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The World Wide Web and Decision Support: Perceptions and the Confirmation Bias

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Introduction

The recent proliferation of World Wide Web (WWW) sites has attracted attention in the media so that the general public awareness of these resources has greatly increased in recent months. In many subject areas, particularly those relating to computing and the Internet, the most current publicly available information is on the WWW. The scope of this information is rapidly expanding in other subject areas as well. In addition to using the WWW for entertainment purposes, many decision makers may access it to obtain relevant information. At the same time, a number of organizations are constructing intranets, secure islands within organizations where internal information is presented in the same manner as on the WWW (Kay, 1996). As the number of people with Internet and intranet access is continuing to grow very rapidly and greater numbers of people use the information resources on the WWW all the time, possible influences on these users' decision-making behavior should be examined.

The research investigates the effects of the confirmation bias on decision makers who access the WWW to gather information relevant to their decision tasks. Often decision makers come to a task with initial inclinations as to a best answer. Those predisposed toward a particular solution often exhibit a preference for searching for confirming information over falsifying information (Wason and Johnson-Laird, 1972). The arrangement of information on the WWW and the manner of accessing that information through hypermedia links may exacerbate the effects of the confirmation bias on decision makers employing this resource or may also provide opportunities to ameliorate these effects. In particular, with the increase in electronic commerce taking place on the WWW, investigating the effects of the confirmation bias has implications for organizations constructing Web sites aimed at consumers.

Motivation

The confirmation bias is one that may particularly affect decision makers employing the WWW to retrieve relevant information. Mynatt, et al. (1977) identify the confirmation bias as the tendency for people to search for information that confirms their initial hypotheses and fail to examine alternative hypotheses that also are consistent with the available information. Similarly, Kydd and Aucoin-Drew (1983) describe a "selective perception" bias that describes decision makers' inclinations to search out confirming information and to remember this information. A decision maker may form a hypothesis and then gather and interpret information so that the hypothesis is supported (Skov and Sherman, 1986). In addition to selective information retrieval, people may be subject to the confirmation bias due to failure to use disconfirming information they do encounter (Mynatt, et al., 1978).

The ability of WWW users to follow links that look interesting or promising may exacerbate the effects of the confirmation bias. With traditional text-based systems, decision makers may not be able to find confirming information and ignore disconfirming information easily. WWW features that enable users to switch quickly to other documents may allow them to find the desired confirming information while avoiding disconfirming information with less effort.

Propositions and the General Model

The current research addresses the question "How does the confirmation bias influence decision makers using the WWW to retrieve information relevant to the decision task?" From this question stem the following propositions:

- Decision makers' initial inclinations as to the best solution will influence their information retrieval activities, their perceptions of those activities, and their final decisions.
- Decision makers' information retrieval activities will influence their perceptions of those activities.
- Decision makers' perceptions of their information retrieval activities will influence their final decisions.

The general model under consideration in the current research is presented in Figure 1. The propositions correspond to the links detailed in the figure. Note the absence of a direct link between the decision makers' information retrieval activities and the final decisions. Rather than making choices based on actual evidence examined during the search process, decision makers base their decisions on their predispositions and their, possibly inaccurate, perceptions of what they see.

We propose to examine these propositions through the use of a laboratory experiment. Subjects will be given a decision task and asked to use a web site especially constructed for this study to retrieve information relevant to the task. The task is a classical managerial decision that may be made using information accessible on the WWW. Subjects will be asked to choose between alternative courses of action.

The methodology is similar to that employed by Ward (1991). Subjects will be assigned to one of three groups designed to bias them toward a particular course of action. Their initial inclinations regarding the best choice will be recorded. The actual information they access will be noted. Their perceptions regarding the information they access will be measured. Finally, subjects will be asked for their selections.

Current Status

The WWW site presents the decision task and instructions to the users, provides information relevant to the task, queries users concerning their initial inclinations, tracks which information users access, and administers a post-test questionnaire at the completion of the session. Pilot testing is currently under way. After making any adjustments in the site, the task, or the instruments indicated by the results of the pilot test, initial data collection will commence. As the study should take no more than an hour or two for each subject, initial results will be available soon after the start of data collection.

Contributions and Future Directions

This research extends the work on the effects of cognitive biases on users of model-based and simple text-based DSS to examine possible similar effects on decision makers retrieving information in the hypermedia environment of the WWW. The radical differences in these new media may exacerbate the effects of these biases or may provide opportunities for ameliorating these effects. Once the effects of the confirmation bias have been determined, some attempts at decreasing the effects of these biases may be made.

The results should have implications for decision makers using the WWW to retrieve information to aid in their decision tasks. More importantly, the results may convince WWW content providers of the necessity of following some guidelines regarding the presentation of information so that particularly important information is seen and noticed.

Several possible avenues for future research exist. The effects of similar biases such as anchoring-and-adjustment (Plous, 1993; Remus and Kottemann, 1995) and illusion of control (Langer, 1975; Kottemann,

et al., 1994) on WWW users should be investigated. Methods of ameliorating biases while using the WWW such as highlighting disconfirming information may be explored. Opportunities abound for applying the body of research on cognitive biases in decision making to this popular new media.

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