

Dimensionalizing Involvement with Websites –
An Exploratory Study

Sivakumar Viswanathan
Leonard N. Stern School of Business
New York University

Maytal Tsechansky
Leonard N. Stern School of Business
New York University

Suresh Ramanathan
Leonard N. Stern School of Business
New York University

Fei Chen
Leonard N. Stern School of Business
New York University

1998

Working Paper Series
Stern #IS-98-6

Dimensionalizing Involvement with Websites - An Exploratory Study

Sivakumar Viswanathan

Maytal Tsechansky

Suresh Ramanathan

Fei Chen

Information Systems Department
Leonard N. Stern School of Business,
New York University.
MEC, Suite 9-181, 44, West 4th Street,
New York, NY 10012

Keywords: Technology and Consumers; Involvement; Interviews; Survey Research;
Factor Analysis; Discriminant Analysis.

The authors thank Jon A. Turner and Roger Dunbar, and Geeta Menon, for their constructive comments and suggestions that helped develop this paper.

Dimensionalizing Involvement with Websites - An Exploratory Study

Abstract

This paper studies the dimensions underlying user involvement with Websites and builds upon the existing body of knowledge on involvement with traditional media. A multi-dimensional bipolar semantic differential scale based on Zaichkowsky's Personal Involvement Inventory is used to identify the factors that determine the level of involvement in a Website. Websites are then classified, based on these factors, as high or low involvement sites. Involvement with Web sites was found to comprise of three dimensions - cognitive, affective and structural. Among these, the *cognitive* and the *affective* dimensions were found to have the highest discriminating power between high and low involvement sites while the *structural* dimension was found to serve as a moderating factor.

Dimensionalizing Involvement with Websites - An Exploratory Study

1.0 Introduction

The transformation of the World Wide Web (WWW) from an *information repository* to an *electronic marketplace* has raised the question of whether traditional marketing concepts can now be applied to the new medium and if so, how. In particular, in order to design an effective electronic marketplace on the Web, it is necessary to understand the factors that make Website visitors become positively involved with a site. While prior studies (Soldow and Principe, 1981; Kennedy, 1971) have established the importance of understanding users' *involvement with the context*, they have all been restricted to conventional media, and have focused largely on the impact of involvement on recall and attitudes towards advertisements. Despite the phenomenal growth and virtually unlimited potential of the WWW, there has been very little systematic research on the browsing patterns of WWW users, and their attitudes towards Website content.

This study builds on this existing stream of research on involvement, while trying to understand the distinguishing characteristics of involvement with the WWW. More specifically, we are interested in studying the dimensions underlying users' involvement with a Website. The rest of the paper is organized as follows. Section 2 provides an overview of prior research. Section 3 describes our research methodology. This is followed by our analysis and results in section 4. Section 5 discusses the implications of our findings, and Section 6 contains the limitations of our study. We conclude with a summary and directions for future research in section 7.

2.0 Prior Research

Since its initial formulation as a theoretical construct in social psychology nearly thirty years ago, *involvement* has played a central role in consumer psychology, marketing and advertising. Involvement can be with products (Howard and Sheth, 1969), with advertisements (Krugman, 1965), or with purchase decisions (Clarke and Belk, 1978). Each of these forms of involvement lead to a set of idiosyncratic behavioral patterns. However, the need to distinguish between these behavior-specific involvement characteristics led researchers to investigate the antecedent factors underlying involvement. Earlier studies in involvement have had a unidimensional conceptualization of involvement – they view it as the “extent of viewer arousal”. However, more recent studies have identified three dimensions as being consistently relevant (Zaichkowsky, 1986; Houston and Rothschild, 1978; Bloch and Richins, 1983). These dimensions include the characteristics of a *person*, the physical characteristics of the *stimulus* and the characteristics of the *situation*.

1. Personal characteristics include inherent interests, values and needs that motivate one towards the object.
2. Physical characteristics describe the nature of the object that cause differentiation and increased interest.
3. Situational characteristics include the contextual conditions that temporarily increase relevance or interest towards the object.

Zaichkowsky (1986) demonstrated that different people perceive the same object differently and have inherently different levels of involvement for the same object.

Wright (1973a) found that varying the modality of a message, from print to audio, influenced the response to the same message. Petty and Cacioppo (1979) manipulated involvement of subjects by leading subjects to believe they would or would not be affected by the stimulus.

According to Zaichkowsky (1986), a person's inherent value system, along with his or her unique experiences, determines whether the person is involved with a particular object. Similarly, physical differences pertaining to the type of media or the content, and the characteristics of the situation, also determine involvement. This conceptualization of the involvement construct (Zaichkowsky, 1986) is illustrated in Figure 1, along with the many forms of behavior resulting from involvement.

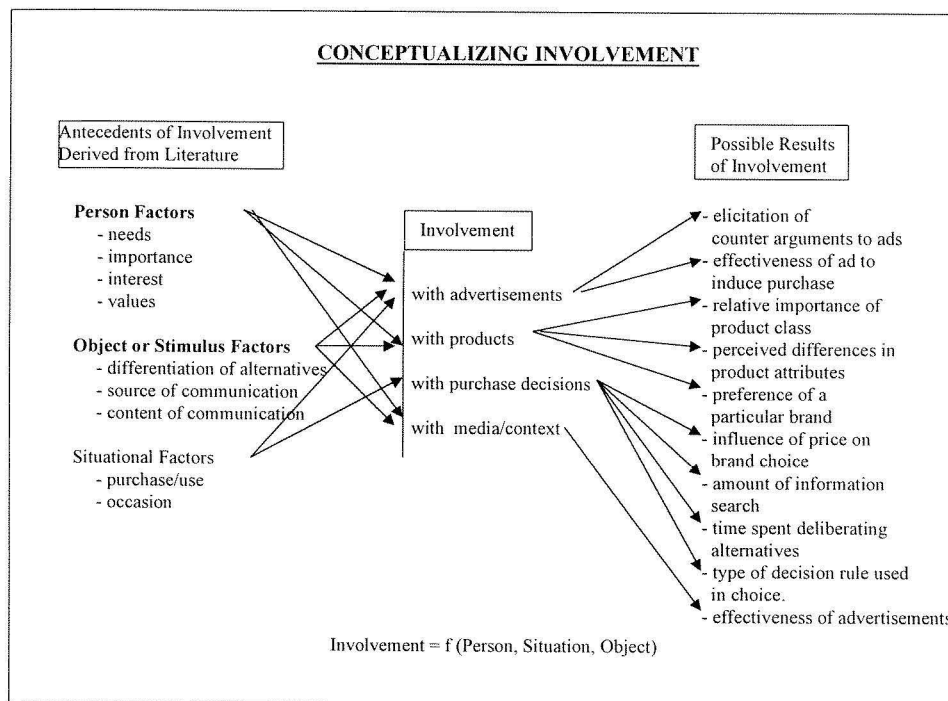


Figure 1

Zaichkowsky (1985) developed a 20 item bipolar semantic differential scale called the Personal Involvement Inventory (PII), which measured, the state of involvement of an individual. This scale was tested and was found to have a significantly positive relationship to subjects' stated level of involvement. This scale has been used extensively to measure personal involvement with product categories and advertisements.

Research into advertising has found that involvement has two dimensions - cognitive and affective (Park and Young, 1986). The Cognitive dimension emphasizes the individual's information processing activities. The Affective dimension emphasizes feelings and emotional states. Park and Young (1986) characterized these as functions of the degree of personal relevance of the message or issue based on functional performance (utilitarian motive) or emotional / aesthetic appeal (value-expressive motive).

To sum up, the subject of involvement research has primarily been restricted to products, television programs or print and television advertisements. Given the unique characteristics of the Web as a medium, and the diversity of Web sites, it is necessary to devise a scale suitable for measuring involvement with Web sites.

3.0 Methodology

Given the absence of prior research into the underlying dimensions of Web-browsing behavior, it was necessary to conduct our study in two phases. The first phase involved eliciting different adjectives that could be used to describe websites. We conducted a qualitative study, based on in-depth interviews and the results of this study were used to modify the original PII scale. The aim of the second phase was to construct the

dimensions of involvement with websites, and devise a method to classify sites based on the level of involvement subjects had with them.

The adjectives evoked in the qualitative phase formed an important input to the second stage. The Zaichkowsky PII scale was modified to accommodate adjectives elicited through the qualitative study. Irrelevant items were deleted from the original PII scale. Our revised scale had 24 items. The scale was tested with three expert judges (senior faculty members from our Marketing department), and was also pretested on 5 subjects (different from the ones in the first phase). The pretest revealed three items that could not be answered in the given context of the WWW, because of extraneous factors influencing the response on them. Two items were found to be redundant. The sixth item had significant disagreement in its classification. This could not be resolved, and the item was dropped. Therefore, our revised PII scale had 18 items measuring the different dimensions of involvement. Table 1 details the scale. The revised scale had an inter-rater agreement of 96% (Cronbach's alpha = 0.93).

Eight websites (see Table 2), chosen for their relative lack of familiarity across subjects, and pre-classified by three experts (faculty members from the Department of Marketing) as either high or low involvement (Cronbach's alpha = 0.945), were shown to 20 subjects, all of whom are Ph.D. students at a major northeastern university. Subjects were asked to spend about three minutes browsing through each Web site, and then rate the site on the PII scale. Order effects were controlled for by varying the order of exposure of the sites.

4.0 Analysis

Factor analysis was used to examine the groupings among the rating scale. Each of the 20

subjects completed ratings for eight Web sites, giving a total of 160 observations or cases for the factor analysis.

Web Page URL :	Scale
uninteresting	interesting
important	unimportant
systematic	chaotic
irrelevant	relevant
exciting	unexciting
useless	useful
vital	superfluous
appealing	unappealing
easy-to-use	difficult
informative	uninformative
mundane	fascinating
convenient	inconvenient
messy	neat
unstructured	well-structured
fun	boring
not needed	needed
organized	disorganized
attractive	unattractive

Table 1

	Web Sites		Web Sites
1	http://www.usatoday.com	2	http://www.forestpro.com
3	http://www.ultimatetv.com	4	http://www.sidewalk.com
5	http://www.infoseek.com/shopping	6	http://expert-market.com
7	http://www.farmdirectory.com	8	http://www.mirsky.com

Table 2

We used Principal Components Analysis and varimax rotation with squared multiple correlation in the diagonal for factor extraction, to determine the number of factors to be extracted. Three factors accounted for over 70% of the variance, with none of the others accounting for more than the cut-off of 5% contribution to variance. Figure 2 shows the scree plot for the Factor Analysis.

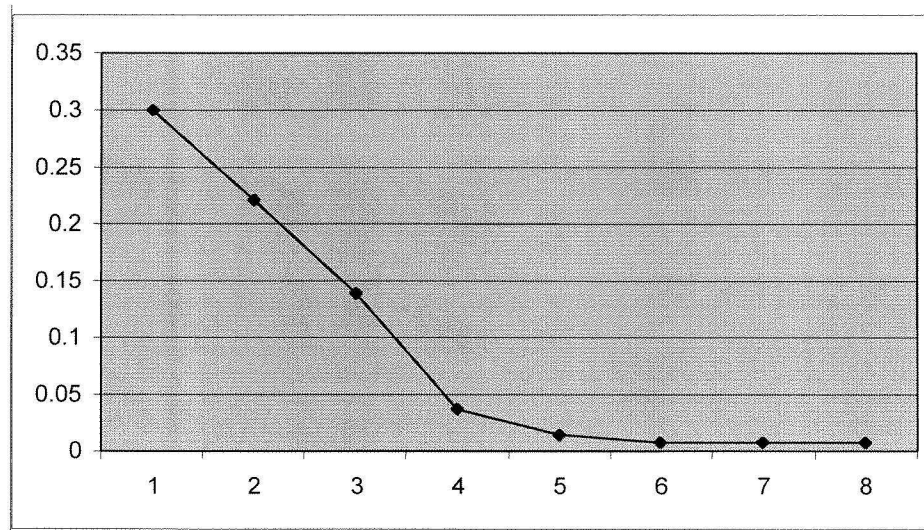


Figure 2

As shown in Table 3, the first factor accounted for 31.6% of the variance. The leading items included “needed” and “useful” and was labeled “Cognitive.” Intuitively, the fact that this dimension plays such a critical role is consistent with the hypothesis that the Web is primarily an *information provider*, particularly to the type of audience among whom we conducted this study.

The second factor accounted for 22.3% of the variance, and included items such as “organized,” “structured” and “neat.” We labeled this dimension “Structural.” This emerges as a very important dimension, consistent with Raman(1997), who found in his qualitative study that Web-surfers tend to be impatient and value ease of access.

The third dimension accounted for 19.9% of the variance and included items such as “interesting,” “fun” and “exciting.” We labeled this dimension “Affective.” This factor captures the capacity of the site to hold attention through its appeal and ability to sustain interest. It is a reflection of the “entertainment value” of the site. Factor scores were then computed for each of the 160 cases, and then averaged out among the 20 subjects to yield factor scores for each of the eight Web sites. Table 4 shows the factor scores for each Website.

Factor 1: Cognitive 31.6% Variance	Factor Loading	Item Mean	S.D.
Needed	0.846	4.14	2.00
Useful	0.835	4.25	2.18
Relevant	0.808	4.11	2.11
Vital	0.77	3.6	1.68
Important	0.743	3.91	2.03
Informative	0.695	4.70	2.02
Factor 2: Structural 22.3% Variance			
Organized	0.829	4.84	1.61
Structured	0.733	4.75	1.63
Neat	0.727	4.78	1.59
Systematic	0.713	5.01	1.53
Convenient	0.683	4.88	1.54
Ease of Use	0.656	5.32	1.43
Factor 3: Affective 19.9% Variance			
Attractive	0.735	4.05	1.89
Fun	0.715	4.07	1.92
Exciting	0.695	3.71	1.89
Interesting	0.624	4.16	2.25
Appealing	0.601	4.11	1.89
Fascinating	0.593	3.71	1.65

Table 3 - Factor Analysis Results, Item means and Standard Deviations

Websites	Factor 1 (Cognitive)	Factor 2 (Structural)	Factor 3 (Affective)
1	0.6497862	0.35066865	0.31116605
2	-0.4200906	-0.5371623	-0.67965356
3	0.5762583	0.3728878	0.53842095
4	0.1491564	0.14915639	0.14915639
5	0.5270687	0.25173843	0.44212304
6	0.3040798	-0.060428	-0.48325879
7	-0.5429459	0.13743759	-0.95171902
8	-1.2433129	-0.6248224	0.44115302

Table 4: Factor Scores by site

It is interesting that the subject pool among whom this study was conducted valued *information* and *structure* as more important than *entertainment*. In contrast, Eighmey (1997) in a field study of commercial Web sites among 200 participants recruited from the public, reported that these subjects valued entertainment more than any other factor.

We then performed a discriminant analysis in order to examine :

1. Whether the three factors (*cognitive*, *affective*, and *structural*) by themselves could effectively classify sites as *high* or *low involvement* ones (by evaluating the discriminating power of the resultant function).
2. The relative importance of the various factors as discriminators between *high* and *low involvement* sites.

The independent variables used were the factor scores obtained for each Web site (see Table 4). The dependent variable was the level of involvement, and was defined to be categorical taking one of two values - high or low. Three experts (faculty members in the Dept. of Marketing) preclassified the sites as having 'high' or 'low' involvement ($\alpha=0.945$). These scores were used as prior probabilities for the analysis.

The discriminant analysis revealed a high level of correlation between the structural dimension and the other dimensions (see Table 5). This prompted us to use a step-wise discriminant procedure to determine the order of entry of variables into the discriminant function.

	Cognitive	Structural	Affective
Cognitive	1		
Structural	0.60092	1	
Affective	-0.55320	-0.64240	1

Table 5 : Pooled within group correlation matrix

The *cognitive* and *affective* dimensions were found to be the only factors that entered the step-wise analysis. The standardized discriminant function (see Table 6) shows that after elimination of the structural dimension, the two remaining factors, cognitive and affective are almost equally important in determining group membership.

Variable (factor)	Weight
Cognitive	1.06308
Affective	1.05255

Table 6 : The canonical discriminant function with standardized coefficients

Table 7 summarizes the group membership for the eight sites as predicted by the discriminant function. Correct classification was achieved for every site.

Actual group	Number of Cases	Predicted High Involvement	Predicted Low Involvement
Group 1 : High Involvement	4	4 100%	0 0%
Group 2 : Low Involvement	4	0 0%	4 100%

Table 7 : Prediction Summary

The significance tests for the equality of group means over the two discriminating variables as shown in Table 8, indicates that the mean values are significantly different ($p < 0.05$) for low and high involvement sites.

Variable	Wilks' Lambda	F	Significance
Cognitive	0.42814	8.0142	0.0299
Affective	0.44517	7.4778	0.0340

Table 8 : Significance test for the equality of group means

The resultant discriminant function was tested for significance (Table 9), and Wilk's lambda associated with the function was 0.14754, which translated to a chi-square statistic of 9.568 with 2 degrees of freedom. This is significant beyond the 0.01 level. The high eigen value (5.777) indicates the superiority of the discriminant function. The canonical correlation associated with the function is 0.9233, which means that the function accounts for over 82% of the total variance in the involvement measure.

Eigenvalue	% of var	Cum %	Canonical Correlation	After Fcn	Wilk's Lmbda	Chi-Square	Df	Sig
				0	0.1475	9.568	2	0.0084
5.7777	100	100	0.9233					

Table 9: Canonical Discriminant Functions

Figures 3 ,4, 5 and 6 show how the various sites are placed on the involvement map. It is seen that sites with high involvement typically have a high score on each of the three dimensions. We hypothesize that while the *structural* dimension is not an independent factor in determining group membership as evidenced by the discriminant analysis, it is an important 'hygiene' factor in sustaining involvement levels.

5.0 Implications

The "involvement" construct is basically motivating in nature (Zaichkowsky, 1986). When we are involved we pay attention, perceive importance and behave in a different manner than when we are not involved. This has significant implications for firms using

the Web. Our study indicates that involvement with websites is an important issue that should be of interest to both web designers and advertisers. Involvement with Web sites varies across websites, users and situations. The ultimate aim of any Web designer should be to design the site so that Web surfers will attend, comprehend and be involved with the site. The importance for advertisers lies in their ability to understand the different circumstances under which a Web-based advertisement might be effective and how to tailor their advertising content, execution and placement for different Web sites. Our study indicates that a site with high scores on each of the three dimensions has “high involvement” However, a site (Web site #8, see Fig 3,4,5 and 6) which is high on “affectiveness” but low on “structural” and “cognitive” dimensions is still a “low involvement” site. Similarly, a site (Web site #6, see Fig. 3,4,5 and 6) which is high on “structural” and “cognitive” dimensions, but low on “affectiveness” is also a “low involvement” site. The discriminant analysis reveals that the critical factors in determining the level of involvement were the scores on the cognitive and affective dimensions. The factor analysis, however, shows that the structural dimension also accounts for a significant amount of the variance in involvement levels, possibly as a ‘hygiene’ factor. Web designers and marketers would benefit immensely from an awareness of factors that are necessary for “high involvement”. Prior research (e.g., Park and McClung 1986 ; Wright 1973b) has established the impact of involvement with context on the effectiveness of advertisements placed in that context. Given this, advertisers would do well to be aware of the implications of the differences among Web-sites and their impact on Web-based advertisements.

6.0 Limitations of the Study

The sample used for the study is a convenience sample and this may affect the generalizability of the results. In particular, the subjects in our sample, given their true education and nature of work, might not be fully representative of the general population of Internet users. Despite the richness of the findings and the significance of the results, the study covered a limited number of websites. A study covering a larger variety of Web sites would throw light on other subtle differences. Self-reported measures may affect the

Figure 3

Involvement Map

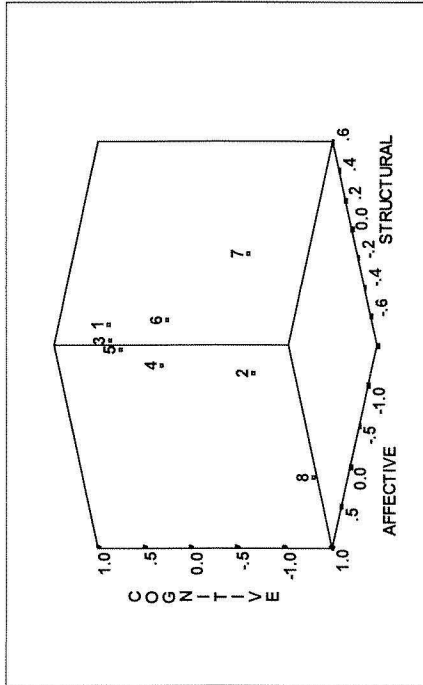


Figure 4

Structural & Cognitive Map

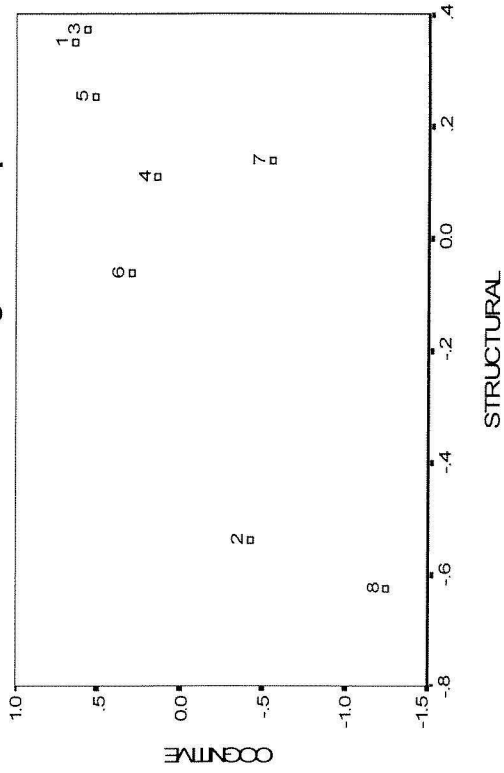


Figure 5

Affectiveness & Cognitive Map

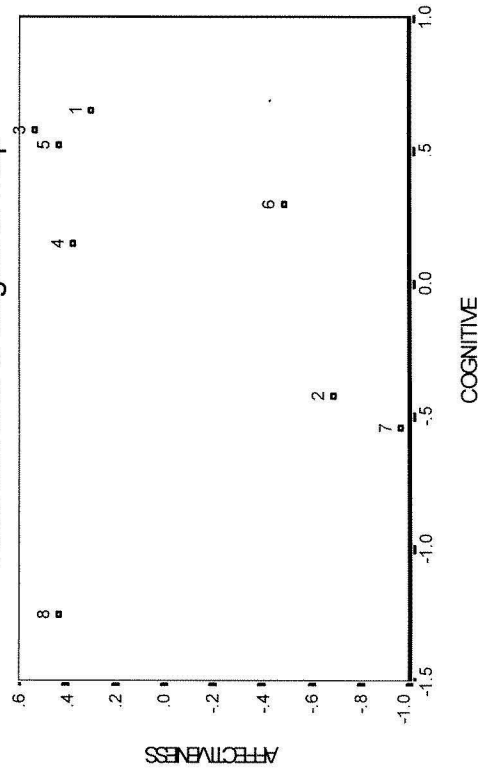
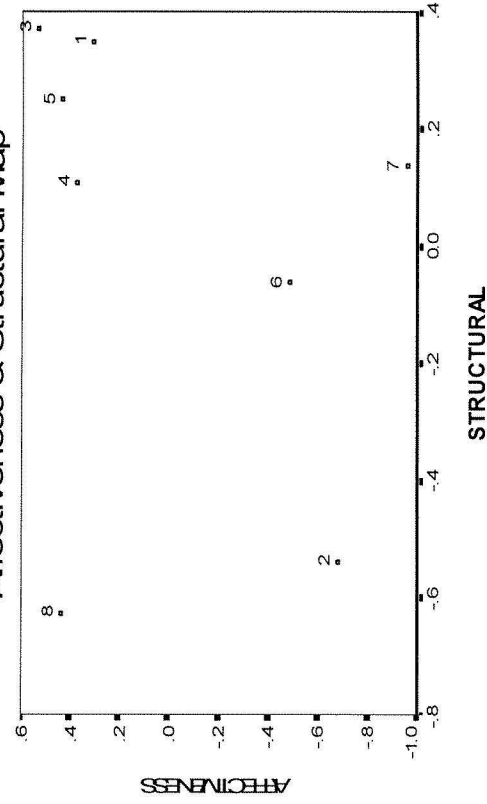


Figure 6

Affectiveness & Structural Map



Discriminant Maps

Legend
 1, 3, 4, and 5 are *high involvement Websites*
 2, 6, 7, and 8 are *low involvement Websites*

accuracy of the study; observation of users' browsing behavior, we believe, might yield additional insights.

By constructing a discriminant function, we try to analyze and explain differences between the two types of web sites in our sample. However, since the model has not been validated on out of sample data, its level of fit may be upward biased (Morrison 1969). Therefore, the statistical indicators on the function's discriminating power should be cautiously interpreted.

7.0 Conclusion

The results of this study show that involvement is an important mediator of web-browsing behavior. In dimensionalizing the components of involvement with respect to web-browsing behavior, this paper extends the body of knowledge on involvement with traditional media. While a lot of work is being done by industry practitioners to arrive at better estimates of 'hits' so as to enable more focused targeting, there is little research on how these consumers would actually consume messages placed on the Web. This paper is an attempt in that direction.

Two important results emerge from our study. Firstly, there are three major dimensions of involvement – cognitive, affective and structural. While research on television also shows the existence of a cognitive and an affective dimension, the importance of the structural dimension for the Web is underscored by the fact that it accounted for 22% of the variance on the factor analysis. Secondly, while the cognitive and structural factors emerged as the two most important factors, it was the cognitive and affective components that had the highest discriminating power between high and low involvement sites. Clearly structure is not an independent factor, but related to the other two dimensions. Yet, it has the potential to attenuate or enhance involvement, and is therefore as important as the cognitive and affective dimensions.

It would be interesting to study individual differences in the components of involvement across different types of consumers, and how these could affect recall of advertisements. Future research could also probe the dynamics of instrumental versus casual browsing, and the role of mood (e.g., boredom, anxiety, etc.) on browsing behavior.

References

- Anderson, R.C., and Ortany.A (1975), "On Putting Apples into Bottles....A Problem of Polysemy", *Cognitive Psychology*, 7, pp.167-180.
- Bloch, P.M., and Richins, M.L.(1983), "A Theoretical Model for the Study of Product Importance Perceptions", *Journal of Marketing*, 47 (Summer), pp.69-81.
- Chaiken,S(1980), "Heuristic Versus Systematic Information Processing and the Use of Source Versus Message Cues in Persuasion", *Journal of Personality and Social Psychology*, 39 (5), pp.752-766.
- Clarke, Keith and Belk, W.R, (1978), "The Effects of Product Involvement and Task Definition on Anticipated Consumer Effort", *Advances in Consumer Research*, Vol.5, ed. H.Keith Hunt, Ann Arbor, MI: Association for Consumer Research, pp.313-318.
- Crane, L.E. (1964), "How Product Appeal and Program Affect Attitudes Towards Commercials", *Journal of Advertising Research*, 4 (1), pp.15-18.
- Eighmey, J. (1997), "Profiling User Responses to Commercial Websites", *Journal of Advertising Research*, Vol. 37, No.3, May/June 1997.
- Engel, J.F., David Kollat and Blackwell, R.D. (1978), "Consumer Behavior", New York, Dryden Press.
- Howard, J.A., and Seth, J.N.(1969), "The Theory of Buyer Behavior", New York: John Wiley.
- Houston, M.J., and Rothschild, M.L.(1978), "Conceptual and Methodological Perspectives in Involvement", in S.Jain (ed.), *Research Frontiers in Marketing: Dialogues and Directions*, Chicago: American Marketing Association, pp.184-87.
- Jacoby, J.(1984), "Perspectives on Information Overload", *Journal of Consumer Research*, 10 (4), pp.432-435.
- Kassarjian, H.H.(1981), "Low Involvement: A Second Look", *Advances in Consumer Research*, Vol.8, ed. Kent B. Monroe, Ann Arbor, MI: Association for Consumer Research, pp.31-34.
- Kennedy, J.R., (1971), "How Program Environment Affects T.V. Commercials, *Journal of Advertising Research*, 11 (1), February, pp.33-38.
- Krugman, H.E (1965), "The Impact of Television Advertising: Learning Without Involvement", *Public Opinion Quarterly*, 29, pp.349-356.
- Morrison, D. G. (1969), "On the Interpretation of Discriminant Analysis", *Journal of Marketing Research*, 6 (May), pp. 156-163.
- Murphy, J.H., Cunningham,I., and Wilcox,G.B (1979), "The Impact of Program Environment on Recall of Humorous Television Commercials", *Journal of Advertising*, 8(2), pp.17-21.

- Olney, T.J., Holbrook, M.B., and Batra, R. (1991), "Consumer Responses to Advertising: The Effects of Ad Content, Emotions and Attitude Towards the Ad on Viewing Time", *Journal of Consumer Research*, 17 (March), pp. 440-453.
- Park C. Whan, and McClung, W (1986), "The Effect of TV Program Involvement on Involvement with Commercials", *Advances in Consumer Research*, Vol.13, Richard J.Lutz, ed., Association for Consumer Research, pp.544-548.
- Park C. Whan, and Young, S.M (1986), "The Impact of Involvement and the Role of Music in Advertisements on Brand Attitude Formation", *Journal of Marketing Research*, 23 (February), pp.11-24.
- Petty, R.E., and Cacioppo, J.T (1979), "Issues Involvement Can Increase or Decrease Message Relevant Cognitive Responses", *Journal of Personality and Social Psychology*, 37 (October), pp.1915-1926.
- Raman, N.V. (1997), "A Qualitative Investigation of Web-Browsing Behavior" *Advances in Consumer Research*, 24, pp.511-516.
- Smith, M.C., Theodoe, L., and Franklin, P.E (1983), "The Relationship Between Contextual Facilitation and Depth of Processing", *Journal of Experimental Psychology: Learning, Memory and Cognition*, 9 (4), pp.697-712.
- Soldow, G.F., and Principe, V (1981), "Response to Commercials as a Function of Program Context", *Journal of Advertising Research*, 21 (1), April, pp.59-65.
- Tulving, E. and Thompson, D. M. (1973), "Encoding Specificity and Retrieval Process in Episodic Memory", *Psychological Review*, 80, pp. 352-373.
- Wright, P (1973a), "Analyzing Media Effects on Advertising Response", *Public Opinion Quarterly*, 38 (Summer), pp.192-205.
- Wright, P (1973b), "Cognitive Processes Mediating Acceptance of Advertising", *Journal of Marketing Research*, 10 (February), pp.53-62.
- Zaichkowsky, J.L (1985), "Measuring the Involvement Construct", *Journal of Consumer Research*, 12, December, pp.341-352.
- Zaichkowsky, J.L. (1986), "Conceptualizing Involvement", *Journal of Advertising*, 15 (2), pp.4-14.