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**Task facilitative tools, choice goals, and risk averseness:**

**A process-view study of e-stores**

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## **Abstract**

Although the effects of interactivity and personalization tools on the browsing experience are the subject of previous research, relatively little research focuses on the effect of variable levels of such features on buyers' evaluations of choice goals. To address this gap, this study conducts an experiment with 273 participants to examine these relationships in the context of complex, high-risk purchase situations where the seller is new to the market and buyers demonstrate variable risk averseness. Findings identify a positive association between website design features and browsing outcomes. The study provides direction on determining the combination of website features according to buyer characteristics.

**Keywords:** Personalization; interactivity; evaluation costs; choice goals; website design; risk averseness

## 1. Introduction

A key challenge for internet-based retail start-ups is how to make their e-store a destination for customers, encourage them to browse the site for longer, and increase the probability of purchase (Wang et al., 2010). A recent industry report suggests that the browser-to-buyer conversion rate is as low as 3% for e-stores (Marketing Sherpa, 2012). New e-retailers that enter into the electronic marketplace every day find this situation more challenging because such e-retailers have limited product offerings, have no established brand image from their previous ventures, and customers do not know them. Research suggests that e-retailers often use two task-facilitative tools (interactivity and personalization) to assist browsers to access information about the product/service they intend to purchase, perform the task of assimilating this information and take necessary purchase decisions.

Interactivity tools assist browsers to communicate with the seller and engage in information search (Kim et al., 2012; Liu & Shrum, 2009; Song & Zinkhan, 2008). Personalization tools allow browsers to tailor the information and content of the website according to their requirements (Aguirre et al., 2015; Al-Qeisi et al., 2014; Ansari & Mela, 2003). As new-to-market e-retailers often have limited resources to spend on brand building activities, adopting these tools to enhance the stickiness of their website is crucial in establishing a relationship with the prospective buyers. The literature on information control emphasizes that the effectiveness of such tools depends on their ability to help users with their information search, assimilation of information, evaluation of choices, and decision making (Ariely, 2000; Heitmann et al., 2007). Hence, presenting an array of decision-making tools regardless of individual user's requirements might create information overload, a sense of frustration, doubt about the seller's assistive intent, and higher evaluative cost of decision-making (Gupta et al., 2009; Heitmann et al., 2007). However, little research explores how task-facilitative tools can influence prospective buyers' evaluation costs.

Research on consumer choice processing proposes that consumers try to achieve a hierarchy of goals when making their product selections (Bettman et al., 1998; Heitmann et al., 2007). This work classifies goals as either approach goals where the consumers try to maximize the accuracy of their choice (choice confidence) and ease of justification in decision-making (justifiability) or avoidance goals where customers try to minimize the experience of negative emotions (negative affect) and anticipation of regret in decision making (anticipated regret). Although retail research highlights the role of such goals in post-purchase behavior such as spending more money or less money with the store (Arnold & Reynolds, 2012), little research focuses on choice goals in the e-retail setting and particularly in the pre-purchase stage of decision making.

Gupta et al.'s (2009) work on information search argues that the effectiveness of task-facilitative tools depends on buyers' characteristics such as their ability to grasp the nuances of such features, their experience of using web design tools, and their involvement with the product type. As a result, presenting a wide selection of design tools might be beneficial for some users and a source of hindrance to others. However, in the case of a new or unfamiliar e-retailer, simply offering a balanced mix of task-facilitative tools to reduce the users' choice-evaluation costs is not enough because users might find better alternatives from more established and well-known e-stores. Therefore, understanding the potential impact of an individual's risk averseness on the effects of these tools is also important for the e-retailer to attract first-time users and encourage them to navigate their site.

Therefore this study has three objectives: (1) to understand the role of task-facilitative design tools (interactivity and personalization) on users' choice-evaluation costs for new-to-market e-retailers; (2) to understand how user's choice-evaluation costs might influence approach or avoidance goal orientations in the pre-purchase decision-making phase; and (3) to explore the moderating role of users' risk

averseness on the relationship between task-facilitative tools and users' choice-evaluation costs. To explore these objectives, this research uses an experimental setup where users experience e-stores with varying levels of interactivity and personalization tools and pursue a specific task of choosing a high-involvement product to purchase. Following this introduction, section 2 reviews the literature and develops the hypotheses. Section 3 describes the research method. Section 4 presents the findings. Section 5 offers a discussion of the findings together with their implications, limitations, and suggestions for future research.

## **2. Literature review and hypotheses development**

A website requires a significant level of investment and effort to support the buying decision-making process (O'Keefe & McEachern, 1998). This study focuses solely on how interactivity and personalization tools that firms make available to users can facilitate information search and evaluation during the pre-purchase stage of this process for first-time browsers. Both types of tool attract the attention of researchers from marketing, human-computer interaction, and information systems disciplines (Chung & Zhao, 2004).

Figure 1 presents a model to help to explain how interactivity and personalization tools affect browsing outcomes of first-time visitors of a new-to-market e-store. The model is based on Mehrabian and Russell's (1974) Stimulus-Organism-Response (S-O-R) paradigm. The authors develop this paradigm originally in environmental psychology to study the effects of physical stimuli on human emotions and response behaviors, whereas other authors subsequently apply the paradigm in a retailing context to examine the effects of store atmosphere on shopping behavior (Donovan & Rossiter, 1982). More recently, several researchers adopt this paradigm to examine the effects of online website stimuli on consumer behavior (Eroglu et al., 2001; Richard, 2005; Wang et al., 2010). Figure 1 suggests that

interactivity and personalization tools (i.e. stimulus) can influence cognitive and affective internal states during pre-purchase decision making (i.e. organism), which in turn influence their goal orientation in terms of approach or avoidance behaviors towards the e-store (i.e., response). The next section provides justification for this model.

Figure 1 here.

Task-facilitative tools influence the way users evaluate the information and make their product choice. Higher levels of web-design tools signify a higher perceived investment from the e-retailer, which induces a superior trusting belief towards the e-store (Schlosser et al., 2006; Gupta et al., 2009). Song and Zinkhan (2008) propose that higher levels of web design features improve user satisfaction and attitude towards the website. Therefore, this study argues that higher levels of interactivity and personalization tools act as decision aids, improve the seller's intention to assist in users' decision-making and reduce their choice-evaluation costs.

H1a: The presence of website-design features that offer a high level of interactivity (as compared to a low level) reduces users' choice-evaluation costs.

H1b: The presence of website design features that offer a high level of personalization (as compared to a low level) reduces users' choice-evaluation costs.

Next, novice e-retailers must foster a sense of decision satisfaction among browsers, which will depend on the attainment of choice goals (approach versus avoidance goals) and the choice set that the seller provides (Heitmann et al., 2007). Markman and Brendl (2000) define goals as "representational structures that guide the system in its pursuit of a reference or end state" (p. 98). According to theories of regulatory self-focus, when people compare their current state with their end state and identify a gap between these states, they seek to resolve this discrepancy by approaching desired end states and avoiding undesired ones (Higgins, 1998). Although an individual's

regulatory focus can reflect a personality trait, this study focuses solely on its representation as a situational feature. Higgins' (1998) observation of the analysis of desired goals in terms of goals that focus on attaining positive outcomes (promotion goals) and those that focus on avoiding negative outcomes (prevention goals) offers a novel way for predicting consumers' behavior when they are evaluating products or making purchasing decisions. Building on the notion of 'regulatory fit', which individuals experience when their focus is compatible with the information that they have to process, resulting in a rise in processing capacity (Higgins, 2000), Werth and Foerster (2007) emphasize that an individual's regulatory focus affects not only motivation but also information processing.

Nevertheless, considering the evaluative costs of consumers' decision-making is important because individuals will attempt to save energy and invest less efforts in evaluating alternative choices (Anderson, 2003). This study argues that promotion-focused users are likely to have an orientation toward attaining positive outcomes (approach goals) when they experience lesser evaluation costs, whereas prevention-focused users are likely have an orientation toward avoiding negative outcomes (avoidance goals) when they experience lesser evaluation costs.

H2a: Lesser choice-evaluation costs leads to higher approach goals.

H2b: Lesser choice-evaluation costs leads to lower avoidance goals.

Finally, an individual user's risk averseness influences the extent of information search he or she is likely to engage in to minimize the potential regret in purchase decisions (Cho, 2006). Therefore, individuals with greater risk averseness are likely to use the full extent of the task-facilitative tools available to them to facilitate information search and evaluation. This study argues that such users are likely to perceive higher evaluation costs due to the complexity of the design tools.

H3a: The positive association between the provision of website design features, which offer a high level of interactivity (as compared to a low level), on users' choice-evaluation costs will be higher for more risk-averse users as compared to less risk-averse users.

H3b: The positive association between the provision of website design features, which offer a high level of personalization (as compared to a low level), on users' choice-evaluation costs will be higher for more risk-averse users as compared to less risk-averse users.

### **3. Method**

#### *3.1. Participants*

273 students of a large British university participated in the experiment. This study recruited students using electronic flyers sent through email in return for a modest shopping voucher and chose students for several reasons. First, to conduct an experiment, the sample should be largely homogeneous. These participants were similar in terms of age, education, Internet expertise and online-shopping experiences. Second, the study used laptop computers as the product context. Students in the sample were highly familiar with the usage and technical details of this product category. Also, the use of a student sample in online experiments involving a technology purchase is prevalent in the literature (Gupta et al., 2009). The sample was 63% female, mostly in the age group between 20–24 years, and with income less than £20,000 per annum. 73% of the participants were undergraduates. About 90% of them had been using the Internet for more than five years, 60% had spent more than 15 hours online every week, 45% had bought more than six products online in the previous six months, and 34% had already purchased computer hardware/software online.

#### *3.2. Design and procedure*

This study conducted an online experiment (in a computer lab setting) employing a 2 (interactivity: high versus low) by 2 (personalization: high versus low) by 2 (risk averseness: high versus low) between-subjects experimental design to test the hypothesized relationships. The study manipulated the levels of interactivity and personalization tools of the website in the experiment, but the level of risk averseness, being an individual trait, was measured using an established scale.

The objective of the research was to understand the effects of task-facilitative tools on browsers of a new (or unknown) e-store. This research employed a professional design agency to develop four versions of a hypothetical e-store (called LaptopMadness.com) selling laptop computers, which displayed images of laptop brands, technical specifications, prices, customer services, and warranty policies adopted from real-life e-stores. Using this method, this study manipulated the level of the two task-facilitative tools (i.e. interactivity and personalization) to measure their effect on the three outcomes (i.e. evaluation costs, approach and avoidance goals). These manipulations of the e-store interface draw on literature (Table 1), insights from professionals, and real-life e-stores selling laptops.

Table 1 here.

Otherwise, the range of products offered on each version of the website was identical. The sample sizes for individual cells were as follows: high interactivity, high personalization n= 70; high interactivity, low personalization n= 66; low interactivity, high personalization n= 69; low interactivity, low personalization n= 68.

Once respondents signed up online to take part in the study, the second step consisted of randomly assigning them to one of four pre-tested conditions (having already undertaken manipulation checks to ensure that the different levels of personalization and interactivity were noticeable). The procedure considers even distribution of the sample across the four experimental conditions. First, the participants completed a series of pre-experiments

concerning prior Internet experience, product category involvement, product category knowledge, and attitude towards online shopping. Next, the participants received a website address for their assigned condition of the fictitious e-retailer and had 5 minutes for browsing. During the next 15 minutes the participants performed a goal-directed task, consisting of making a laptop purchase selection from the product range on offer at the e-store. Finally, they answered a series of questions about this experience.

### 3.3. *Measures*

The key constructs in the experiment drew from existing measurement scales with all responses collected using a seven-point Likert scale. Heitmann et al.'s (2007) scale measured choice-evaluation costs, approach goals (comprised of choice confidence and justifiability) and avoidance goals (comprised of anticipated regret and final negative affect). A scale developed by Cho (2006) served to measure risk averseness.

## 4. **Findings**

This research uses median split to categorize browsers into high and low risk-averse users. Table 2 provides the construct correlations. In addition, the study uses composite means of individual constructs to represent the two choice goals (Heitmann et al., 2007).

Table 2 here.

The study used hierarchical regression to test the hypotheses. Table 3 explains the results, which show significant relationships between the constructs. Model 1 shows that a higher level of interactive features reduces user choice-evaluation costs ( $\beta = -0.53, p < 0.05$ ). This result supports H1a. Model 1 also shows that a higher level of personalization features reduces users' choice-evaluation costs ( $\beta = -0.35, p < 0.05$ ), thus supporting H1b. Model 2 shows that lower evaluation costs lead to higher approach goals ( $\beta = -0.41, p < 0.01$ ), thus

supporting H2a. Model 2 also shows that lower evaluation costs lead to lower avoidance goals ( $\beta = 0.70$ ,  $p < 0.01$ ). This result supports H2b.

The interaction term between the task-facilitative tools and users' risk averseness tests the moderation effect. Model 1 shows that a significant interaction exists between interactivity tools and users' risk averseness ( $\beta = 0.56$ ,  $p < 0.05$ ). An examination of the means shows that high levels of interactivity lead to higher levels of reduction of evaluation costs for more risk-averse users as compared to the less risk-averse users (mean for high risk-averse users = 3.11, mean for low risk-averse users = 5.35,  $p < 0.05$ ; a higher value represents higher evaluation costs). This result supports H3a. However, the results show that no significant interaction exists between personalization and users' risk averseness ( $\beta = 0.10$ , not significant). This result does not support H3b.

Table 3 here.

## **5. Discussion and conclusion**

The results indicate that an unfamiliar, new-to-market e-retailer can significantly reduce users' evaluation costs by offering higher levels of task-facilitative design tools for interactivity and personalization in the pre-purchase decision-making stage. This procedure in turn can improve their subsequent response (approach or avoidance behaviors) toward the e-store. The study also shows that the effectiveness of interactivity and personalization tools is greater for high risk-averse buyers. The results have significant research and practice implications.

### *5.1. Theoretical implications*

The study contributes to the growing literature on the effects of task-facilitative information tools on browsing experience and decision-making in two ways. Past research

(Aguirre et al., 2015; Kim et al., 2012; Song & Zinkhan, 2008) largely focuses on the influence of task-facilitative tools (interactivity and personalization) on various aspects of decision-making such as consumer trust or purchase intent in isolation. However, a real-life e-store uses both of them in conjunction to increase the stickiness of the website by lowering choice-evaluation costs of prospective buyers. This study contributes to this literature by employing the S-O-R paradigm as the backdrop to show the joint effects of the two tools on prospective buyers' responses during the pre-purchase decision-making stage for new-to-market e-retailers.

This research also used the regulatory-focus theory to explore the influence of the moderating effects of buyers' risk averseness on their approach and avoidance-choice goals. Past research (Arnold & Reynolds, 2012; Heitmann et al., 2007) largely focuses on existing buyers' responses toward choice goals or in a hedonic-consumption context. This study extends this literature strand by focusing on prospective buyers' choice goals in a very task-oriented context. This approach is important because the significance of task-facilitative tools is likely to be higher for prospective buyers when they encounter information overload in making a purchasing decision for high risk, technology intensive products (like laptops).

## 5.2. *Managerial implications*

This research also makes a significant contribution to practice. Use of advanced tools for personalization (such as comparing products, ability to filter brands) and interactivity (such as buying guide, jargon buster) for decision-making requires intensive product knowledge. Buyers' willingness to use such tools to assimilate knowledge about the e-store depends on their motivation to process information and evaluate options. Thus, the context of a complex product purchase (such as a laptop) involving high purchase risk

from an unknown e-retailer is particularly suitable for the implementation of such advanced website-design features. A key implication of the study is that new-to-market e-retailers can compete against more established e-stores by offering prospective buyers better tools for decision-making. The provision of these tools will improve their confidence not only in an unknown seller but also in making the correct product choice.

The results also indicate that high risk-averse users, relative to low risk-averse users, use advanced interactivity tools and make an effort to understand and use them for complex decision-making situations that involve high purchase risk. Using site-centric clickstream data, managers can categorize buyers according to their risk averseness by exploring the amount of time such buyers spend on searching for and evaluating information and the number of clicks and contacts they make to access further, detailed information. Therefore, e-stores can offer a dynamic web interface having different levels of interactivity and personalization to buyers based on their requirements rather than adopting a standardized interface.

### *5.3. Limitations and further research*

This study has a few limitations owing to its experimental nature and the testing of the effects of a restricted number of interactivity and personalization task-facilitative tools. Future work can consider a larger set of tools to manipulate the website interface. In addition, this study uses only one product category. Thus, future research can explore the applicability of the findings to a wider product context (involving less complex, routine-buying situations like online grocery purchase). Further studies can also use data from a less-developed country to explore the influence of the digital divide in such context.

To summarize, this study makes a unique effort to understand the role of task-facilitative tools on the prospective buyers' decision-making process in the case of a new e-store when the level of pre-purchase risk is high.

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Figure 1. Conceptual framework

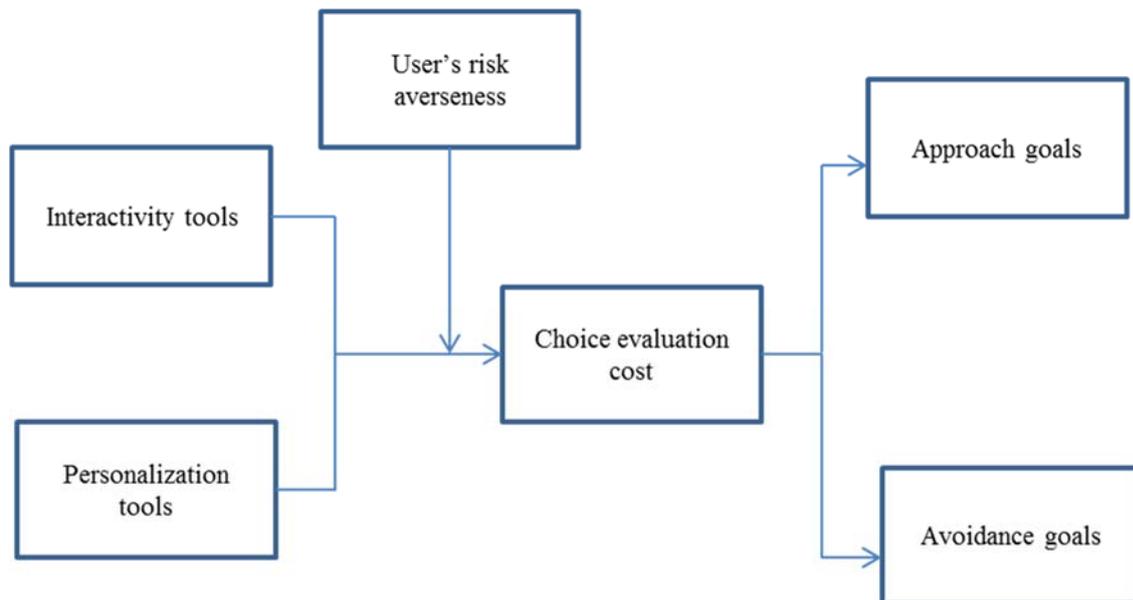


Table 1. Experimental stimuli manipulation

Features	Low interactivity	High interactivity	Reference
Product choice	Static- move from one product to the next	Dynamic- ability to filter as per price, brand, technical features such as hard drive capacity	Liu and Shrum, 2009
Recommendation agent	Absent	Presence of features such as buying guide, product rating guide	Häubl and Trifts, 2000
Comparison matrix	Absent	Presence of features such as price comparison guides	Häubl and Trifts, 2000
User reviews	Absent	Customer reviews about various brands	Adapted from real life e-stores
Glossaries	Absent	Jargon busters explaining various technical terms	Gupta et al., 2009
Features	Low personalization	High personalization	Reference
User-driven	No facility to create personalized wish list	Options for creating personalized wish list, my shopping cart	Tam and Ho (2006), Thirumalai and Sinha (2011)
Transaction-driven	No facility to create my account	Facility to create my account, save personal information, view	Tam and Ho (2006), Thirumalai and Sinha (2011)

		recently browsed items or items added to shopping cart	
External customization	Absent	Personalized email, newsletters sent when the user registers with the e- store	Ansari and Mela (2003)
Rewards	Absent	Sign-up deals for competition, early bird deals	Adapted from real life e-stores
Personal advice	Absent	Help me choose feature	Lee and Park (2009)

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Table 2. Construct correlations (n=273)

Constructs	Mean	SD	1	2	3	4	5	6
1. Risk averseness	4.32	0.51	1.00					
2. Anticipated regret	4.57	1.16	0.20*	1.00				
			*					
3. Negative affect	3.20	1.17	0.17*	0.29*	1.00			
			*	*				
4. Justifiability	4.48	0.97	-0.14*	-0.12*	-	1.00		
					0.24*			
					*			
5. Choice confidence	4.41	1.14	-0.12*	-	-	0.41**	1.00	
				0.51*	0.29*			
				*	*			
6. Evaluation cost	4.86	0.98	0.70*	0.42*	0.29*	-0.30**	-	1.00
			*	*	*		0.43*	
							*	

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\*\*p<0.01, \*p<0.05

Table 3. Regression model for hypotheses testing

Construct	Model 1		Model 2
	Evaluation cost	Approach goal	Avoidance goal
Interactivity (I)	-0.53**	0.37*	-0.16
Personalization (P)	-0.35**	0.16	0.16
Risk averseness (R)	-0.11	0.04	0.13
I X P	0.16	-0.03	-0.14*
I X R	0.56**	-0.43*	0.19
P X R	0.10	-0.16	-0.04
Evaluation cost		-0.41***	0.70***
R square	0.25	0.22	0.53
Model	F (6, 266)= 3.03***	F (7, 265)= 10.79***	F (7, 265)= 42.9***

Note: All constructs measured on a 7 point scale (1= strongly disagree, 7= strongly agree); Interactivity and Personalization (high versus low) represented with +1 and 0 respectively.

\*\*\*p<0.01, \*\*p<0.05, \*p<0.10