The Effect of Informative, Intriguing, and Generic Hyperlink Wording on Web Browsing Behavior
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This paper presents a study of the effect of informative, intriguing, and generic hyperlink wording on Web browsing behavior. The study was administered via the Web using a modified naturally occurring informational Web site. Link wording was varied in both the navigation menu and links embedded in the text. Data about participants' browsing behavior were logged with PHP scripts, and demographics, perceptions, and comprehension were measured through a post-browsing survey. Data from the study are being analyzed and will be presented at the conference.

On the World Wide Web, two kinds of navigation behaviors predominate: searching or browsing. Depending on the situation (or perhaps on the person), some people search Web sites for particular information they want to find. At other times, people browse Web sites to learn about unfamiliar subjects, solve ill-defined problems, or simply explore topics of interest. In a hypertext document such as a Web site, navigation aids are important for both searchers and browsers, who must overcome the challenges of finding and comprehending content in an online environment. These challenges can include the inability to view or conceptualize the entire Web site at once, to remain oriented within a large Web site, and to choose which page to view next. As users search or browse Web sites, links are the main navigational signals they use to decide how to move from page to page and from site to site.

Technical communicators involved in designing Web sites are likely to wonder how the wording of links can affect their effectiveness as navigational signals. To help answer this question, we explored the effect of three versions of link wording (informative, intriguing, and informative) on the browsing behavior of people visiting informational Web sites and on their comprehension of the content of the pages they visit.

RELATED LITERATURE

In this section, we review studies that have examined the effects of (a) link informativeness; (b) text "seductiveness" (intriguingness); and (c) links embedded within Web page body text ("embedded links"). Most studies of online navigation have focused on people searching for information, either in Web sites or in closed hypertext or hierarchical database systems—few have observed people browsing Web sites. Our study focused on browsing so as to improve our general understanding of this little-researched behavior.

Link Informativeness

A review of Web site design guides shows that many recommended wording link titles so that Web site visitors can readily find content of interest. Although Borges et al. (1) promote conciseness in link wording, multiple guideline developers emphasize the need to include enough detail about the targeted content to help users form accurate expectations of where a link would take them (e.g., 2, 3, 4, 5). That is, guideline authors more often promote the use of informative, relatively detailed links as opposed to more concise links.

In fact, so important is the perceived need to provide as much information as possible about the targets of links that a variety of ways to make links even more informative, beyond using informative wording, have been proposed. Examples include displaying thumbnail graphics of target pages with enlarged key headings (6) and annotating links with small, inline red, yellow, or green "traffic light" images indicating expected download times (7). Wettemann and Lenertshotr (8) suggest displaying additional information about links displayed on Web pages, such as the status of the link (broken or working), the type of link target (e.g., Web page, PDF file, or multimedia file), the popularity of the target, the language of the target text, the time and date when the target was last updated, and the expected time to download the target.

Results from some studies support those guidelines that promote informative links. They indicate that making links more informative can help people find information that they are searching for, both on the Web and in closed hypertext and hierarchical database systems. For example, people searching for information in commercial Web sites were most successful when the Web sites included long text links followed by long descriptive abstracts (6); this finding is anecdotal. Appending either of two kinds of items to menu titles—keyword descriptors (e.g., "General Interest Guide: News, Weather, Sports, Entertainment,...") or "help fields" containing details about target content—significantly improved the accuracy of people searching hierarchical databases (9, 10).

However, results from some studies suggest that link informativeness by itself is not sufficient to make a link an effective navigation aid. At least two other factors can reduce or cancel out the navigational advantage of adding informative details to links: unclear wording and extensive link length. When link wording is unclear,
navigation performance suffers. Clarity can be improved by using the users’ own terms: renaming menu items with names suggested by study participants increased the accuracy of hierarchical database searches by 40% (9). Clarity also can be improved by avoiding ambiguous terms. While college students’ accuracy at sorting items into categories increased by 6% when examples were included with category names, removing “Miscellaneous” from the selection of categories improved accuracy 45% (11).

A second way to reduce or cancel out the effect of link informativeness was revealed by a study that suggested that it is possible to add so much explanatory detail to links that users’ navigation performance is not improved: including explanatory annotations with links did not improve either accuracy or efficiency of high school students’ information searches (12). In this study, link titles were especially detailed (e.g., “The Adolescent, Their Family, and Anorexia”) and annotations particularly lengthy (on the order of short paragraphs).

While nearly all studies have focused on people searching for information in Web sites, hypertexts, or databases, two studies have included a browsing task. In one study, the inclusion of links offering clues to the kind of content in target pages (“content links”) did not improve participants’ performance on a recognition posttest (13). In this study, content link labels included very short annotations such as “summary” or “definition,” which may have been too abstract to be informative. Another study examined the effect of semantic and organizational concreteness of local navigational links on user comprehension and perceptions of use (14, 15, 16). This study, which asked users to browse an informational Web site on arthritis, revealed that comprehension was slightly improved when navigational links provided both semantic and organizational cues about the target text (e.g., “Section 3 of 9: Causes”) and that comprehension was degraded when links provided only structural cues (e.g., “Section 3 of 6”).

**Text Seductiveness**

Little research has been conducted on intriguing links. The field of research that is most closely related concerns the study of seductive details in reading comprehension. Seductive details have been shown to divert readers from the main point of a passage (17, 18). Readers focus on a seductive detail and remember it, sometimes at the expense of the target point of a text. They may also misinterpret the text under the influence of the seductive details.

Baylor (19) studied disorientation and incidental learning in a Web site. One of her measures was the presence of distracters, which in this experiment were links to seductive sites that were off topic, such as David Letterman’s Top Ten lists. She found that incidental learning, as measured by the ability to explain the main topic of the passage and to generate examples pertaining to the passage, was negatively affected by the presence of distracters.

These studies do not extensively operationalize what a seductive detail is. A general definition is something that is very interesting, but unimportant to the main purpose of the text. Candidate topics for seductive details include sex, sensational death (struck by lightning), intrigue, and popular culture items.

**Embedded Links**

Some commentators have speculated that embedded links (a) might hinder or distract readers by breaking up the “flow” of text and making it too easy to move to another page, and (b) might be easier for users searching for information on Web pages. Indeed, in one study of people searching commercial Web sites, researchers observed that participants seemed less likely to complete their searches successfully if access to the information sought was by embedded links [4]; this finding was anecdotal. In contrast, in three studies of people searching closed hypertext systems for information, participants who used embedded links rather than links arranged as lists in menus bars completed their searches more quickly. In one study, college students searching a hypertext to answer questions and solve problems viewed significantly fewer pages, answered more questions correctly, and solved problems faster when the version of the hypertext included embedded links rather than a link menu (20). In another study, participants searching a Web site containing only embedded links completed information searches faster than participants searching a Web site in which links were listed horizontally only at the bottom of each Web page (21).

**Summary of the Literature and Hypotheses for the Current Study**

On balance, the results of past studies reveal that making links more informative by adding descriptive detail about the target content (either as part of the link title or as a link annotation) can improve users’ ability to navigate within a Web site and their comprehension of the site’s content, as long as the links are worded clearly and precisely, and unnecessary detail is excluded. Past studies also suggest that making links more intriguing through seductive wording can encourage browsers to explore more widely within a Web site but may interfere with learning. Finally, while past research suggests that embedded links may improve users’ search performance, it has not shown how browsing is affected.

The review of the literature led to the following hypotheses: (a) participants browsing Web sites will visit more pages when links are more intriguing, and (b)
participants will learn more when links are more informative.

METHOD

Study Overview

To test our hypotheses, we asked study participants to browse different versions of a test Web site and then complete online demographic and comprehension questionnaires. Data concerning participants' navigational behavior were automatically recorded.

Participants

Participants included more than 400 undergraduate engineering students, enrolled in technical communication courses during fall 2003 and winter 2004.

Materials

The study Web site consisted of a copy of a U.S. National Park Service Web site on the natural history of American Samoa. To adapt the site for use in this study, we reduced the number of pages to 19 and added four to six embedded links per page.

Both the navigation menu links and embedded links were re-worked to conform to three separate conditions: generic, intriguing, or informative. The generic links were relatively short (one to two words in length) and were usually unmodified nouns. They often were taken directly from the original Web site. Intriguing links were two to four words long, with titles that were either seductive, provocative, or otherwise attention-getting. Informative links were two to four words long and were relatively explicit and detailed. Specific criteria were agreed on by the researchers in order to operationalize the three link types. A specific example of three versions of the same link follows: the generic link is to a page on wildlife food sources was entitled "Atmeal Foods;" the intriguing link was "Nature's Picnic Basket;" and the informative link was "Wildlife Food Sources;".

Five versions of the Web site were then generated using PHP scripts. Each version incorporated one link condition in the left-hand navigation menu and one link condition in the links embedded in the content text. The five link conditions (navigational menu vs. embedded links) were (a) generic-generic, (b) generic-intriguing, (c) generic-informative, (d) intriguing-intriguing, and (e) informative-informative. The order of the navigation bar links was also randomized within all conditions.

Two other components were added to the study Web site: An introductory section provided background information about the study and an informed consent statement, and instructed participants to browse the Web site for about 15 minutes while imagining themselves to be new Park Service rangers trying to learn about American Samoa in order to answer visitors' questions. An online questionnaire tested participants' factual and inferential comprehension of the Web site content once they had completed their browsing task, and assessed their impressions of the Web site.

Procedure

All participants received printed flyers about the study from their technical communication instructors. Participants went to the URL listed on the flyer and completed the study task at times convenient for them, using remote Internet connections. When each participant opened the initial page of the test Web site, one of the five versions of the site was randomly displayed. Each participant read the introductory section and then browsed the test Web site. Information such as the location of each link clicked by a given participant and the time spent on each page was recorded in a text file through PHP scripts. When participants finished browsing, they clicked a "Continue to the survey" button and completed the online survey and comprehension test (without looking back at the Web site). Standard Apache Web serve log files were also collected.

RESULTS AND DISCUSSION

Data from the study are being analyzed in SPSS 11.5 and will be presented at the conference. Pilot study results suggest that users are guided by order of links in the navigation bar. Initial results from the full study suggest that users visit more pages in the intriguing link condition. Initial results also indicate differences between conditions on inferential comprehension. Implications and recommendations for technical communicators will be discussed at the conference.

REFERENCES


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