the consumers' participation in reviews and how long they have been customers could lead to a better personalized experience for the customer.
- Being able to interact with other customers is essential for new customers, hence e-commerce sites should integrate internal social networks on their platforms where customers can interact.
- E-businesses should ensure their processes remain effective in order to maintain their existing customers.

Our study is limited in the spread of data between the two groups we studied; we did not have equal number of participants for reviewers/raters and non-reviewers/raters. The same applies to new and existing customers. We are still collecting data from the study and we hope to have similar number of participants in future studies.

6   Conclusion

We studied the influence of the persuasive strategies of the PSD framework on e-commerce customers' based on 1) if they often review or rate products after purchase and 2) how long they have been customers of an e-business. We built on a previous study

[3] where Amazon was evaluated as a persuasive system using the PSD framework. Using Amazon as a case study and a sample size of 251 Amazon shoppers, in the current study, we developed and tested four models using partial least-squares structural equation modelling (PLS-SEM) analysis.

The results of our analysis show that for the customers who often review and rate products, the system's effectiveness influenced their decision to continue using Amazon, unlike the non-reviewers/raters who were influenced to continue using Amazon by the perceived credibility of the system and the social support they receive from other users of the system. The influence of dialogue support on perceived system credibility was significantly higher for the new customers compared to existing customers. Furthermore, dialogue support significantly influenced the perceived credibility of reviews for new customers. For existing customers, the effectiveness of the system influenced their decision to continue using the platform, unlike the new customers who were influenced by social support to continue using the system.

Though this research is work in progress, the results achieved so far can be useful to e-commerce owners and developers in implementing effective personalized persuasive strategies.

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