

ACCESSING INFORMATION ON THE WEB: PREDICTING USAGE BASED
ON INVOLVEMENT

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Advice for Web designers often includes an admonition to use short, scannable, bullet-pointed text, reflecting the common belief that browsing the Web most often involves scanning rather than reading. Literature from several disciplines focuses on the myriad combinations of factors related to online reading but studies of the users' interests and motivations appear to offer a more promising avenue for understanding how users utilize information on Web pages. This study utilized the modified Personal Involvement Inventory (PII), a ten-item instrument used primarily in the marketing and advertising fields, to measure interest and motivation toward a topic presented on the Web.

Two sites were constructed from Reader's Digest Association, Inc. online articles and a program written to track students' use of the site. Behavior was measured by the initial choice of short versus longer versions of the main page, the number of pages visited and the amount of time spent on the site. Data were gathered from students at a small, private university in the southwest part of the United States to answer six hypotheses which posited that subjects with higher involvement in a topic presented on the Web and a more positive attitude toward the Web would tend to select the longer text version, visit more pages, and spend more time on the site.

While attitude toward the Web did not correlate significantly with any of the behavioral factors, the level of involvement was associated with the use of the sites in two of three hypotheses, but only partially in the manner hypothesized. Increased

involvement with a Web topic did correlate with the choice of a longer, more detailed initial Web page, but was inversely related to the number of pages viewed so that the higher the involvement, the fewer pages visited. An additional indicator of usage, the average amount of time spent on each page, was measured and revealed that more involved users spent more time on each page.

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CHAPTER 1

INTRODUCTION

Statement of the Problem

A commonly quoted belief about reading on the World Wide Web (Web) is that users skim or scan rather than reading serially and therefore prefer terse, bullet-pointed factual writing to longer, narrative styles. This assertion appears in writing guides (Kilian, 1999; Spyridakis, 2000) advice on Web publishing (Lynch & Horton, 1997; Spool, 1999) and in the standards documents of the World Wide Web Consortium (Techniques for Web Content Accessibility Guidelines, 1999). Nielsen's writings (Nielsen, 1997; Morkes & Nielsen, 1997) about users' preferences for shorter, terse, scannable pages, if not the genesis for the belief, are at least often referenced by other Web pages, with direct links from over 1,100 pages as shown in a Google search of the Web (Google Advanced Search:Find Pages That Link to the Page, 3a; Google Advanced Search:Find Pages That Link to the Page, 3b).

This belief that summaries, bullet points, and snippets of information can effectively substitute for longer, detailed writing, and in fact may be preferred by readers on the Web, has support in several areas by theorists and practitioners alike. Terms such as “surf” and “browse” rather than “read” are often used to describe Web usage and support a very different image of the Web reader than the one often associated with reading, that of a person curled up with a good book, engrossed in the story presented by the author.

Not only does the vocabulary of Web use suggest the idea of movement from screen to screen, but the general vocabulary of a society that talks commonly of information overload supports it as well. Borgmann (1992) adopts this view that the nature of reading is affected by society as a whole and that society is increasingly fragmented and busy, forcing reading materials to compete with other media for our attention. Levy (1997) proposes this "busyness" as a cause of an inability to focus attention long enough to read serially and deeply. He speaks of "hyper-extensive" reading where one searches for "just the right, the most relevant, minimal units or fragments" (p. 208). He says that this type of reading "might be characterized as a frenzy of short bursts of shallow attendings to information fragments" (p. 208).

In addition to these societal factors, the unregulated, exponential growth of the Web, a popular source of online reading material, along with the ease of publishing has resulted in very uneven levels of information quality and a resulting lack of credibility for some sites (Fogg et al., 2001). Because there is no standard set of descriptive information that accompanies links on the Web, detailing the site at the other end of the link, the Web user is left without the evidence such as size, weight, cost, cover, and illustrations that give readers of traditional publications a basis for judging the material (Snyder, 1997). It is not surprising that users would "surf" until they find information that appears to be credible and relevant.

So, the idea that we live in a world of information overload, with users jumping from site to site in search of information appears to have some support, but is there empirical evidence that users do indeed prefer shorter, bullet-pointed text to detailed prose in online writing?

Research into online reading has covered a broad range of areas. The human-computer interaction (HCI) field has a rich history of research into online reading with early topics ranging from effects of resolution on speed and comprehension to more recent studies that consider typologies of reading goals and characteristics of users (O'Hara, 1996). Parallel with these studies have emerged a growing number of hypertext studies with emphasis in recent years migrating to the Web, as evidenced by major themes in hypertext conferences and organizations (e.g., Association for Computing Machinery's Hypertext, Hypermedia and the Web). Along with this emphasis on hypertext came assertions that hypertext was different from traditional texts, by virtue of links and nodes holding an almost infinite number of texts from which to choose, in effect converting the reader into an author (Snyder, 1997). Navigation became an issue as did the concept of "lost in space." The belief that the reading we do online is inherently different than traditional reading is a logical step, but is it an assumption based on certain tasks, goals, and users or can it be generalized to all Web and other online readers? Do Web users always prefer short, bullet-point text to longer, narrative writing, or are there other factors within the individual or the situation that may change a user's preference from one day to the next?

While studies within these areas increase understanding of Web reading and the use of information in general, a more fundamental understanding of readers' motives for reading is needed. Wilson and Walsh (1996) identify motivation as a construct as being useful in information seeking behavior in general and review concepts and theories from several disciplines in order to enrich understanding of information seeking behavior. This study utilizes a concept from the marketing and advertising fields called "involvement" to

more completely understand users' motives for choice of text and time spent reading that text. Involvement can be defined as "a motivational variable reflecting the extent of personal relevance of the decision to the individual in terms of basic goals, values, and self-concept" (Gabbott & Hogg, 1999 p. 160).

Significance of the Problem

Presenting information in an efficient way that meets the needs of users will be increasingly important considering the explosive growth of the Web, estimated to be as high as 513 million users (Nua, 2001).

In addition, as wireless displays with reduced size displays become more prevalent, knowing when information can be reduced to a minimum representation will be critical.

Also, as the total amount of information available to users increases, effective means of reducing content, and knowing when it is advisable, will be important.

While the present study does not purport to answer these questions definitively, all advances in knowledge will contribute to the successful use of online information sources.

Finally, the information science profession's 2002 American Society for Information Science and Technology (ASIST) Award of Merit to Patrick G. Wilson acknowledges the importance of such concepts as the basic relevance of documents being based "primarily on the inquirer's own personal concerns, preferences and stock of knowledge" (ASIST Award of Merit Bestowed Upon Patrick G. Wilson, 2002).

Research Question

What is the relationship between involvement and reading on the Web?

Hypotheses

In order to answer the research question, the following hypotheses will be tested.

H₁ Readers with high involvement with a topic will be more likely to read longer text versions of an expository text than readers with low involvement.

H₂ Readers with a positive attitude toward the Web will be more likely to read longer text versions of an expository text than readers with a negative attitude toward the Web.

H₃ Readers with high involvement with a topic will be more likely to click on links leading to more information and features such as reviews and message boards than readers with low involvement.

H₄ Readers with a positive attitude toward the Web will be more likely to click on links leading to more information and features such as reviews and message boards than readers with a negative attitude toward the Web.

H₅ Readers with high involvement with a topic will spend more time on the site than readers with low involvement.

H₆ Readers with a positive attitude toward the Web will spend more time on the site than readers with a negative attitude toward the Web.

Independent variables are involvement and attitude toward the Web.

Dependent variables are whether or not the reader chooses the long version, the number of clicks (or pages visited) and the total time on the site.

CHAPTER 2

LITERATURE SURVEY

Introduction

Research that examines Web usage is extensive because the Web is used not only to obtain information but to pass the time, to communicate, for entertainment, for business purposes, and a whole host of other reasons (Hunter, 2001; Korgaonkar & Wolin, 1999; Ko, 2000). In the present study, the concern is with a reader accessing a Web page, a form of hypertext, and choosing (or not choosing) to read the text and selecting (or not selecting) related links. Although issues of format will be considered, the primary concern is with the user and his or her motivation for reading text on the Web. Therefore, related areas include online reading, hypertext, interest, motivation and involvement.

Human-Computer Interaction

The human computer interaction (HCI) field has contributed many studies to online reading. Many of these studies, especially early ones, have examined differences between print and online reading, focusing primarily on outcome rather than process (Dillon, 1994) and dealing with such factors as speed, fatigue, comprehension and recall. Comprehensive reviews of this literature note the difficulty in drawing any generalizable conclusions due to the differences in experimental methodology (Dillon, 1994) and the advances in screen technologies (Spyridakis, 2000). There is no conclusive evidence from these studies to suggest that readers choose a shorter or longer page solely on the basis of screen resolution or screen size, though readers may print out longer texts rather than reading them online (Lynch & Horton, 1997). In addition, these studies have been

criticized for their approach. Dillon (quoted in (O'Hara & Sellen, 1997) stated about this research that "Most [ergonomists] seem to concern themselves with the control of so many variables that the resulting experimental tasks bears little resemblance to the activities most of us routinely perform as 'reading'" (O'Hara & Sellen, 1997, p. 335).

While these studies primarily examine laboratory-based reading, others in the same field look at how real-life tasks affect the online reading process, either by emulating those tasks or by studying readers in real-life settings (O'Hara & Sellen, 1997; Adler, Gujar, Harrison, O'Hara, & Sellen, 1998). Dillon states that "texts possess more than purely physical properties. Readers imbue them with values and attribute them roles in the support of a host of real life acts in innumerable work and leisure domains" (1994, p. 85). Studies in this area focus on the vast number of variables associated with the types of reading, reading materials, and goals associated with reading tasks and relate to Dillon's call to study reading within a framework that asks three questions about the reading process. He says that "all texts are describable by readers in terms of three criteria: why they read them, how they read them, and what general type of information they contain" (1994, p. 163). Others (Rouet, Levonen, Dillon, & Spiro, 1996) also point to the need to consider type of text, how it will be used, and who will use it. Several studies that relate to these areas are presented below.

What is Being Read

The type of text being read is the last area suggested by Dillon's framework but will be considered first here. Discourse theory suggests that documents have structures that readers expect in order to make sense of the content (Dijk & Kintsch, 1983; Charney, 1987). There are "stable patterns that writers employ on every level of text, from small

units such as sentences and paragraphs, up to grand schemas that outline the structure of an entire text" (Charney, 1987 p. 110). Certain genres of text have typical goals associated with them and will be written and presented in a format that the reader expects (O'Hara, 1996). Readers construct hierarchical representations of these texts (Dijk & Kintsch, 1983) and form a mental model or schema of the document. Dillon (1991) found that users familiar with academic journals could reassemble pieces of an article based on their knowledge of how an article is constructed. "From a rapid scan of the available text they can deduce the most likely location of that part in the whole and by extension, what is likely to precede, accompany and follow it" (Dillon, 1991, p. 923).

Certainly the "what" of text reading material may influence how it is read, but it is also evident that a document intended for one kind of reading may be read for another (O'Hara, 1996). A novel may be intended by the author to be read for enjoyment but may be used to teach writers how to write or be the subject of an academic study. There are no guarantees that writing will be used as intended by the author. "Reliance solely on existing conventional [sic] genres is misleading since any one genre may exist in multiple contexts of use" (Dillon, 1994 p. 85).

How Documents are Read

The expectations that a reader brings to a document also affects how the document will be read. Zwaan (1994) selected texts that could be interpreted as either a literary story or a news story. Readers were given the exact same text, with the only difference being the expectation of genre. Zwaan found that this expectation had a significant effect on the amount of time reading as well as memory for surface and situational information. Readers of a story may withhold judgment on the value of a

surface detail when reading a literary story, given the tendency in this genre to postpone resolution of the story until the end. Therefore, the reader must wait to find out whether a detail is important, "keeping seemingly irrelevant propositions active in memory" (Zwaan, p. 925). Reading the news, on the other hand, gives a different expectation, that the main message of the story is transparent and attention can be focused on deeper situational concerns.

The "how" of reading also includes the activity that is used to access the text. Adler et al. (1998) studied subjects from a range of professions who kept a diary of reading tasks while at work over a five day period. The authors believe that their study was the first to study reading in the context of work. They found that "for much of the work day, our subjects were involved in rapid and goal directed types of reading such as skimming (SK) and searching to answer questions (SAQ)" (p. 243). They discovered different types of "skimming," or reading quickly to determine action to be taken; proofing, or a fast check of contents to be sure documents are in order or to review the information; browsing, which was most often used in newspapers and magazines to get an overall sense of an article. The first two types of skimming were related to a specific task accomplished partly by reading while the last had no immediate goal in mind. Because the study was not just about online reading, but reading of paper documents as well, it suggests that skimming is not just a Web activity, but also occurs when using paper documents. Therefore, the activity of skimming may be more related to the task or goal that causes the reading rather than merely the medium containing the text and would apply to paper as well as to the Web.

Why a Reader Reads

Dillon states that “there is a coupling between a text and the reader and this may shift as the reader’s task alters” (1994, p. 85). The "why" of reading in many studies is synonymous with the task or goal of reading. Reasons for reading include, but are not limited to, reading to learn, to self inform, to search/answer questions, for research, to summarize, for discussion, proof-reading, to write and revise documents, for problem solving and decision making, for critical review, and for enjoyment (Adler, 1998; Levy, 1997; O'Hara, 1996). Although most of these tasks (e.g., to learn or to summarize) do not appear to be inherently associated with a preference to a style of writing (e.g., bullet points or narrative), there is evidence that tasks do affect how a text is read. Redish (1998) for example, distinguishes between reading to do and reading to learn as it relates to computer tutorials. Readers who are reading in order to immediately perform a task will skip over paragraphs, scanning the document for relevant material. Mills, Diehl, Birkmire and Lou (1995) observed a difference between reading to do and reading to recall, finding that those reading to do read the information more slowly and thoroughly.

Another reason in the literature for reading involves the sampling of documents to determine if they are relevant for a specific purpose. Closely related to the use of the Web is the concept of "browsing" (O'Connor, 1993) to find documents that fill an information need or allow new conceptual connections for a researcher. O'Connor's discussion of browsing is pertinent, not necessarily because his use of the term "browsing" always describes the same activity of browsing the Web, but because it provides a basis for understanding why users will "engage" a document or will choose not to do so.

Browsing for a scholar is sampling and evaluating documents, finding and making connections that may never show up in the standard bibliographic description of the document set. O'Connor calls it a "discovery activity" (1993, p. 213) in which the user/browser examines the attributes of a document to determine whether it should be engaged more completely. This process of "mak[ing] glimpses" of a document (p. 223) may be the phenomenon that Morke and Nielsen (1997) have identified in studies of Web usage. Whether a Web reader skims or fully reads may be a function of whether the "glimpses" of the page indicate it is worth fully reading, or "engaging" (O'Connor, p. 223).

While O'Connor's discussion of browsing concerns scholarly behavior and the improvement of the bibliographic process, the principle of sampling documents to determine whether they are relevant for a purpose is closely related to the use of the Web to access information.

Hypertext

Some of the preceding areas of research can be applied to either print or paper, and indeed are applied to both in many cases as the topic of study. Another area of research attempts to study reading that can only be done online, or hypertext. "Hypertext systems tend to envision three different types of readers: the reader as browser, as user, or as co-author" (Slatin, 1990 p. 875) and implies that a reader using hypertext must take a more active role than a reader of traditional paper texts.

Hypertext theorists believe that the breaking up of texts into component parts, giving the reader the option of which navigation path to take to assemble a text,

effectively converts a reader into an author (Tuman, 1992). However, this role of author comes with a cost, imposing a greater cognitive load on the reader (Spyridakis, 2000). This extra cognitive load comes about due to the need to navigate, choosing which links to follow and forming a mental representation of the structure of the site (Spyridakis, 2000). Hypertext then causes readers unfamiliar with a genre to form new strategies to create the schema of the information structure (Esperet, 1996).

Although all of these areas are applicable to Web readers and give insight into the use of the Web, they focus primarily on specific instances of tasks or types of reading and depend on specific combinations in order to reach a conclusion about user preferences. Research into how such factors as interest and motivation fit into the picture is underrepresented in the literature though Nielsen as early as 1989 in a quasi meta-analysis of hypertext studies concluded that users' "individual differences are the most important effect for hypertext usability" (1989 p. 244).

Interest and Motivation

While the areas of research represented so far are related to reading on the Web, they fail to ask the question of why a user would want to read at all. Interest and motivation are assumed. Several studies of interest suggest that interest affects how much is read, how much is remembered, and how much is learned (Baldwin, Peleg-Bruckner, & McClintock, 1985; Schiefele, 1999; Schiefele & Krapp, 1996). Another group of studies outside the computer area consider interest and motivation and the effect they have on reading.

Schiefele (1999) differentiates between two forms of interest, personal and situational interest. Personal interest, sometimes referred to as topic interest, is stable

over the long term (Schiefele, 1999). Situational interest, as its name suggests, is a "temporary state that is elicited by specific features of a text" (p. 258). Interest has been shown to affect comprehension (Baldwin et al., 1985), recall (Schiefele & Krapp, 1996), navigation patterns through hypertext (Lawless & Kulikowich, 1998) and depth of processing (Schiefele, 1999).

Motivation is a broader concept that can include interest and can be defined as "the wish or intention to engage in a specific activity" (Schiefele, 1999 p. 259) or specifically applied to reading motivation, "involvement, curiosity, preference for challenge, recognition, and competition" (Guthrie, Wigfield, Metsala, & Cox, 1999). A person might be motivated to read a particular text because of interest in the topic of the text (intrinsic motivation), but the anticipation of rewards or negative consequences or another external force can also be the source of motivation (extrinsic motivation).

Although an instrument has been developed to measure motivation for reading (Wigfield, 1997) it is not appropriate for college students' reading on the Web. The Motivation for Reading Questionnaire (MRQ) appears to have been written with children in mind, asking such questions as "I always do my reading exactly as the teacher wants it" (p. 64).

Involvement Theory

Involvement deals with various concepts in marketing and advertising that are concerned with the level of motivation and interest that one has in a product or purchase decision. It is seen both as a unitary construct that can be measured directly (Zaichkowsky, 1985) and as a multi-dimensional construct that can only be measured by its antecedents (Laurent & Kapferer, 1985). Proposed antecedents vary, but generally

include sign value, interest, and motivation. Involvement has been applied to areas both inside and outside of marketing and advertising areas including purchase decision (Mittal, 1989), message (Maheswaran & Meyers-Levy, 1990) and leisure and travel (Kyle, 2000). Especially relevant to this study, involvement has an effect on the amount of information seeking and depth of processing (Celsi & Olson, 1988). It is primarily for this reason that involvement is believed to be useful for measuring Web readers' reading preferences.

Involvement can be defined as "a motivational variable reflecting the extent of personal relevance of the decision to the individual in terms of basic goals, values, and self-concept" (Gabbott & Hogg, 1999 p. 160).

Laczniak, Muehling and Grossbart compare several definitions of message involvement and define it as "the motivational state of an individual induced by a particular advertising stimulus or situation" (1989, p. 30). They also compare several means of manipulating the message involvement that in all cited cases center around introductory material, either giving instructions to focus on a certain aspect of a set of advertisements or giving specific tasks to complete based on a fictional scenario. They distinguish between product involvement and message involvement and their study suggests that product involvement can be high while having message involvement either high or low.

Mittal (1989) focuses on involvement in the purchase decision rather than the product or message, and in giving various definitions by different researchers, states that the common thread is that "involvement is the degree of interest of a person in an object" (p. 148). He believes product involvement to be a precursor to purchase-decision involvement, though not a necessary one. His definition of purchase-decision

involvement is "the extent of interest and concern that a consumer brings to bear upon a purchase-decision task" (p. 150).

Andrews, Durvasula and Akhter (1990) present a model that has three basic parts, with antecedents in the form of motivational factors first, then involvement that results in outcomes in the form of consequences. Park and Mittal (as cited in Andrews et al.) believe that the differences should rather be explained by the different goals that are affected, whether instrumental or nonfunctional goals, suggesting that the latter will cause greater arousal. Where Mittal (1989) identifies three antecedents to involvement (utilitarian or performance, sign and hedonic), Laurent and Kapferer (1985) posit five antecedents (perceived risk with two components of importance and probability, interest, sign value and hedonic value).

Celsi and Olson (1988) focus on the subjective nature of involvement, noting that one may have an ongoing involvement with an activity or product, such as tennis, but not be motivated at a particular moment (felt involvement) to participate in related activities or purchase related products. Perceived personal relevance is "the essential characteristic of involvement" (p. 211) in their view, with sources of felt involvement being physical and social aspects of the environment or situation, and the intrinsic characteristics of the individual. When an individual is confronted by an advertisement, for example, information stored in memory is activated creating a motivational state, which leads to overt behaviors such as shopping for the product, or cognitive behaviors such as giving attention to the advertisement and expending effort to comprehend the message. The ability to comprehend is based on knowledge about the product, whereas the motivation to comprehend is based on the factors of the situation itself (Celsi & Olson, 1988).

Applying this to the question at hand, whether one will read a page on the Web or skip by it, it would seem likely that the reader's long term involvement as well as the current situation, would influence the decision. While one may have a long term interest in health, an expectancy of the possibility of disease, a recent bout with illness or one's child being sick could provide motivation to read the medical literature more carefully (Maheswaran & Meyers-Levy, 1990). Therefore, an object or event may be important on an ongoing basis but not personally relevant, i.e., not producing strong felt involvement, at the moment.

Celsi and Olson (1985) refer to the ongoing source of felt involvement as "intrinsic sources of personal relevance" or ISPR, and factors in the immediate environment as "situational sources of personal relevance" or SSPR. A product is relevant to the extent that it is perceived to provide a linkage between the needs, goals, and values of an individual.

Durairaj and Meyers-Levy (1990) examine the role of involvement in the processing of health-related information and find that readers with high involvement process messages in more detail than those with low involvement. Involvement was manipulated by changing the introductory material in the instructions to either state that young people under the age of 25 were at risk of heart disease or that people over the age of 65 were at risk. They also found that those with high involvement are more likely to be persuaded by a negatively-framed message, emphasizing the consequences of not adhering to the medical advice given, while those in low involvement were more likely to

be persuaded by a positive message. They used Zaichkowsky's (1985) Personal Involvement Inventory (PII)¹.

A limited number of studies have applied involvement theory to the Web in advertising, hypothesizing that users would click through ads, seeking more information (Cho & Leckenby, 2000) and spend more time on a site (Raman & Leckenby, 1998).

Knezek and Christensen (1998) and Knezek, Christensen, Miyashita, and Ropp (2000) have adapted the modified PII (Zaichkowsky, 1994) to measure teachers' attitudes toward the Web, validating the Teachers' Attitudes Toward Information Technology (TAT v2.01) for use with teachers' attitudes toward various information technologies such as email, the Web, multimedia, computers for professional productivity and computers in the classroom.

Limitations

Although involvement is a concept that has over fifty years of research, it still lacks a consensus on definition and conceptualization (Garlin & McGuiggan, 2001; Andrews et al., 1990). In spite of this criticism, several instruments have been created (Zaichkowsky, 1985; Mittal, 1989; Laurent & Kapferer, 1985) that measure various aspects of involvement or its antecedents and have been compared and considered to measure the same essential construct (Goldsmith & Emmert, 1991).

Summary

Garlin & McGuiggan (2001) review the literature, noting that despite the wide variation in involvement studies and different streams of research, there are common

¹ □ 1984, Judith Lynne Zaichkowsky, http://www.bus.sfu.ca/homes/judy_z/judy_z.pdf. Used with permission.

themes that emerge. They propose a model that includes the major streams of concept and consider involvement as "an individual difference variable that is motivated by a range of antecedents, which together create personal relevance. Personal relevance links the antecedents and the motivational state to a stimulus that results in a variety of potential outcomes" (A Modified Framework for the Conceptualisation of the Involvement Construct section).

CHAPTER 3

METHODOLOGY

Introduction

To gain a more thorough understanding of the nature of the relationship between involvement with a topic and reading behavior on the Web, a ten-item instrument was used to measure involvement with a Web site topic, utilizing also a twenty-item instrument measuring students' attitude toward the Web to control for attitude toward the medium itself. Students were then asked to use a Web site on one of two topics, money (saving, investing) and losing weight (diet, exercise). Data were collected from undergraduate students on involvement and attitude and their use of the Web site was recorded for analysis. This chapter details the subjects, the instruments used, the procedures for collecting the data, the methods of statistical analysis, and the limitations and delimitations of the study.

Description of Subjects

Subjects participating in this study were undergraduate students at Abilene Christian University, a mid-sized, private university in Abilene, Texas, in the southwestern United States. Data were collected during the Spring 2002 semester. Classes were selected from morning, afternoon, and evening classes, though daytime classes predominated. Seventy-eight total students participated and eleven were removed from the data set due to incomplete results, yielding 67 total cases for analysis. The

majority of the students (85.1%) were in the 18 to 24 year old age bracket (Table 1), with 34 males and 33 females.

Table 1

Distribution of Subjects by Age

Age of Subjects		
Age	Frequency	Percent
18-24	57	85.1
25-29	4	6.0
30-34	1	1.5
35-39	2	3.0
40-44	1	1.5
55-64	2	3.0
Total	67	100.0

In addition to the demographic characteristics, background information questions designed to determine amount and quality of Web usage were presented (Appendix E).

The number of hours per week using the Web, level of access, familiarity, level of proficiency, and level of usage were assessed as part of the instrument.

The majority of students in the study had unlimited access to the Web with only 11.9 % having to leave their place of residence for access (Table 2). Options were (a) access only outside the residence, (b) shared access with another person in the place of residence, and (c) unlimited access to one or more computers for personal use.

Table 2

Level of Access to the Web

Access	Frequency	Percent
Only outside residence	8	11.9
Shared in residence	19	28.4
Unlimited personal	40	59.7
Total	67	100.0

Familiarity with the Web was measured on a scale of 1 to 5 with 5 being more familiar (Table 3). No students reported the lowest level of familiarity, with over 95% responding 3 or above.

Table 3

Familiarity with the Web

	Familiarity	Frequency	Percent
Less	1	0	0.0
	2	3	4.5
	3	16	23.9
	4	26	38.8
More	5	22	32.8
Total		67	100.0

Proficiency with the Web was measured on a scale of 1 to 5 with 5 being more proficient (Table 4). As with familiarity, no subjects reported the lowest level of proficiency, and only 7.5% reported the next level with over 90% reporting 3 or above.

Table 4

Proficiency with the Web

	Proficiency	Frequency	Percent
Less	1	0	0.0
	2	5	7.5
	3	18	26.9
	4	25	37.3
More	5	19	28.4
Total		67	100.0

Level of usage of the Web was measured on a scale of 1 to 5 with 5 using it the most (Table 5). As with familiarity and proficiency, few reported usage toward the bottom of the scale, with over 80% reporting 3 or above.

Table 5

Level of Web Usage

	Level	Frequency	Percent
A Little	1	2	3.0
	2	10	14.9
	3	12	17.9
	4	22	32.8
A Lot	5	21	31.3
Total		67	100.0

Response to these questions indicate that as a group, the college students participating in the study have considerable access to Internet-connected computers and are frequent and competent users of the Web.

Instrumentation

The instrument used to measure involvement was the Modified Personal Involvement Inventory, or PII². It is a 10 item, semantic differential questionnaire (Zaichkowsky, 1994) revised from the original PII (Zaichkowsky, 1985). Although the assumption based on the literature is that involvement is the primary factor affecting the access of information on the Web, a second instrument, the Attitude Toward the Web Questionnaire, was used to control for the effects of attitude.

² □ 1984, Judith Lynne Zaichkowsky, http://www.bus.sfu.ca/homes/judy_z/judy_z.pdf. Used with permission.

Selection of instrument

Several scales have been developed to measure involvement and/or its antecedents. Zaichkowski's original scale (1985) was a twenty-item, semantic differential scale called the Personal Involvement Inventory, or PII. It was criticized for length and purported not to be applicable to advertising (Zaichkowsky, 1994). Zaichowsky revised her Personal Involvement Inventory scale (1994) to reduce the number of redundant items and to validate it for use with advertising. The revised version has ten items instead of the original twenty, with one new item (involving/uninvolving) while maintaining construct validity. Zaichkowsky's study did not confirm that the scale could be broken into subscales that measured affective and cognitive factors, concluding that "it is not clear that affective and cognitive types of involvement can be separated" (p. 67).

Zaichkowski's revised PII (1994) was selected because of its ability to measure involvement as it relates to aspects of the situation, the person and the object or message, and because of its length and its testing on areas outside of product involvement.

Reliability and Validity of the Instrument

Goldsmith and Emmert (1991) compare three scales designed to measure involvement: Zaichkowsky's Personal Involvement Inventory, Laurent and Kapferer's Consumer Involvement Profile Inventory, and Mittal's Involvement Scale. They concluded that all three have convergent and discriminant validity, and had criterion-related validity when correlated with two other scales of global marketplace involvement, Slama and Tashchian's PIS (1985) and Feick and Price's MMS (1987), which studied the influence exerted by well-informed "market mavens." They conclude that "the researcher apparently may use any of the three scales evaluated in this study with some assurance

that they measure the same construct" (p. 371). Although the PII was found to have greater internal consistency, the length of the instrument was seen as a drawback. However, since that time, Zaichkowsky (1994) revised the scale, reducing it from twenty to ten questions.

The mean reported Cronbach alpha of the original, twenty-item PII is .95 with scores from .91 to .95 for advertisements and .94 to .96 for products on the shorter, ten-item modified PII (Zaichkowsky, 1994).

The Teachers' Attitudes Toward Information Technology (TAT), which uses the modified PII to measure teachers' attitudes toward information technology on a number of subscales has internal consistency reliability estimates ranging from .93 to .96 (Knezek & Christensen, 1998), all above the range of "very good" according to DeVellis' guidelines (1991).

The Attitude Toward the Web questionnaire has been tested for internal reliability at a large public university in north Texas on a sample of 150 subjects with Cronbach's alpha ranging from .70 to .89 on three factors in the survey: intimidation through complexity, utility, and negative impact on society.

Analysis of the Instruments for the Current Sample

Personal Involvement Inventory

The modified PII was tested for internal reliability for this sample using Cronbach's alpha and established an internal consistency estimate of .93 for the "money" track and .95 for the "weight" track. Internal reliability for both tracks ranks above the range of "very good" according to DeVellis' guidelines (1991).

Principal components factor analysis with orthogonal (varimax) rotation was used (Table 6) to analyze the responses to determine whether subscales existed as hypothesized by Zaichkowsky (1994). Factors with an eigenvalue of 1.0 extracted and rotated. Only factors with at least three variables and an acceptable Cronbach's alpha were included (Kim and Mueller, 1978).

Table 6

Cognitive and Affective Sub-Scales of Involvement as Measured by the PII

	Cognitive	Affective
not needed/needed (1)	.923	.205
relevant/irrelevant (1)	.893	.258
worthless/valuable (1)	.847	.284
important/unimportant (1)	.818	.413
means nothing/a lot to me (1)	.799	.394
involving/uninvolving* (2)	.562	.407
boring/interesting (2)	.200	.890
fascinating/mundane (2)	.263	.860
exciting/unexciting (2)	.396	.803
appealing/unappealing (2)	.572	.686

*Rejected due to low alpha score
 (1) Zaichkowsky's cognitive and (2) affective scale items

The subscales grouped according to Zaichkowsky's hypothesized groupings, with the exception of involving/uninvolving, which had a similar loading on both subscales, only slightly higher for the cognitive scale (5.6/4.1).

Attitude Toward the Web

The Attitude Toward the Web questionnaire was tested for internal reliability and established a Cronbach's alpha of .85, which is in DeVellis' very good range (1991).

Principal components factor analysis with orthogonal (varimax) rotation was used to analyze the responses to determine whether subscales existed (Table 7). Factors with an eigenvalue of 1.0 were extracted and rotated. Only factors with at least three variables and an acceptable Cronbach's alpha were included (Kim and Mueller, 1978). The instrument grouped logically on the same three factors as the referenced study, though the relative strength and number of the second two factors reversed, with negative impact on society second and utility third.

Table 7

Rotated Factor Matrix of Questions on Attitude Toward the Web Scale

Question	Intimidation through complexity	Negative Impact on Society	Utility
18	.921		
16	.896		
17	.895		
19	.848		
20	.701		
5		.823	
4		.817	
2		.738	
3		.678	
12			.809
15			.804
13			.701

Procedures

The instrument (PII) was administered in the early part of the Spring 2002 to students in selected undergraduate courses. Instructors were contacted to request their participation and to determine willingness to participate. The survey, which included demographic information, the PII, and the Attitude Toward the Web scale, was

administered online. Subjects were assigned randomly to one of the two topics, either weight or money, and proceeded directly into the related Web site.

Two topics were selected that were expected to have potential interest to a broad range of age groups. Weight loss and money are both expository and were constructed from Reader's Digest Association, Inc. online articles to control for reading level and style. Narrative writing is used to tell a story whereas expository text is intended to inform others about a subject (Cooter & Flynt, 1996, p. 226).

Subjects were given one of the two topics at random. They gave demographic information and filled out the Attitude Toward the Web and the modified PII for the assigned topic before viewing the Web pages about the assigned topic. They were then presented with a page of instructions and were given the choice of either a short or long version of the topic.

Both the abbreviated and the detailed versions of the topic Web pages contained the same links to additional pages. The Web site consisted of pages created specifically for the experiment and contained no links to outside Web sites. Each click was recorded in a database, storing the numeric ID of the participant, the time measured in seconds from the Unix epoch and the Uniform Resource Locator (URL) accessed.

The overall testing site contained a sample page that presented two sets of information. The first was a summary of the topic in bold type formatted to facilitate scanning (Morkes & Nielsen, 1997). The second had the same information and important information bolded, but with paragraphs of text, primarily manipulating the amount of information rather than the format. In this way the page was still scannable, as recommended by Morkes and Nielsen (1997). The student had the option to choose the

longer version of the page but both the long and the short version had links to more information about the topic, such as message boards and related stories or other information. The page was maintained in a frameset with a button to log out of the site when completed.

Statistical Analysis

The independent variables were level of involvement and attitude toward the Web. Dependent variables were the initial choice of content versions, number of pages accessed, and total time on the site.

Data Analysis

Hypotheses 1 and 2 compared the mean involvement and attitude scores of those selecting the longer version of the initial page versus those choosing the shorter version and were tested using *t* tests of independent means. Hypotheses 3 through 6 compared the amount of time spent on the site and the number of pages and were tested using Pearson product moment correlation analysis.

Analyses were conducted both on the entire sample and divided on the basis of tracks, either weight or money. In addition, several post hoc analyses were conducted to investigate the relationships among the variables more thoroughly using correlation analyses.

An alpha level of $p \leq .05$ was used for all statistical tests.

Limitations and Delimitations

The subjects for this study were undergraduate students at a small to mid-size private university, limiting the generalizability of the results.

Though the PII has been used in studies of message processing, the original research and revision was validated for use in marketing and advertising.

There are several limitations related to the choice of texts. First, only expository texts were studied and may limit application to narrative writing. While narrative writing is used to tell a story, expository text is intended to inform others about a subject (Cooter & Flynt, 1996). Second, any choice of topics will necessarily be a small percentage of the possible topics.

Finally, the Web is used for many reasons, only one of which is information access. This study did not attempt to measure involvement related to entertainment or other uses of the Web.

CHAPTER 4

PRESENTATION AND ANALYSIS OF DATA

Introduction

The findings and interpretation of data analysis are presented in this chapter. The purpose of the study was to determine the relationship of involvement in a topic presented on the Web and attitude toward the Web to the behavior of students using a Web site. Behavior was measured by the initial choice of short versus longer versions of the main page, the number of pages visited and the amount of time spent on the site. Data were gathered to answer six hypotheses which posited that subjects with higher involvement in a topic presented on the Web and a more positive attitude toward the Web would tend to select the longer text version, visit more pages, and spend more time on the site.

Independent variables were involvement (INV) as measured by the Personal Involvement Inventory , or PII (Zaichkowsky, 1994)³, and attitude toward the Web (ATT) as measured by the Attitude Toward the Web instrument.

Dependent variables were the selection of length of text (LNTXT), number of pages accessed (PAGES) and the time spent on the site (TIME). Table 8 summarizes the variables and their characteristics.

³ □ 1984, Judith Lynne Zaichkowsky, http://www.bus.sfu.ca/homes/judy_z/judy_z.pdf. Used with permission.

Table 8

Independent and Dependent Variables

Name	Abbrev	Ind/Dep	Values	
Involvement	INV	Independent	Cont/Interval	1-7, 10 items
Attitude toward Web	ATT	Independent	Cont/Interval	1-5, 20 items
Length of Text	LNTXT	Dependent	Discrete/Nominal	0-1
No. of Pages Viewed	PAGES	Dependent	Discrete/Interval	0-max
Time on Site	TIME	Dependent	Cont/Ratio	0-max seconds

The distribution of the scores for the two independent variables, INV and ATT are presented as a whole and by each of the tracks of money and weight. The distribution of scores is approximately normally distributed for the samples as a whole with involvement scores negatively skewed. The tracks show more variability, perhaps due to the smaller sample sizes. Tables 9 and 10 present the means and standard deviations of involvement (INV) and attitude (ATT) scores respectively by complete sample as well as by topic, either money or weight. Figures 1 through 6 present histograms of the distributions, comparing the scores to the normal distribution.

Table 9

Involvement Scores for Both Topics, Money and Weight

	Mean	SD	Minimum	Maximum	<i>n</i>
Both Topics	53.13	12.46	10	70	67
Money	54.35	9.14	31	70	34
Weight	51.88	15.20	10	70	33

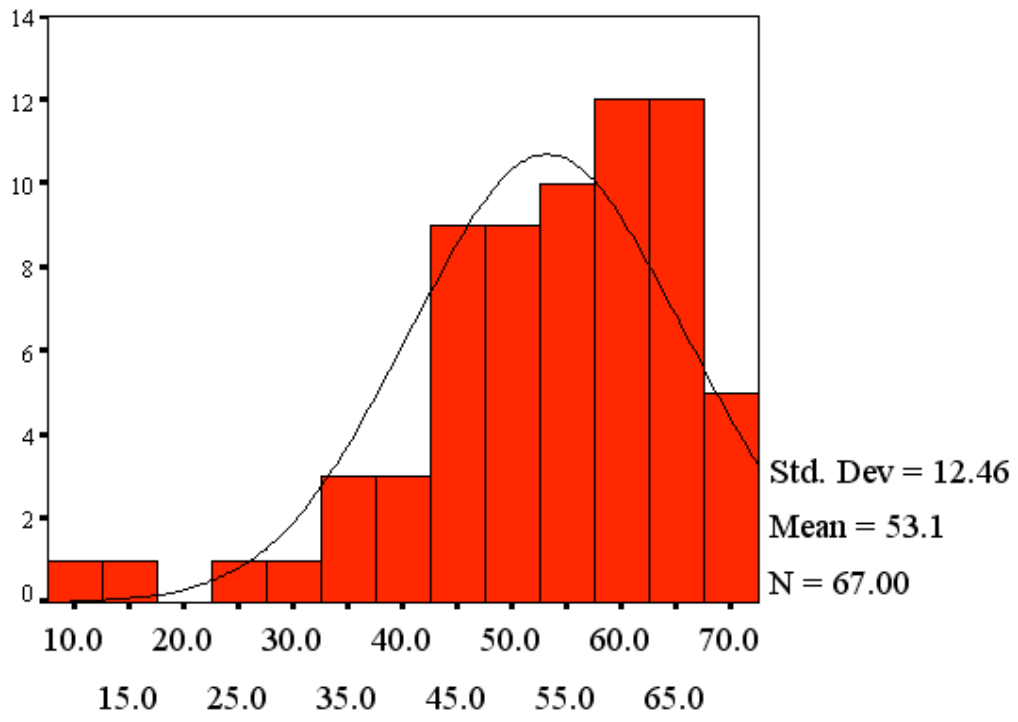
Table 10

Attitude Scores for Both Topics, Money and Weight

	Mean	<i>SD</i>	Minimum	Maximum	<i>n</i>
Both Topics	74.01	10.62	39	100	67
Money	74.12	10.08	54	100	34
Weight	73.91	11.31	39	91	33

The mean scores for the money and weight tracks are not significantly different from each other for involvement, $t(52.19) = .80, p = .43$, or attitude, $t(65) = .08, p = .94$.

Histogram of INV

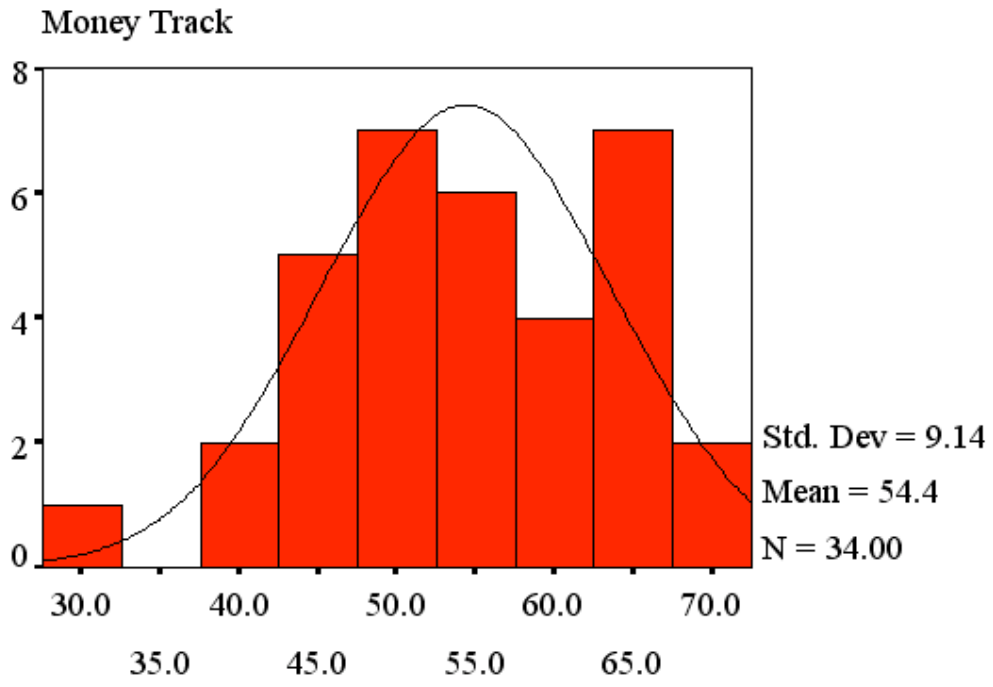


PII

Figure 1

Histogram Distribution of Involvement Scores for Both Topics

Histogram of INV



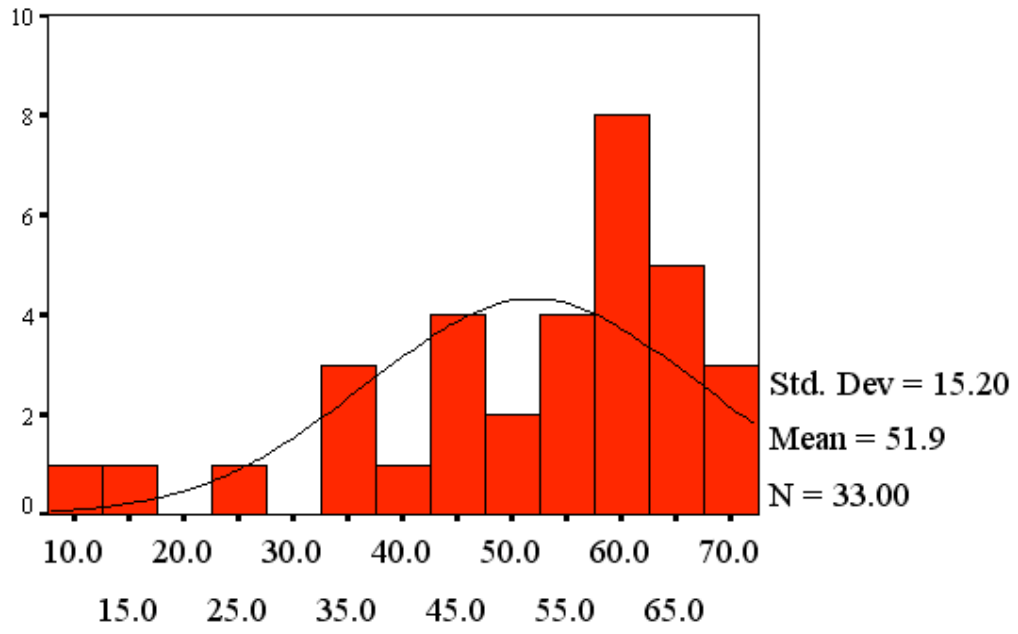
PII

Figure 2

Histogram Distribution of Involvement Scores for Money

Histogram of INV

Weight Track



PII

Figure 3

Histogram Distribution of Involvement Scores for Weight

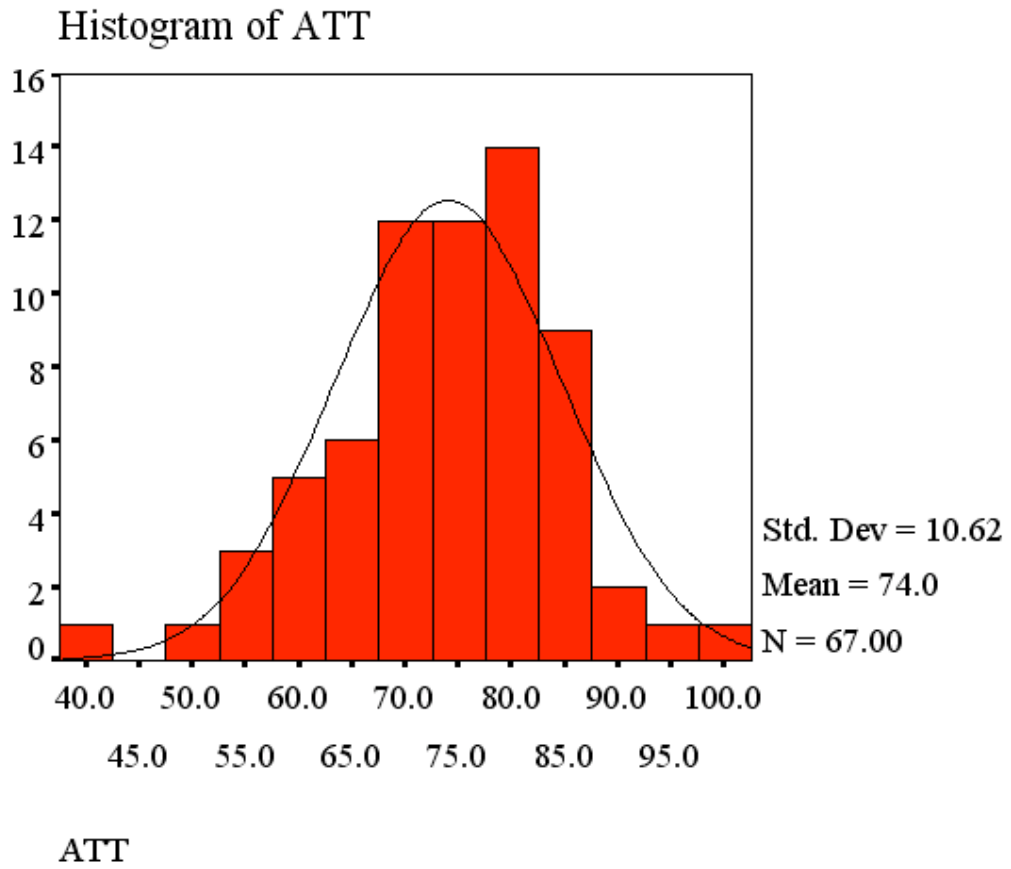
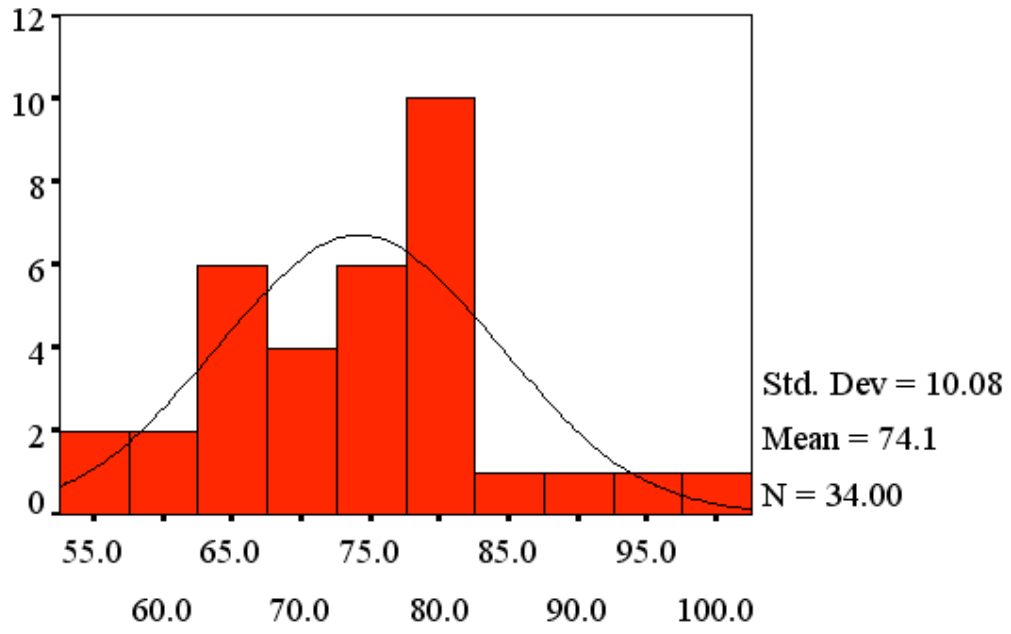


Figure 4

Histogram Distribution of Attitude Toward the Web Scores for Both Topics

Histogram of ATT

Money Track



ATT

Figure 5

Histogram Distribution of Attitude Toward the Web Scores for Money

Histogram of ATT

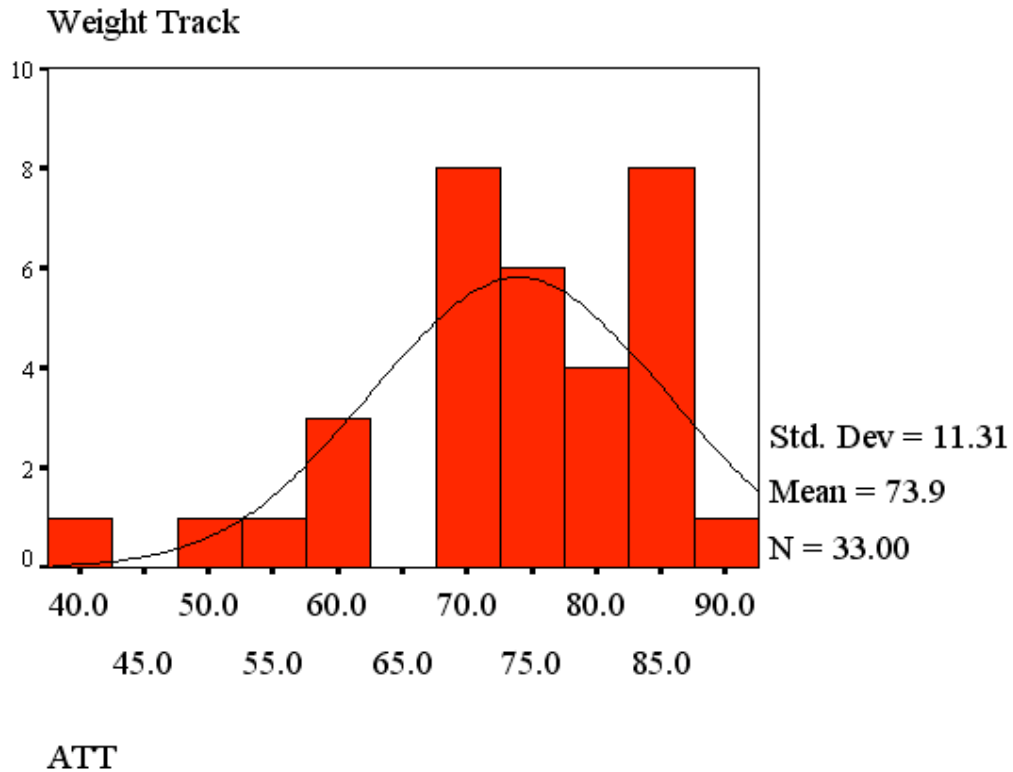


Figure 6

Histogram Distribution of Attitude Toward the Web Scores for Weight

Distribution of Dependent Variables

The distribution of the dependent variables length of text (Table 11), number of pages viewed (Table 12) and time on site (Figure 7) are presented in this section. They present a composite picture of students preferring shorter pages, viewing few pages, with a wide range of time spent on the site but with 82% spending less than six minutes total on the site.

Table 11

Initial Choice of Length of Page for Both Topics, Money and Weight

	Number of Respondents		
	Short	Long	Total
Both Topics	51	16	67
Money	25	9	34
Weight	26	7	33

Table 12

Number of Pages Viewed for Both Topics, Money and Weight

	Mean	<i>SD</i>	Minimum	Maximum	<i>n</i>
Both Topics	5.51	4.55	1	23	67
Money	6.18	5.42	1	23	34
Weight	4.82	3.38	1	12	33

The mean number of pages viewed for the money and weight tracks are not significantly different, $t(55.53) = 1.24, p = .222$.

The number of times each page was chosen is presented in Figure 7. A single page was viewed in 22.4% of the cases with 50.7% viewing 4 or fewer pages.

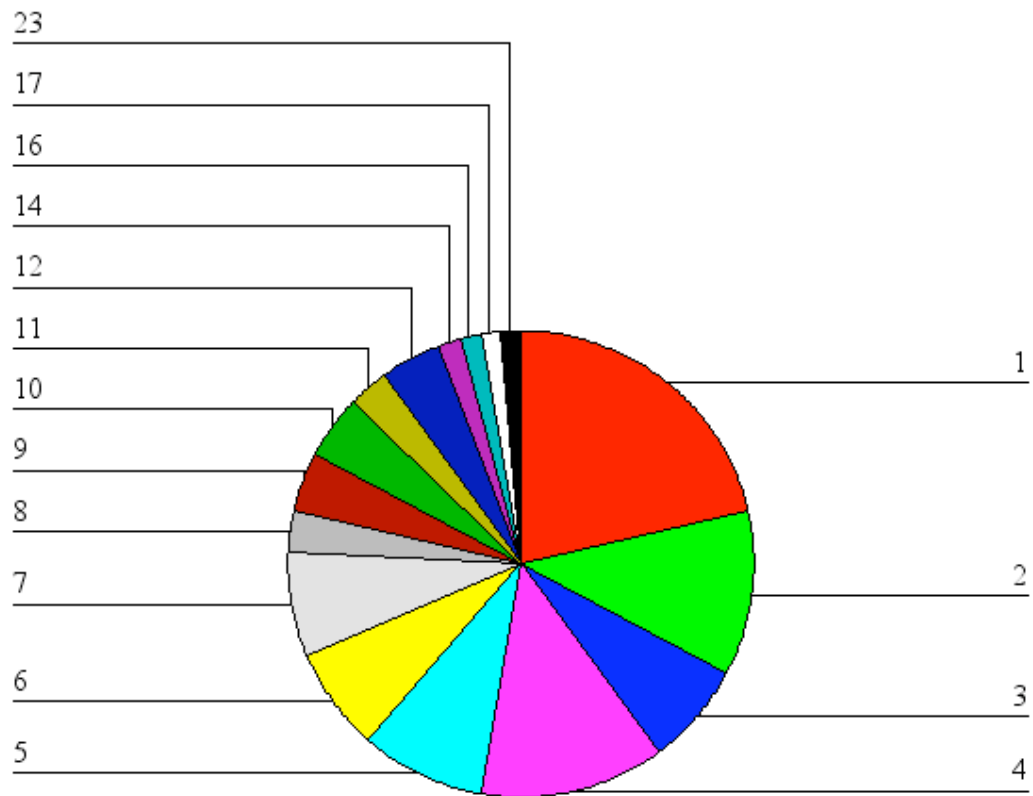


Figure 7

Number of Pages Viewed

The time on site for both topics and money and weight separately is presented in Table 13. The mean times on site for the money and weight tracks are not significantly different, $t(65) = .25, p = .804$.

Table 13

Time on Site for Both Topics, Money and Weight

	Time in Seconds				
	Mean	<i>SD</i>	Minimum	Maximum	<i>n</i>
Both Topics	243.28	199.62	8	1036	67
Money	249.32	230.95	8	1036	34
Weight	237.06	164.34	26	564	33

Test of Hypotheses

This section presents the data analysis for each of the hypotheses. For all analyses, the data file is split according to track (money or weight) and analyzed as a whole, yielding three sets of results for each test (both, money, weight).

Hypothesis 1

Hypothesis 1: Readers with high involvement with a topic will be more likely to read longer text versions of an expository text than readers with low involvement.

Subjects were grouped based on whether they selected the short or long version of the initial page upon entering the site. The *t* test of independent means was used to analyze the whole group to determine whether involvement affected choice of text length for the complete sample. In addition to the analyses by track, mean involvement scores were compared for both money and weight tracks. The hypotheses were directional and therefore a one-tailed test was used. Results are presented in Table 14.

Table 14

Involvement Scores by Text Length

		Text Length								
		Short			Long			1-tail <i>t</i> test		
	Track	<i>n</i>	Mean	<i>SD</i>	<i>n</i>	Mean	<i>SD</i>	<i>t</i>	<i>p</i>	<i>ES</i>
H1	Both	51	51.7	13.2	16	57.6	8.7	1.65	.52	0.26
H1(a)	Money	25	53.3	8.7	9	57.2	10.2	1.10	.140	0.20
H1(b)	Weight	26	50.2	16.4	7	58.0	7.2	1.85	.038	0.29

A significant correlation ($p \leq .038$) was found for the weight track while no significant correlation was found for the money track. The sample as a whole approached significance ($p \leq .052$).

Hypothesis 1 was partially confirmed.

Hypothesis 2

Hypothesis 2: Readers with a positive attitude toward the Web will be more likely to read longer text versions of an expository text than readers with a negative attitude toward the Web.

Subjects were grouped based on whether they selected the short or long version of the initial page upon entering the site. The *t* test of independent means was used to analyze the whole group to determine whether attitude affected choice of text length for the complete sample. In addition to the analyses by track, mean attitude scores were compared for both money and weight tracks. The hypotheses were directional and therefore a one-tailed test was used. Results are presented in Table 15.

Table 15

Attitude Scores by Text Length

		Text Length								
		Short			Long			1-tail <i>t</i> test		
Track	<i>n</i>	Mean	<i>SD</i>	<i>n</i>	Mean	<i>SD</i>	<i>t</i>	<i>p</i>	<i>ES</i>	
H1	Both	51	73.59	10.8	16	75.4	10.2	.58	.285	0.09
H1(a)	Money	25	72.6	9.2	9	78.3	11.8	1.49	.073	0.26
H1(b)	Weight	26	74.54	12.3	7	71.57	6.5	1.85	.273	0.15

No significant difference was found in attitude scores. Hypothesis 2 was not confirmed.

Hypothesis 3

Hypothesis 3: Readers with high involvement with a topic will be more likely to click on links leading to more information and features such as reviews and message boards than readers with low involvement.

A Pearson product moment correlation analysis was conducted to determine the relationship between the involvement score and the number of pages accessed (Table 16). A difference approaching significance was found for the sample as a whole ($p = .062$) and a significant difference for the weight track ($p = .046$) though no significant correlation was found for those accessing the money track.

Table 16

Involvement in Web Site Topics and Number of Pages

	<i>n</i>	Pearson correlation	Significance (1-tailed)	Significance (2-tailed)
Both Topics	67	$r = -.2295$	$p = .031$	$p = .062$
Money	34	$r = -.2080$	$p = .119$	$p = .238$
Weight	33	$r = -.3499$	$p = .023$	$p = .046$

Although a significant correlation was found between the number of pages accessed and the level of involvement in the weight track and approached significance in the complete sample, the direction of the correlation was the opposite of that predicted in the hypothesis. The subjects who had lower involvement scores looked at more pages than those with higher involvement scores.

Hypothesis 3 was not confirmed.

Hypothesis 4

Hypothesis 4: Readers with a positive attitude toward the Web will be more likely to click on links leading to more information and features such as reviews and message boards than readers with a negative attitude toward the Web.

A Pearson product moment correlation analysis was conducted to determine the relationship between the attitude score and the number of pages accessed. No significant correlation was found for the complete sample or for those accessing the pages on the money or weight tracks (Table 17).

Table 17

Attitude Toward the Web and Number of Pages Accessed

	<i>n</i>	Pearson correlation	Significance (1-tailed)
Both Topics	67	$r = -.0623$	$p = .309$
Money	34	$r = -.1263$	$p = .239$
Weight	33	$r = .0200$	$p = .456$

Hypothesis 4 was not confirmed.

Hypothesis 5

Hypothesis 5: Readers with high involvement with a topic will spend more time on the site than readers with low involvement.

A Pearson product moment correlation analysis was conducted to determine the relationship between the involvement score and the time spent on the site. No significant correlation was found for the complete sample or for those accessing the pages on the money or weight tracks (Table 18).

Table 18

Involvement in Web Site Topics and Time Spent on Site

	<i>n</i>	Pearson correlation	Significance (1-tailed)
Both Topics	67	$r = -.0018$	$p = .495$
Money	34	$r = .0981$	$p = .291$
Weight	33	$r = -.0954$	$p = .298$

Hypothesis 5 was not confirmed.

Hypothesis 6

Hypothesis 6: Readers with a positive attitude toward the Web will spend more time on the site than readers with a negative attitude toward the Web.

A Pearson product moment correlation analysis was conducted to determine the relationship between attitude toward the Web score and the time spent on the site.

Although the correlation for the money track approached significance, it was the opposite direction of the hypothesized correlation. No significant correlation was found for the complete sample or for those accessing the pages on the weight track (Table 19).

Table 19

Attitude Toward the Web and Time Spent on Site

	<i>n</i>	Pearson correlation	Significance (1-tailed)
Both Topics	67	$r = -.0958$	$p = .221$
Money	34	$r = -.2803$	$p = .054$
Weight	33	$r = .1358$	$p = .226$

Hypothesis 6 was not confirmed.

Additional Analyses

Several additional analyses were conducted to determine whether subscales of the involvement and attitude scales significantly correlated with the dependent variables. The relationship between attitude and involvement scores was explored through a Pearson product moment correlation analysis as was the relationship between amount of time per

page and involvement. Finally, variables from the tracking of Web usage were examined to better determine user behavior.

No significant difference was found for the choice of length for the subscales of the PII (involvement) scale or the ATT (attitude) scale for the money or weight tracks or the sample as a whole. As a result, analyses for all dependent variables are based on the measures as single-dimension scales.

Although no significant correlation between attitude and involvement was found on either the money or weight track, the sample as a whole showed a significant relationship (Table 20).

Table 20

Attitude Toward the Web and Involvement

	<i>n</i>	Pearson correlation	Significance (2-tailed)
Both Topics	67	$r = .28$	$p = .02$
Money	34	$r = .31$	$p = .07$
Weight	33	$r = .27$	$p = .12$

Several of the demographic variables correlated strongly with attitude (Table 21) but no correlation was found between these same variables and involvement.

Table 21

Attitude Toward the Web and Demographic Variables

	<i>n</i>	Pearson correlation	Significance (2-tailed)
Familiarity	67	$r = .59$	$p < .0005$
Proficiency	67	$r = .54$	$p < .0005$
Hours	67	$r = .49$	$p < .0005$
Use	67	$r = .60$	$p < .0005$

To determine whether involvement was related to time spent on each page, a Pearson product moment correlation analysis was conducted (Table 22).

Table 22

Involvement and Seconds Per Page

	<i>n</i>	Pearson correlation	Significance (1-tailed)
Seconds per Page	67	$r = .22$	$p = .038$

To determine whether there was a direct relationship between the total time on site and time spent on each page, a correlation analysis was conducted comparing number of pages with the two variables (Table 23). The time on site corresponded positively with the number of pages viewed, but the amount of time on each page was inversely correlated with the number of pages viewed. This indicates a pattern of examining many pages for a short time each or a few pages more in depth.

Table 23

Number of Pages and Time Variables

	<i>n</i>	Pearson correlation	Significance (2-tailed)
Time on Site	67	$r = .31$	$p = .010$
Seconds per Page	67	$r = -.35$	$p = .004$

Summary

A significant correlation was found between the independent variable of involvement and length of text selected on the weight track ($p < .04$) and approached significance on the sample as a whole ($p < .052$). No correlation was found between the independent variable of attitude toward the Web and involvement with Web site topics and the dependent variables length of text and time spent on the site. There was a positive correlation between the number of pages accessed and involvement with the Web topic for the weight track ($p < .02$) and the sample as a whole ($p < .03$) but in the opposite direction of the hypothesized correlation. No correlation between total time on site and involvement was found.

Additional analyses were conducted and revealed a weak but significant correlation between attitude toward the Web and involvement scores for the sample as a whole ($r = .28, p < .05$). Several demographic variables also correlated strongly with attitude. Finally, various time variables were measured and indicated that seconds per page and involvement were related positively as was time on site. Seconds per page was inversely related to the number of pages viewed.

CHAPTER 5

SUMMARY, DISCUSSION AND CONCLUSIONS

Summary

The purpose of this study was to investigate the nature of the relationship between attitude toward the Web, involvement with a topic presented on the Web and use of a Web site. The choice of different text lengths, the number of pages visited, and the time spent on the site were recorded and studied in relation to attitude and involvement. It was hypothesized that the more positive the attitude toward the Web and the greater the involvement in a topic, the more thoroughly the site would be examined, both in terms of the selection of longer texts and in the number of pages visited and overall time spent on the site. While attitude did not correlate significantly with any of the behavioral factors, the level of involvement was associated with the use of the sites in two of three hypotheses, but only partially in the manner hypothesized. Increased involvement with a Web topic did correlate with the choice of a longer, more detailed initial Web page, but was inversely related to the number of pages viewed so that the higher the involvement, the fewer pages visited. These findings are discussed in more detail in this chapter.

In addition to the primary discussion related to the hypotheses, findings related to various demographic variables such as familiarity and perceived proficiency with the Web and amount of usage are presented and discussed. Also, an additional measure of usage, the average amount of time spent on each page, is examined. A preliminary approach to a model of Web usage related to attitude and involvement is explored. The chapter concludes with limitations and delimitations along with the relationship of findings to related research and suggestions for further studies in this area.

Discussion

Findings regarding involvement (Hypotheses 1, 3, and 5) are presented according to hypothesis while those dealing with attitude (Hypotheses 2, 4 and 6) are discussed as a group in relation to a more comprehensive discussion of the overall study.

Involvement and Page Choice

Hypothesis 1 predicted a positive association between involvement as measured by the Personal Involvement Inventory (PII), an instrument used traditionally to measure involvement with a product, advertisement, or purchase decision and the choice of page length, either abbreviated or detailed. The assertion that users prefer short, bullet-pointed text over narrative text is a common one (e.g., Nielsen, 1997; Morkes & Nielsen, 1997), and is largely supported in this study with over three-fourths of students selecting the shorter, bullet-pointed version. However, when correlated with involvement scores, those students accessing the weight topic site with high involvement scores tended to access the longer version of the page, while the correlation of the sample overall approached significance. This finding corresponds with the literature regarding information seeking related to involvement with products (Celsi & Olson, 1988). Although no firm conclusions can be drawn due to the mixed results and the near significance of the overall finding, it appears that the Personal Involvement Inventory may be used to advantage to further study user preferences for Web page length.

Involvement and Number of Pages Visited

While the first hypothesis appears to support the literature on information use in involvement studies, Hypothesis 3, which posited that users with high involvement in a topic would examine more pages, produced unexpected results. Contrary to expectations,

the relationship between involvement and number of pages was inversely related, with high involvement users actually using fewer pages.

One possible explanation for this finding is found in the literature on motivation and interest in reading a text. Kintsch (1980) suggests that a linear model of interest in reading a particular text does not adequately account for motivation to read, which is augmented or diminished by a person's knowledge of the topic, expectation generated during the reading process, and whether any incongruities in the text—information that fills a knowledge gap—exist. Kintsch's nonmonotonic model suggests that readers with a low interest in a topic, which is a fundamental aspect of involvement, will read a limited amount, gradually increasing with interest until a certain point at which the motivation to read decreases due to the reader's knowledge of the topic and lack of expectation of obtaining new information. While a linear model of the association between involvement and number of pages approached significance in the opposite direction of the prediction and does not match Kintsch's model in full, his model suggests a plausible explanation for the lack of a significant finding as hypothesized. Further studies of involvement and use of Web pages is required to draw any firm conclusions.

Another possible explanation is that the level of knowledge associated with involvement with a topic allows the user to more effectively browse the site “making glimpses” of the pages to determine their value (O'Connor, 1993, p. 223), or more globally, the perceived value of the site as a whole. The person with less knowledge of the topic may have to sample more pages before determining their value. In fact, the post hoc analysis of average time per page and its inverse relationship to the number of pages visited would support this notion. Users visiting fewer pages, which in this case signifies

higher involvement, spent more time on each page. If this is the case, then an increase in involvement with a topic correlates positively with depth of processing related to that topic. This finding is consistent with studies that indicate that depth of processing was related to level of involvement (Maheswaran & Meyers-Levy, 1990; Celsi & Olson, 1988).

It is also possible that the extensive exposure to the Web of the students created certain expectations of presentation and functionality lacking in the test site and that the very simplicity of the page design decreased the motivation of those with low involvement to use the site. Zaichkowsky (1994) observed the relationship between aspects of the medium and the topic of the message when using the Personal Involvement Inventory for advertising research:

Therefore, one does not necessarily have to be involved with the product category to be involved with an ad for any product. Other non-product aspects of the ad (e.g., music, scenery, or message) may raise the level of involvement with the ad because of their relevance to the viewer. (Zaichkowsky, 1994, Test-Retest Reliability Section).

While Zaichkowsky discusses the increasing involvement with the medium, it is reasonable to assume that non-topic aspects of the site may have a proportionally greater effect when the perceived relevance of the topic itself is lower than for those who see the topic as highly relevant. Cho and Leckenby (2000) found this to be the case with banner advertisements and click-through behavior. Consumers with high involvement were more likely to click on banner ads to request more information, but low involvement users

were more likely to click on large banner ads with dynamic animation. Evidence of students making a quick judgment of the value of the pages may be seen in the large proportion of students who looked at only one page before leaving the site. Fully one-fourth of the students exhibited this behavior. This browsing of the site to assess its value for further exploration may have resulted in low involvement users judging the value of the site to not be worth the effort to read in depth or examine more pages. A useful extension to the study would be to control for other aspects of the site such as graphic presentation as well as text format.

Involvement and Time on Site

Hypothesis 5 suggested that those more highly involved in a topic would spend more time examining the site. No significant association may be made between time on site and involvement based on this study. Time spent on the site is a function of the number of pages and how long each page was viewed, however, and therefore another explanation for the behavior should be considered. Although total time spent on the site did not correlate with involvement with the topic, possibly due to the inverse relationship between involvement and number of pages viewed, the amount of time spent on average per page did correlate positively with involvement as discussed previously. This finding suggests that involvement is related to the time processing information on a site, but at a page level instead of a site level, indicating the consideration of a breadth versus depth perspective related to involvement.

Breadth and depth provide a rubric for thinking about use of information on the Web, but the distinction between the two does not signify a clear dichotomy of mutually exclusive behaviors. Wineburg (1997) points out that aspects of depth of knowledge in a

domain and the connections between depth and breadth are closely intertwined especially for the person knowledgeable about a topic. Depth and breadth interact with each other in a way that permits a user with extensive knowledge of a domain to make connections between the two in a way unavailable to a less knowledgeable person. This knowledgeable person is able to “separate the peripheral from the central, can see the forest for the trees, and possesses knowledge organized in interconnecting networks of meaning and significance” (Wineburg, 1997, p. 257). These apply to information seeking and processing on a Web page in that an experienced, knowledgeable reader may more effectively know how to make judgements about the usefulness of different sections and be able to place them in the context of a larger framework or schema of the topic. This perspective echoes the earlier discussion of how scholars browse and select material for further use (O’Connor, 1993).

The depth versus breadth concept also points to the different ways that previous knowledge may affect how a site is used. A person with little knowledge may read the site to gain general understanding of a topic whereas a knowledgeable reader may read to find out how to integrate the information about a topic with an existing framework of understanding, to determine the credibility of assumptions made in the writing, or even to see how the writer or creator of the Web site arrived at the conclusions reached in the writing. All of this suggests that a perspective of depth and breadth may be useful in describing Web browsing behavior. Whether efficiency is a primary factor as it is in the artificial intelligence literature, which is concerned with algorithms to sample a domain in a breadth-first or depth-first manner (e.g., Russell and Norvig, 1995, Chapter 3), or

whether other factors such as interest and motivation are at play, or both, much is left to be discovered about the unobservable connections being made internally by the reader.

Browsing behavior may also be a confounding factor in the discussion of involvement and time on site. Post hoc analysis of tracking measures indicates, not surprisingly, a positive correlation between number of pages viewed and total time on site. Less intuitive is the distribution of pages by time per page as measured in seconds. The relationship in this case is inversely proportional. In other words, the more pages visited, the less time per page, and vice versa. The behavior of those spending little time on each page was noted in the literature review as one of those observed by Lawless and Kulikowich in studies of hypertext users (1998). The authors identified these users as apathetic hypertext users, and noted their tendency to use only short intervals of time to interact with the text. A more granular analysis of pages visited would enhance understanding of how navigation patterns interact with involvement, but it appears that apathetic hypertext users and users with low involvement with a topic may be alternate terms for the same phenomenon.

Attitude and Behavior

No significant relationship between attitude and the dependent variables was found in any of the three hypotheses. It is possible that there was an indirect relationship as seen in the positive significant correlation between attitude and involvement ($p \leq .02$) found in a post hoc correlation analysis. Alternatively, it may be that attitude is more closely related to the decision whether or not to use the Web rather than another medium, which is congruent with the uses and gratification literature (Hunter, 2001; Korgaonkar & Wolin, 1999; Ko, 2000). Giving students a different means of accessing the same

information would allow this question to be addressed. In the current study, however, no conclusions can be drawn as to the reasons for the lack of association between attitude and page choice, number of pages viewed, or time on the site.

Although the data related to the primary attitudinal hypotheses does not provide an explanation for the lack of association between attitude and behavior, additional analyses of demographic variables suggests that attitude is related to these variables. These analyses indicate a strong correlation between access to the Web, proficiency with its use, perceived amount of use and reported number of hours used per week and attitude toward the Web. This suggests that attitude toward the Web may be an antecedent of involvement with a topic presented on the Web. This appears to have some support in the current sample, though the significant correlation between involvement and attitude scores can only be used cautiously. Figure 8 shows the relationship between the demographic variables based on path analysis with partial correlations.

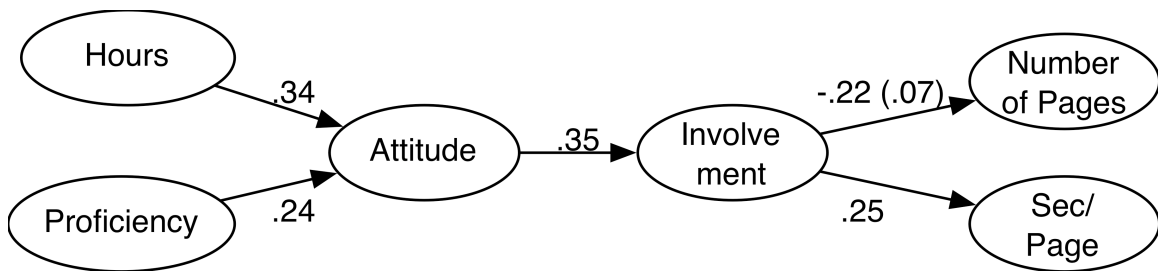


Figure 8

Path Analysis with Partial Correlations

This predicted path analysis is supplemental to the primary purpose of the study and requires further research to validate its applicability. However, it appears to indicate that ability and availability factors are precursors to attitude toward the Web, which in

turn underlies involvement with a Web topic, which is then related to actions or behavior. In the current study, those actions are number of pages examined and depth of page processing as indicated by time in seconds on each page. The indicators of hours and proficiency suggest a construct of prior experience and the number of pages and seconds on each page suggest a construct of information processing behavior. The hypothetical model derived from these partial correlations, taken as a whole, is shown in Figure 9. Further research is needed to determine the validity of this model.

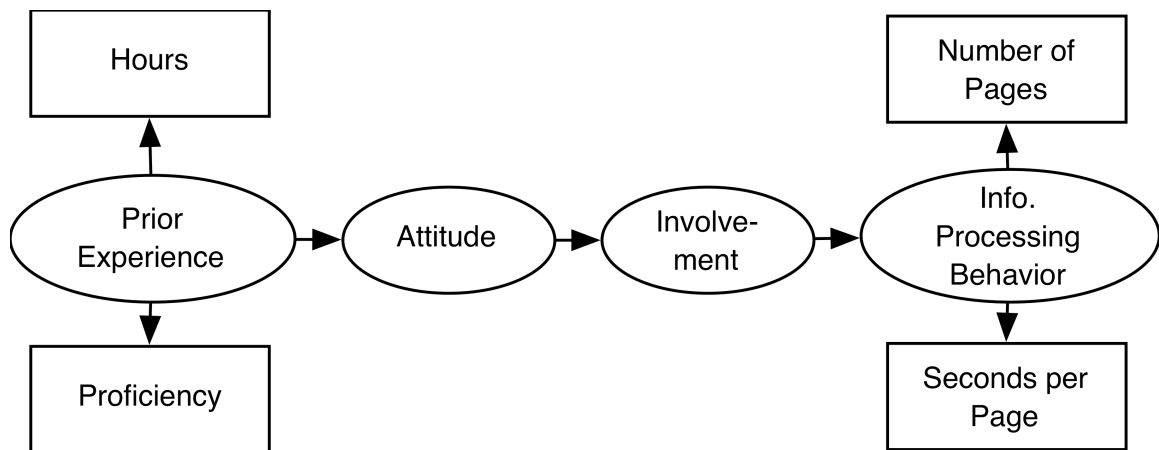


Figure 9

Model of Web Interaction

Students participating in this study proceeded from general to specific in terms of the Web. First students self reported their attitude toward the Web in general, subsequently their involvement with a specific topic presented on the Web, and finally acted on a particular Web site. Condensing the factors presented in the path analysis with partial correlations above, Figure 10 depicts a potential framework within which to consider the results of the study.

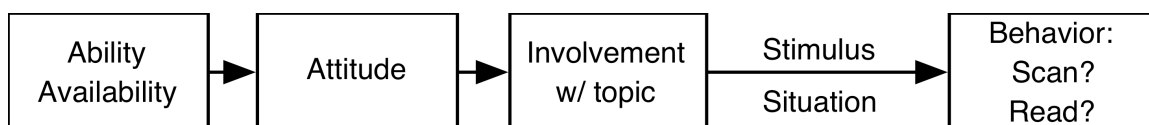


Figure 10

Factors Contributing to Web Page Decisions

The junction between self-reported involvement and actual use holds special interest because it is at this point that the students first saw one of the Web pages about a topic. Until this point, any report of involvement with the Web topic, either weight or money, was based on previous experience with the topic on a previously used Web site, the topic outside the presentation on the Web, or a mental model of characteristics of a site providing information on the topic under consideration. Zaichkowsky (1985) enumerates three antecedents of involvement: characteristics of the person, characteristics of the stimulus and characteristics of the situation. The involvement reported at this point is not that of the student with the pages in the study, or the stimulus, and so does not depend on characteristics of the stimulus, i.e., the Web pages themselves. The situation is not manipulated to increase or decrease involvement, and so does not depend on the situation. Therefore, the involvement under consideration is what Celsi and Olson (1988) call Intrinsic Sources of Personal Relevance, or ISPR and is related to long-term felt involvement. This isolation of one type of involvement contributes to the study of use of the Web because it provides an instrument to measure a baseline of interest and motivation, which then allows a clearer control of factors related to the situation or the stimulus. It also suggests areas of focus for future research on involvement and reading on the Web.

Limitations and Delimitations

In addition to the limitations discussed in the context of specific findings, the study has several limitations related to the study as a whole.

Instrumentation

The primary instrument for attitude was designed specifically for the Web, but the Personal Involvement Inventory has its roots in product and advertising research. Although it demonstrated a high reliability and it has been used for other information-related topics, its validity specifically for use on Web topics has not been established.

Subjects

The generalizability of findings in the study is limited due to the proportionally greater access and familiarity of college students with the Web compared to the population as a whole.

Materials and Methodology

Students' reaction to a simple, graphically poor site may differ substantially from that exhibited to popular sites on the Internet.

It is also possible that the topics were not adequately described or that one description of the topic may have conflicted with another of the descriptive terms. For example, the weight topic included both fitness and weight loss as descriptors. The person vitally interested in weight loss may see information on the topic as a necessary evil (and therefore high on the importance scale) whereas the athlete may love exercise and read the information for enjoyment, potentially resulting in different involvement scores and different behaviors. In addition, while prompts for both topics had descriptive terms in parentheses, the prompt on the PII measure had an additional qualifier,

describing the weight topic as “losing weight (diet, exercise, etc.)” but only “money (saving, investing, etc.” for the money track. The lack of consistency in the findings of significant and near-significant correlations for weight and not money may have been due to the additional qualifier of “losing” for weight without a parallel qualifier for money.

The laboratory setting provides tracking of browsing behavior and control of pages accessed, but imposes its own limitations. The necessity of limiting browsing on the Web may seem overly restrictive to users accustomed to ranging far and wide, constructing their own version of the Web in the manner of hypertext users creating their own texts by the choices they make (Tuman, 1992). When a page is deemed worth reading, constraints placed by the experiment may influence how the page is read as well. Kintsch (1980) observes that the internal processes we utilize in reading “will of course be vastly more complex than those obtained in simplified laboratory situations” (p. 96).

Suggestions for Further Research

Suggestions for further research center around the manipulation of the components of the model presented in Figure 9, both as an organizing principle and as a means of determining its validity.

For the ability and availability component, measuring the users’ knowledge of a topic would provide understanding into how expertise and involvement interact to affect actions. For the stimulus component, characteristics of the Web page itself, and the impact of these characteristics on low-involvement and high-involvement users is another area that would glean useful insight for information providers. A more granular examination of the actions component by categorizing types of pages and viewing the

patterns through the site would illuminate which types of Web features are associated with longer visits on individual pages and the site as a whole.

While research into these variables should provide insight, it is important to maintain emphasis on the user, focusing on how each component affects or is affected by involvement. This suggests a broadening of the research to include situational sources of personal relevance, or SSPR (Celsi and Olson, 1988). This study has focused on measurement of the long-term, intrinsic sources of personal relevance (ISPR) in order to focus on users rather than systems. Manipulating situational sources of personal relevance, however, would have the advantage of more closely mirroring existing studies of message involvement in particular. It would also provide a more complete understanding of the interaction between long-term interest in a topic and that brought about by characteristics of the source or the situation.

Manipulation of the situational variable could be realized by changing the reason for using a Web site. SSPR could be manipulated by the expectation of an exam over the topic, the promise of a reward, or the altering of the introductory materials to increase the relevance of the topic to the user.

Conclusion

While studies of involvement in products have tended to measure involvement as conceived against an idealized product, studies involving messages such as advertising, have studied reactions to specific manipulations of the message. By measuring involvement against a mental model of a Web site (Dillon, 1991) or an idealized Web site on a topic and relating it to actual behavior on the Web site, this study has extended the use of the Personal Involvement Inventory and has added to evidence of earlier studies

that utilizing the measure for research into the use of technology is a valid use of the instrument (e.g., Knezek & Christensen, 1998; Knezek, Christensen, Miyashita, & Ropp, 2000).

The study appears to confirm research that indicates that involvement is related to the depth of information processing, suggesting that while more highly involved users may read fewer pages, they spend more time processing those pages. This has potential application for information seeking studies that seek to understand choices made by more formal searches of traditional information tools. Moving in the other direction, from the traditional to the new, the study operationalizes O'Connor's (1993) discussion of scholarly browsing behavior, applying it to the more pedestrian activity of students browsing Web pages.

Nielsen's (1997) oft-quoted assertion that users prefer shorter, bullet-point formatted pages is supported, though the findings diverge from his studies when the interests and motivation of the readers is factored into the equation. It may be that choice of abbreviated or detailed pages should be made available to users, perhaps defaulting to one or the other where the level of involvement is known.

Finally, corollary findings provide a potential framework for more clearly defining components of a model of factors leading up to the actual browsing or reading of pages on the Web. This emphasis on the human aspect of Web use should serve a complementary role to studies focusing on characteristics of the Web medium.

The purpose of this study was to expand the knowledge of how college students use the Web by relating attitude toward the Web and involvement with behavior when using a Web site. Due to its prominence in education, business, entertainment, medicine,

and practically every aspect of life, increasing understanding of why people choose to browse or read a Web site, how they navigate, and factors that relate to increased usage is an important research topic. By extending the use of involvement to the study of the Web, it is hoped that this study has contributed to the overall understanding of this important source and channel of information.

APPENDIX A
RESEARCH CONSENT FORM

**UNIVERSITY OF NORTH TEXAS COMMITTEE FOR
THE PROTECTION OF HUMAN SUBJECTS**

RESEARCH CONSENT FORM

Subject Name: _____

Date: _____

Title of Study: _____

Accessing Information on the Web: Predicting Usage Based on Involvement

Principal Investigator: James D. Langford

Co-investigators: Faculty Sponsor, Dr. Gerald Knezek (940) 565-4195

Before agreeing to participate in this research study, it is important that you read and understand the following explanation of the proposed procedures. It describes the procedures, benefits, risks, and discomforts of the study. It also describes your right to withdraw from the study at any time. It is important for you to understand that no guarantees or assurances can be made as to the results of the study.

Purpose of the study and how long it will last:

This study is intended to determine the relationship between involvement, similar to motivation and interest, and use of the World Wide Web. While the research may be conducted over the course of more than one semester, individual involvement is limited to the one-time use of a web site and response to survey-questionnaires.

Description of the study including the procedures to be used:

You will be asked to provide demographic information and take two online survey-questionnaires with 30 total questions and then browse a web site. Your actions (clicks only) while browsing will be recorded and timed.

Description of procedures/elements that may result in discomfort or inconvenience:

You should not be subjected to any procedure that results in discomfort or inconvenience.

Description of the procedures/elements that are associated with foreseeable risks:

You should not be subjected to any risk associated with the completion of this survey-questionnaire.

Benefits to the subjects or others:

No direct benefit.

Research Consent Form -Page 1 of 2 _____ Participant's initials

UNIVERSITY OF NORTH TEXAS RESEARCH CONSENT FORM (Continued)

Confidentiality of research records:

There will be no attempt to obtain the identity of any individual participant in the study. The results of any individual survey-instrument will not be attributable to an individual and individual student's results will not be shared with the instructor of this class.

Review for protection of participants:

This research study has been reviewed and approved by the UNT Committee for the Protection of Human Subjects (940) 565-3940.

RESEARCH SUBJECTS' RIGHTS: I have read or have had read to me all of the above.

James Langford has explained the study to me and answered all of my questions. I have been told the risks or discomforts and possible benefits of the study.

I understand that I do not have to take part in this study, and my refusal to participate or to withdraw will involve no penalty or loss of rights or benefits or legal recourse to which I am entitled. The study personnel may choose to stop my participation at any time.

In case there are problems or questions, I have been told I can call the faculty advisor, Dr. Gerald Knezek at (940) 565-4195).

I understand my rights as a research subject, and I voluntarily consent to participate in this study. I understand what the study is about and how and why it is being done. I have been told I will receive a signed copy of this consent form.

_____	_____
Subject's Signature	Date
_____	_____
Witnesses' Signature	Date

For the Investigator or Designee:

I certify that I have reviewed the contents of this form with the person signing above, who, in my opinion, understood the explanation. I have explained the known benefits and risks of the research.

_____	_____
Principal Investigator's Signature	Date

APPROVED BY THE UNT IRB
FROM 3/15/02 TO 3/14/03
JB

APPENDIX B

RESEARCH INFORMATION LETTER

UNIVERSITY OF NORTH TEXAS COMMITTEE FOR
THE PROTECTION OF HUMAN SUBJECTS

RESEARCH INFORMATION LETTER

Title of Study: Accessing Information on the Web: Predicting Usage Based on Involvement

Principal Investigator: James D. Langford

Co-investigators: Faculty Sponsor, Dr. Gerald Knezek (940) 565-4195

Before agreeing to participate in this research study, it is important that you read and understand the following explanation of the proposed procedures. It describes the procedures, benefits, risks, and discomforts of the study. It also describes your right to withdraw from the study at any time. It is important for you to understand that no guarantees or assurances can be made as to the results of the study.

Purpose of the study and how long it will last: This study is intended to determine the relationship between involvement, similar to motivation and interest, and use of the World Wide Web. While the research may be conducted over the course of more than one semester, individual involvement is limited to the one-time use of a web site and response to survey-questionnaires.

Description of the study including the procedures to be used: You will be asked to provide demographic information and take two online survey- questionnaires with 30 total questions and then browse a web site. Your actions (clicks only) while browsing will be recorded and timed.

Description of procedures/elements that may result in discomfort or inconvenience: You should not be subjected to any procedure that results in discomfort or inconvenience.

Description of the procedures/elements that are associated with foreseeable risks: You should not be subjected to any risk associated with the completion of this survey-questionnaire.

Benefits to the subjects or others: No direct benefit.

Confidentiality of research records: There will be no attempt to obtain the identity of any individual participant in the study. The results of any individual survey-instrument will not be attributable to an individual and individual student's results will not be shared with the instructor of this class.

Review for protection of participants: This research study has been reviewed and approved by the UNT Committee for the Protection of Human Subjects (940) 565-3940.

RESEARCH SUBJECTS' RIGHTS:

You have the right to have the study explained and any questions answered.

You do not have to take part in this study, and your refusal to participate or to withdraw will involve no penalty or loss of rights or benefits or legal recourse to which you are entitled. The study personnel may choose to stop your participation at any time.

In case there are problems or questions, you can call the faculty advisor, Dr. Gerald Knezek at (940) 565-4195, or me at (915) 674-2855.

By continuing the study, you are voluntarily consenting to participate in this study and affirming that you understand what the study is about and why it is being done.

APPROVED BY THE UNT IRB
FROM 4/19/02 TO 4/18/03
JB

APPENDIX C

PERSONAL INVOLVEMENT INVENTORY

STUDENT QUESTIONNAIRE

Personal Involvement Inventory (adapted)

Instruction Page

Instructions

The purpose of this study is to measure a person's involvement or interest in (topic). To take this measure, we need you to judge information on Web pages against a series of descriptive scales according to how YOU perceive the topic on the Web page you will be shown. Here is how you are to use these scales:

If you feel that the topic that appears at the top of the page is very closely related to one end of the scale, you should click the button as follows:

Unimportant x: Important

or

Unimportant x Important

If you feel that the (topic) seems only slightly related (but not really neutral) to one end of the scale, you should place your check mark as follows:

Uninterested x: Interested

Uninterested x: Interested

Make each item a separate and independent judgment. Work at fairly high speed through this questionnaire. Do not worry or puzzle over individual items. It is your first impressions, the immediate feelings about the items, that we want. On the other hand, please do not be careless, because we want your true impressions. Any questions?

Scale Page

*important unimportant
boring interesting
*relevant irrelevant
*exciting unexciting
*appealing unappealing
means nothing means a lot to me
*fascinating mundane
worthless valuable
*involving uninvolving
not needed needed

* Indicates item is reverse scored.

Items on the left are scored (1) low involvement to (7) high involvement on the right.

TOTALING THE 10 ITEMS GIVES A SCORE FROM A LOW OF 10 TO A HIGH OF 70.

APPENDIX D

ATTITUDE TOWARD THE WEB

ATTITUDE TOWARD THE WORLD WIDE WEB QUESTIONNAIRE

This section of the survey gathers general information about your attitudes towards the World Wide Web.

Below are a series of statements. There are no correct answers to the statements. They are designed to permit you to indicate the extent to which you agree or disagree with the ideas expressed. Please read each statement and circle the number that indicates how strongly you agree or disagree with the statement.

1. Soon our lives will be dominated by the World Wide Web.
strongly disagree 1 2 3 4 5 strongly agree

2. The World Wide Web turns people into just another number.
strongly disagree 1 2 3 4 5 strongly agree

3. The World Wide Web is lessening the importance of too many jobs now done by humans.
strongly disagree 1 2 3 4 5 strongly agree

4. People are becoming slaves to the World Wide Web.
strongly disagree 1 2 3 4 5 strongly agree

5. The World Wide Web is dehumanizing society.
strongly disagree 1 2 3 4 5 strongly agree

6. The overuse of the World Wide Web may be harmful and damaging to humans.
strongly disagree 1 2 3 4 5 strongly agree

7. Soon our world will be completely run by the www.
strongly disagree 1 2 3 4 5 strongly agree

8. The www will replace the need for working human beings.
strongly disagree 1 2 3 4 5 strongly agree

9. The www is bringing us into a bright new era.
strongly disagree 1 2 3 4 5 strongly agree

10. The use of the World Wide Web is enhancing our standard of living.
strongly disagree 1 2 3 4 5 strongly agree

11. Life will be easier and faster with the www.
strongly disagree 1 2 3 4 5 strongly agree

12. The www is a fast and efficient means of getting information.
strongly disagree 1 2 3 4 5 strongly agree
13. There are unlimited possibilities for application of the www that haven't even been thought of yet.
strongly disagree 1 2 3 4 5 strongly agree
14. The www is responsible for many of the good things we enjoy.
strongly disagree 1 2 3 4 5 strongly agree
15. The www can eliminate a lot of tedious work for people.
strongly disagree 1 2 3 4 5 strongly agree
16. The www makes me uncomfortable because I don't understand it.
strongly disagree 1 2 3 4 5 strongly agree
17. I feel intimidated by the www.
strongly disagree 1 2 3 4 5 strongly agree
18. The www intimidates me because it seems so complex.
strongly disagree 1 2 3 4 5 strongly agree
19. The www is difficult to understand.
strongly disagree 1 2 3 4 5 strongly agree
20. The www is frustrating to work with.
strongly disagree 1 2 3 4 5 strongly agree

APPENDIX E
DEMOGRAPHIC INFORMATION

DEMOGRAPHIC INFORMATION

All responses to this survey are kept confidential.

1. Gender: (a) ___ Male (b) ___ Female

2. Age:

(a) ___ 18-24

(b) ___ 25-29

(c) ___ 30-34

(d) ___ 35-39

(e) ___ 40-44

(f) ___ 45-49

(g) ___ 50-54

(h) ___ 55-64

(i) ___ 65 and over

3. How many hours per week do you use the Web? _____

4. Which of the following best describes your access to the Web?

(a) ___ unlimited access to one or more computers for my personal use

(b) ___ shared access with another person in my dorm or household

(c) ___ access only outside my residence

5. How familiar are you with the Web?

Not familiar at all 1 2 3 4 5 Very familiar

6. What would you say is your level of proficiency on the Web?

Not proficient at all 1 2 3 4 5 Very proficient

7. What would you say is your level of usage of the Web?

Very little 1 2 3 4 5 Use it a lot

REFERENCE LIST

- ASIST award of merit bestowed upon Patrick G. Wilson. (2002). Bulletin of the American Society for Information Science and Technology, (December/January 2002), 9-11.
- Adler, A., Gujar, A., Harrison, B. L., O'Hara, K., & Sellen, A. (1998). A diary study of work-related reading: design implications for digital reading devices. Proceedings of CHI '98 (pp. 241-247). New York: ACM Press.
- Andrews, J. C., Durvasula, S., & Akhter, S. H. (1990). A framework for conceptualizing and measuring the involvement construct in advertising research. Journal of Advertising, 19(4), 27-40.
- Baldwin, S. R., Peleg-Bruckner, Z., & McClintock, A. H. (1985). Effects of topic interest and prior knowledge on reading comprehension. Reading Research Quarterly, 20(4), 497-504.
- Borgman, C. L. (1992). The convergence of Information Science and Communication: A bibliometric analysis. Journal of the American Society for Information Science, 43(6), 397-411.
- Celsi, R. L., & Olson, J. C. (1988). The role of involvement in attention and comprehension processes. Journal of Consumer Research, 15, 210-224.

- Charney, D. (1987). Comprehending non-linear text: the role of discourse cues and reading strategies. ACM Proc. of Hypertext '87 (pp. 70-80).
- Cho, C.-H., & Leckenby, J. D. (2000) The effectiveness of banner advertisements: involvement and click-through [Web Page]. URL http://www.ciadvertising.org/studies/reports/info_process/AEJMC-involvement&clicking-allinone.htm.
- Cooter, Robert and E. Sutton Flynt. Teaching Reading in the Content Areas. Englewood Cliffs, New Jersey: Prentice-Hall, 1996.
- DeVellis, R. F. (1991). Scale Development. Newbury Park, NJ: Sage Publications.
- Dijk, T. A. v., & Kintsch, W. (1983). Strategies of discourse comprehension. New York: Academic Press.
- Dillon, A. (1991). Readers' models of text structures: The case of academic articles. International Journal of Man Machine Studies, (35), 913-925.
- Dillon, A. (1994). Designing usable electronic text ergonomic aspects of human information usage. London, Bristol, PA: Taylor & Francis.
- Esperet, E. (1996). Notes on hypertext, cognition, and language. J.-F. Rouet, European Association for Research on Learning and Instruction, & Conference Hypertext and cognition (pp. 149-155). Mahwah, N.J: Lawrence Erlbaum.
- Feick, L. F., & Price, L. L. (1987). The market maven a diffuser of marketplace information. Journal of Marketing, 51, 83-97.

- Fogg, B., Marshall, J., Laraki, O., Osipovich, A., Varma, C., Fang, N., Paul, J., Rangnekar, A., Shon, J., Swani, P., & Treinen, M. (2001). What makes Web sites credible? A report on a large quantitative study. Proceedings of the SIGCHI conference on human factors in computing systems.
- Gabbott, M., & Hogg, G. (1999). Journal of Business Research, 46, 159-166.
- Garlin, F., & McGuiggan, R. Involvement: revisited and revitalised [Web Page]. URL <http://www.anzmac99.unsw.edu.au/anzmacfiles/G/Garlin.pdf> [2001, December].
- Goldsmith, R. E., & Emmert, J. (1991). Measuring product category involvement a multitrait-multimethod study. Journal of Business Research, 23, 363-371.
- Google advanced search:Find pages that link to the page [Web Page]. URL http://google.com/search?as_lq=http%3A%2F%2Fuseit.com%2Falertbox%2F9710a.html&btnG=Search [1903b, February].
- Google advanced search:Find pages that link to the page [Web Page]. URL http://google.com/search?as_lq=http%3A%2F%2Fuseit.com%2Fpapers%2Fwebwriting%2Fwriting.html&btnG=Search [1903a, February].
- Guthrie, J. T., Wigfield, A., Metsala, J. L., & Cox, K. E. (1999). Motivational and cognitive predictors of text comprehension and reading amount. Scientific Studies of Reading, 3(3).
- Hunter, C. D. The uses and gratifications of the World Wide Web [Web Page]. URL <http://www.asc.upenn.edu/usr/chunter/webuses.html> [2001, October 10].

Kilian, C. (1999). Writing for the Web. Self-Counsel writing series . Bellingham, WA: Self-Counsel Press.

Kim, J., Mueller, Charles W. (1978). Factor analysis statistical methods and practical issues. Series: Quantitative applications in the social sciences. Beverly Hills, CA. Sage Publications.

Kintsch, W. (1980). Learning from text, levels of comprehension, or: Why anyone would read a story anyway. Poetics, 9, 87-98.

Knezek, G., & Christensen, R. (1998). Internal consistency reliability for the teachers' attitudes toward information technology questionnaire. Proceedings of SITE 98 .

Knezek, G., Christensen, R., Miyashita, K., & Ropp, M. (2000). Instruments for assessing educator progress in technology integration. Denton, Texas: Institute for the Integration of Technology into Teaching and Learning, University of North Texas.

Ko, H. (2000). Internet uses and gratifications: understanding motivations for using the Internet. Annual Meeting of the Association for Education in Journalism and Mass Communication .

Korgaonkar, P. K., & Wolin, L. D. (1999). A multivariate analysis of Web usage. Journal of Advertising REsearch, 39(2).

- Kyle, G. (2000). Towards an understanding of leisure involvement. Abstracts for the 2000 leisure research symposium: Issues and challenges in leisure services and scholarship .
- Laczniak, R. N., Muehling, D. D., & Grossbart, S. (1989). Manipulating message involvement in advertising research. Journal of Advertising, 18(2), 28-38.
- Laurent, G., & Kapferer, J.-N. (1985). Measuring consumer involvement profiles. Journal of Marketing Research, 22, 41-53.
- Lawless, K. A., & Kulikowich, J. M. (1998). Domain knowledge, interest, and hypertext navigation: a study of individual differences. Journal of Educational Multimedia and Hypermedia, 7(1), 51-69.
- Levy, D. M. (1997). I read the news today, oh boy: Reading and attention in digital libraries. Proceedings of the 2nd ACM international conference on Digital libraries (pp. 202-211).
- Lynch, P., & Horton, S. (1997) Yale C/AIM Web style guide [Web Page]. URL <http://info.med.yale.edu/caim/manual/contents.html>.
- Maheswaran, D., & Meyers-Levy, J. (1990). The influence of message framing and issue involvement. JMR: Journal of Marketing Research, 27(3), 361-368.
- Mills, C. B., Diehl, V. A., Birkmire, D. P., & Mou, L.-C. (1995). Reading procedural texts; effects of purpose for reading and predictions of reading comprehension models. Discourse Processes, 20, 79-107.

- Mittal, B. (1989). Measuring purchase-decision involvement. Psychology & Marketing, 6(2), 147-162.
- Morkes, J., & Nielsen, J. (1997) How to Write for the Web (Full Paper) [Web Page].
URL <http://www.useit.com/papers/webwriting/writing.html>.
- Nielsen, J. (1997) How users read on the Web [Web Page]. URL
<http://useit.com/alertbox/9710a.html>.
- Nielsen, J. (1989). The matters that really matter for hypertext usability. Proceedings of the ACM conference on Hypertext: Hypertext '89 New York: ACM Press.
- Nua [Web Page]. URL http://www.nua.ie/surveys/how_many_online/ [2001].
- O'Connor, B. C. (1993). Browsing a framework for seeking functional information.
Knowledge: Creation, Diffusion, Utilization, 15(2), 211-232.
- O'Hara, K. (1996). Towards a Typology of Reading Goals. (Technical Report EPC-1996-107).
- O'Hara, K., & Sellen, A. (1997). A comparison of reading paper and on-line documents.
Proceedings of CHI '97 (pp. 335-342). New York: ACM Press.
- Raman, N. V., & Leckenby, J. D. (1998). Factors affecting consumers' "Webad" visits.
European Journal of Marketing, 32(7/8), 737-748.
- Redish, J. C. (1998). Reading to learn to do. The Technical Writing Teacher, 15(3), 223-233.

- Rouet, J.-F., Levonen, J. J., Dillon, A., & Spiro, R. J. (1996). An introduction to hypertext and cognition. J.-F. Rouet, European Association for Research on Learning and Instruction, & Conference Hypertext and cognition (pp. 3-8). Mahwah, N.J: Lawrence Erlbaum.
- Russell, S. J., & Norvig, P. (1995). Artificial intelligence: a modern approach. Upper Saddle River, New Jersey: Prentice-Hall, Inc.
- Schiefele, U. (1999). Interest and learning from text. Scientific Studies of Reading, 3(3), 257-279.
- Schiefele, U., & Krapp, A. (1996). Topic interest and free recall of expository text. Learning & Individual Differences, 8(2), 141-161.
- Slama, M. E., & Tashchian, A. (1985). Selected socioeconomic and demographic characteristics associated with purchasing involvement. Journal of Marketing, 49, 72-82.
- Slatin, J. M. (1990). Reading Hypertext: Order and Coherence in a New Medium. College English, 52(8), 870-883.
- Snyder, I. (1997). Hypertext the electronic labyrinth. New York, N.Y: New York University Press.
- Spool, J. M. (1999). Web site usability a designer's guide (Morgan Kaufmann series in interactive technologies). San Francisco: Morgan Kaufmann Publishers.

Spyridakis, J. H. (2000). Guidelines for authoring comprehensible Web pages and evaluating their success. Technical Communication, 47(3), 359-383.

Techniques for Web Content Accessibility Guidelines [Web Page]. URL

<http://www.w3.org/TR/1999/WAI-WEBCONTENT-19990324/wai-pageauth-tech>
[1999].

Tuman, M. C. (1992). Literacy online the promise (and peril) of reading and writing with computers (Pittsburgh series in composition, literacy, and culture . Pittsburgh: University of Pittsburgh Press.

Wigfield, A. (1997). Reading motivation: a domain-specific approach to motivation. Educational Psychologist, 32(2), 59-68.

Wineburg, S. (1997). Beyond breadth and depth: subject matter knowledge and assessment. Theory Into Practice, 36(4), 255-261.

Wilson, T. D., & Walsh, C. (1996). Information behaviour: an inter-disciplinary perspective. A report to the British Library Research & Innovation Center on a review of the literature. British Library Research and Innovation Report 10.

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, 23(4), 50-71.

Zwaan, R. A. (1994). Effect of genre expectations on text comprehension. Journal of Experimental Psychology: Learning, Memory and Cognition, 20(4), 920-923.