Vital Interface Components' in Online Shopping Tasks

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ABSTRACT

Empirical exploration of how online consumers interpret and value the marketing communication embedded in shopping interface components has the potential to advance knowledge of online consumer behavior and to inform design decisions concerning consumer-oriented Web sites. To date, little research has been completed regarding how interface components hinder or aid consumer perceptions of the online marketing message. This research investigates the relative importance of online shopping interface components for online consumer shopping tasks and the role they play within the context of the Elaboration Likelihood Model's central and peripheral routes of persuasion. The components *convenience*, *access to information*, and *trust* were implemented in an online shopping task. Specific preferences of respondents for each component were found to differ depending on three market segments: *time savers*, *information seekers*, and *general surfers*. A descriptive model of Web-based marketing components is presented.

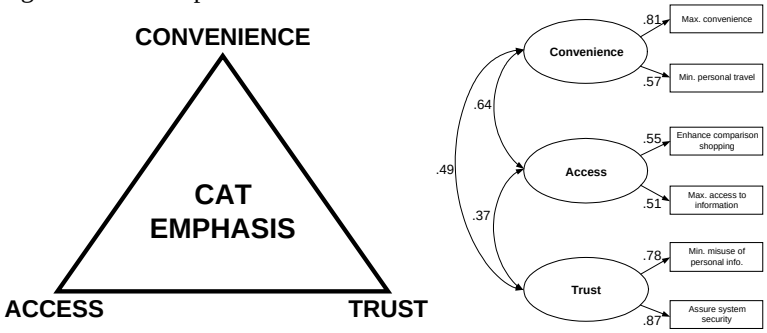
RESEARCH FRAMEWORK

Stevenson, Bruner, & Kumar (2000) and Bruner and Kumar (2000) asserted that components of the Web site design influence attitudes toward the underlying marketing message and that attitude-toward-the-Web site (A_{WS}) has an important role to play in the advertising hierarchy-of-effects. Attitude-toward-the-ad (A_{AD}), on which A_{WS} was derived, is based on cognitive evaluations of the ad and affective reactions to the ad (Burton & Lichtenstein, 1988; Celuch & Slama, 1995; Miniard, Bhatla, & Rose, 1990). These two tracks of persuasion are well represented in the Elaboration Likelihood Model (ELM, Petty & Cacioppo, 1986, 1996; Petty, Cacioppo, & Schumann, 1983), which postulates that a *central route* of persuasion exists for consumers who are interested in the information presented and such consumers carefully consider the content of the message in a thoughtful manner. Cho (1999) used the ELM in understanding how A_{WS} is influenced by the unique aspects of Web site design.

STUDY 1: INTERFACE COMPONENTS

Keeney (1999) described 26 classifications of important online shopping concerns expressed by consumers from 20 countries through a means-end objectives network. These classifications were through an online (Web-based) survey. Three factors with eigenvalues over one accounted for 57.43% of the total variance. Both personal information and security issues dominated factor 1, which was labeled *Trust*. The second factor contained the items interaction, comparison shopping, maximizing access to information, and ease of use; this factor was labeled *Access to Information* (hereafter referred to as *Access*). The last factor component included maximize convenience, minimize travel, and maximize enjoyment; thus, this factor was labeled *Convenience*. Convenience, Access, and Trust (CAT) formed a triangle of emphasis for further study (see Figure 1). This CAT result points to the areas in online shopping that have the greatest potential to influence likelihood for elaboration within the ELM context. Study 2 was undertaken to understand how the components of CAT actually influence the thoughts of online consumers and specifically in what direction (positive or negative thoughts).

Figure 1. CAT emphasis model and the CFA



STUDY 2

Study 2 employed an online conjoint experiment (a simulated online product search and purchase) based on the CAT components. A conjoint approach was chosen for its emphasis on understanding tradeoffs consumers make when evaluating competing options. The CAT construct, from Study 1, was represented by six independent variables, the study's conjoint stimuli, with each having two value levels. Validity of the attributes in describing the CAT constructs was tested with confirmatory factor analysis (CFA). The survey data from Study 1 was used in Analysis of Moment Structures with acceptable results. The model obtained a good fit (chi-square = 7.86, p = .25, GFI = .99) reinforcing confidence that the six attributes well represent the latent CAT factors.

The resulting six variables were implemented within the online shopping interface. A cover story explained a purchase was going to be made online by the experimenter and participants were to help in evaluating different online shopping designs. Approximately half the participants were asked to search for a physical product while the remainder searched for a service. A banner advertising the experiment was placed on a commercial portal Web page resulting in 429 respondents' with data complete and usable. The sample compared well with statistics on Internet usage in Taiwan at the time (Find, 2001; YamWeb Frontier Foundation, 1999). See Table 1 for hypotheses and results.

Table 1. Summary of hypotheses results

		Results for sample segments			
		Overall N = 428	Time Savers n = 91	General Surfers n = 240	Information Seekers n = 98
H_1	Minimizing travel to pick up a purchase will have a positive effect on A_{WS} for task-oriented shoppers.	S	S	NS	NS
H_2	Lower Web page complexity will have a positive effect on A_{WS} for task-oriented shoppers.	NS	NS	NS	NS
H_3	Increased levels of product information will have a positive effect on A_{WS} for task-oriented shoppers.	S	S	S	S
H_4	Including price comparisons in the search result will have a positive A_{WS} for task-oriented shoppers.	NS	NS	NS	NS
H_5	Including assurances that personal information will not be given to any third party will have a positive effect on A_{WS} for task-oriented shoppers.	NS	NS	NS	NS
H_6	Including assurances that the most up-to-date security software is being used to protect against fraud will have a positive effect on A_{WS} for task-oriented shoppers.	S	S	NS	S

Note: S = Supported; NS = Not Supported

Results and Discussion

Responses to the online conjoint shopping simulation exhibited good internal reliability with a Cronbach's alpha of .91 and a Guttman split-half reliability of .92. Part-worth utility values (see Table 2) show three CAT interface elements have the potential to play a moderating role in the cognitive processing stage of the ELM (minimize travel, information access, and fraud protection). Part-worth utility scores were used in a Ward's cluster analysis, producing a three-cluster pattern of dendrograms followed up with a K-means cluster analysis using the initial seed points from the hierarchical analysis. Independent conjoint analysis showed that each cluster contained respondents that approached the online shopping exercise with different expectations. Examining overall patterns, Cluster 1 (*Time Savers*) exhibited an emphasis on the presence of minimizing travel, information access, and fraud protection. Cluster 3 (*Information Seekers*) stood out for their emphasis on information access with a part-worth utility nearly three times larger than any other part-worth utility value. Minimizing travel was most important for Time Savers and least important for Cluster 2 (*General Surfers*). Examination of the research hypotheses within the context of the three clusters showed that the attributes not important to the overall sample were also not important to members of all three clusters (see Table 1). These included accessibility, price search information, and notification of personal information protection. The only attribute that was consistently valued across all three clusters was the inclusion of expanded product information.

Table 2. Part-worth utility values

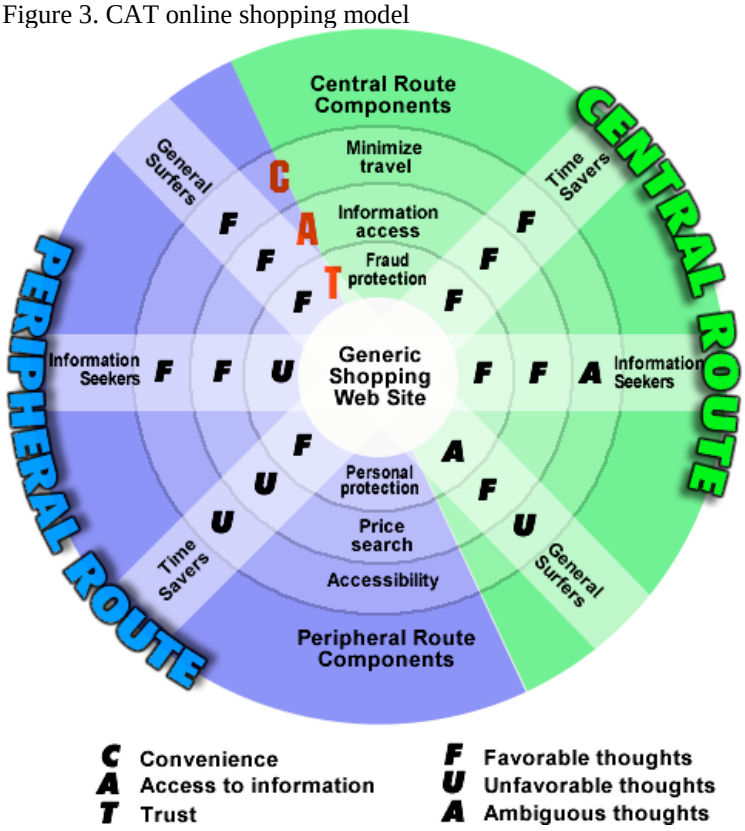
	Min. travel	Accessibility high	Info access high	Price search high	Personal protection high	Fraud protection high
Overall results	.081*	.023	.579*	-.006	-.021	.12*
N = 428	(.486)	(.494)	(.731)	(.465)	(.435)	(.487)

Note: Values in parentheses represent standard deviation; significance level represents difference between the two levels of the utility values tested with a paired *t*-test; * $p < .05$

CONCLUSIONS & IMPLICATIONS

Three CAT interface elements play a role in the processing stage of the ELM (minimize travel, information access, and fraud protection). The remaining three CAT elements (Accessibility, price search, and personal protection) may be useful in moderating peripheral cues. The specific direction of the influence (negative or positive thoughts) depends on the market segment the consumer is a member of. Results are combined and summarized in the online CAT model seen in Figure 3, where the central and peripheral routes split the circle, and each CAT component is concentrically represented in both routes. Market segments are displayed as straight lines crossing over the circles. Differences in attitude, among the market segments, toward the CAT components are represented by favorable, unfavorable, or ambiguous in the central route and favorable or unfavorable in the peripheral route (the three and two cognitive processing possibilities of the central and peripheral routes, respectively).

Figure 3. CAT online shopping model



The convenience of having the product shipped directly was only appreciated by the Time Savers segment. Thus, emphasizing the convenience of home shopping will be valued by Time Savers and increase the likelihood of elaboration for such a Web site. Elaboration likelihood for the same message is also increased for General Surfers, but in this case the result is likely to be negative, as this segment actually prefers to pick up the product. Ease of use design and displaying price search information lacked importance for all the segments when completing the online task. These elements are likely to be part of the peripheral route of persuasion, if they are to play a role at all. Expanded levels of information (product descriptions) was the only variable to elicit positive thoughts among all three segments, and most especially for Information Seekers. This means that Web sites that do not emphasize content run the risk of activating negative thoughts of visitors who are expecting increased levels of information.

Trust was valued differently by the three segments, with personal data protection not valued by any segment and actually disliked by the Information Seekers. It appears that this component is best implemented through the peripheral route, by avoiding direct emphasis on the Web page. It is possible that consumers assume the presence of such protection and any specific reporting of how the data will be handled raises the issue cognitively for viewers. This may be especially true for Information Seekers who would prefer to process information rather than give any out. Fraud protection is much more likely to cause elaboration when presented to Time Savers and Information Seekers, while for General Surfers this component makes little difference.

The convenience catalogs brought to rural Americans in the nineteenth century was bundled with payment systems, product delivery systems, and guarantees of quality in order to create an environment where exchange could occur smoothly. Issues of interface design are not new. Catalogs, like those from retailers such as Sears, Roebuck & Company, included product descriptions and graphics that were relevant (central route) to the rural farmers who were suspicious of *city folks* and money scams in the early twentieth century. Those early developments of marketing communication bundles eventually led to a catalog market totaling more than 120 billion USD in annual sales for the year 2000 (DMA, 2001). This study finds that online consumers do not have an endless list of prerequisites before they participate in the medium. A few vital components, combined correctly, can facilitate an enjoyable online shopping experience and increase the effectiveness of a Web site's marketing message.

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