The Influence of Web Browsing Experience on Web-Viewing Behavior

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1 Introduction

The World Wide Web has become an important source of information, as much as traditional media like books, newspapers, and television. While there have been many studies on Web searching, research into Web-viewing behavior using eye-tracking systems has only recently begun [Pan et al., 2004]. Josephson and Holmes [2002] studied Web-viewing behavior focusing on the category of Web page visual design. They suggested that eye movements were affected by the following two factors: (1) visual design of Web pages and (2) habitually preferred path across the visual stimuli. However, these previous studies did not sufficiently consider the user's experience. The purpose of this study is to investigate how past Web-browsing experience influences Web-viewing behavior. We used a detailed questionnaire to measure a user's Web-browsing experience and analyzed the eye-tracking data based on the user's prior Web experience.

2 Method

Four Internet users were recruited based on their Internet usage. While they all used the Internet every day in their work, they differed in terms of Web-browsing style. They were divided into two groups, A and B, based on their Internet usage styles. Group A consisted of comparatively heavy Internet users who browse and use various portal sites. Group B consisted of comparatively conservative users who use a regular portal site for fixed purposes. The experiment consisted of two phases, observation and recognition. In the observation phase, participants focused on evaluation tasks. They were instructed to look at the Web pages carefully and evaluate the usability of those pages. Participants viewed 15 Web pages in three categories: Portal, News, and Advertisement. After the observation phase, participants filled out an Internet-usage questionnaire. In the recognition phase, participants were asked to observe 30 Web pages including the previous 15 pages and to determine if they had seen these pages in the previous phase. Eye movement data were collected using an eye-tracking system (Tobii Technology) during the experiment. Each Web page was presented for 20 seconds during the observation phase, and for 5 seconds in the recognition phase.

3 Results

The contents area of each web page was classified into six functions based on Nielsen & Tahir [2002]. Table 1 presents the mean percentage of gaze frequency in each condition. A framed rectangle indicates the highest score within the specific condition. The results indicated distinctive differences in Web-viewing

behavior between user groups. At the Portal page, Group A exhibited consistent viewing behavior between the observation and recognition phases. In contrast, Group B exhibited inconsistent viewing behavior. At the News page, both groups demonstrated consistent viewing behavior between observation and recognition phases. At the Advertisement page, both groups exhibited an instable viewing-behavior pattern because they seldom browse advertisement pages. These results suggest that prior Web-browsing experiences form an individual's efficient tracking method or mental model of how to view a Web site to get information.

Table 1: Mean percentage of the gaze frequency in each condition

Web categories	Function	Group A		Group B	
		Observation	Recognition	Observation	Recognition
Portal	W	6.1	9.9	13.6	26.2
	N	40.2	30.5	29.0	14.9
	C	29.5	27.0	20.1	20.6
	A	18.5	26.2	27.4	30.5
	S	5.7	6.4	10.0	7.8
	F	0.0	0.0	0.0	0.0
News	W	3.7	9.2	9.4	13.2
	N	15.5	10.6	18.0	9.1
	C	68.8	62.4	50.9	47.9
	A	11.5	17.7	18.2	28.1
	S	0.5	0.0	3.6	1.7
	F	0.0	0.0	0.0	0.0
Advertise-ment	W	4.1	4.1	7.7	15.6
	N	33.4	34.0	37.5	30.3
	C	24.7	23.7	24.9	11.5
	A	1.4	0.0	1.8	0.8
	S	32.6	34.0	24.7	31.1
	F	3.8	4.1	3.2	10.7

Note. The symbols in the function column stand for six functions based on Nielsen & Tahir [2002]: Welcome and site identity, Navigation, Content of interest, Advertising and sponsorship, Self-promotion, and Filler, respectively.

References

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