Towards Understanding Consumers' Quality Evaluation of Online Health Information: A Case Study

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ABSTRACT

We present a case study of quality evaluation of online health information. Two participants were selected from a health information search (HIS) study, in which we are investigating consumers' evaluation of the quality of online health information. The selected cases offered a rare example of two almost exactly opposite eye-movement patterns on the same webpage. To better understand the differences in these patterns, we investigated participants' cognitive evaluation processes by examining their textual explanations collected in post-task questionnaires and verbal explanations collected in the retrospective think-aloud (RTA) sessions. We discuss how eHealth literacy and personality scores may be related to the behavioral differences. The findings of this case study inform the formulation of hypotheses for full data analysis of the HIS study, as well as future research addressing behavior patterns and factors affecting consumers' quality evaluation of online health information.

KEYWORDS

eye-movement, quality evaluation, health information, eHealth literacy, personality

INTRODUCTION

The internet has become the most used, and often the first, go-to information source for ordinary health consumers (Marrie et al., 2013). The quality of online health information presents as a major concern for all stakeholders involved in the online health information ecosystem. Evaluating information quality remains to a major challenge for consumers (Feufel & Stahl, 2012). Much research has been done to examine this topic. It was found that individual factors, such as age, education levels and health literacy, influence health information evaluation behavior (Lam & Lam, 2012; Liao & Fu, 2014). However, little is known about how consumers evaluate online health information quality and what exactly the challenges are.

In the online environment, hundreds of interface and content elements (e.g., author, dates and copyright) could serve as quality indicators (Zhang, Sun & Xie, 2015). To enhance the current understanding of consumers' quality evaluation behavior, we adopted a mixed method approach, using eye-tracking and retrospective interviews to examine what interface elements are being used for quality evaluation and whether individual differences, primarily eHealth literacy and personality, influence the behavior.

METHODS

We recruited 12 participants (we plan to recruit 48 in total). The study was conducted in a lab with a PC and an eye-tracking device. Participants first filled out demographic, personality and e-health literacy questionnaires. They then performed a practice task to ensure that everyone understands the study process. Then, each participant was presented with five predefined health information search tasks (orders were randomized). For each task, we preselected three webpages. Participants were asked to examine the three pages and determine whether they would recommend the pages to their family or friends. A retrospective think-aloud (RTA) session was performed after the completion of all the five tasks.

In this paper, we present data from two participants, because of their drastically different eye-movement patterns on one webpage. They were scanning and reading the page for the following scenario:

> *Imagine that one of your friends is struggling with whether to have her teenage son receive an influenza vaccine. So you conducted an online search, these three webpages are among the pages that show up in the search results. After browsing each page, you will determine whether you want to share this page to your friend.*

RESULTS

The gaze plots of the two participants show almost exactly opposite (i.e., not overlapping) eye-movement patterns (Figure 1). Gaze plots display the position, order and (roughly) time spent fixating at locations on a stimulus. P1's gaze plots roughly resemble an *F*, which corresponds to the F-shaped pattern in viewing text-based web content (Nielsen, 2006), and most of the fixations are on the main content area, where their sequence indicates focused reading of topical information (Gwizdka, 2014). By contrast, P2's gaze plots show an atypical pattern with fixations scattered at the top, right side and bottom areas, and only a few of them located in the main content area.
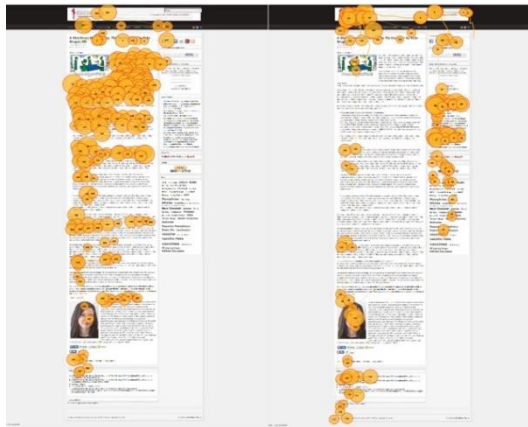

Figure 1. Gaze plots of P1 (left) and P2 (right)

Task performance of the two participants (including choice made on this page, time on task, time on page, count of links clicked on) and their background information (including eHEALS and TIPI scores) are shown in Table 1. P1's eHEALS score is substantially lower than P2. P1 spent significantly longer time (both time on task and time on page) than P2.

		P1	P2
Choice (share or not)		No	No
Time on Task		176s	41s
Time on Page		85s	38s
Click on links		To homepage	N/A
eHEALS Score		21	36
TIPI	**Extraversion**	1.0	5.5
	Agreeableness	4.0	6.5
	Conscientiousness	2.5	7.0
	Emotional Stability	4.5	3.5
	Openness to Experiences	6.0	7.0

Table 1. Task performances, eHEALS and TIPI scores

Table 2 shows examples of web elements mentioned by the two participants in the RTA interviews and their short comment on these elements.

SUMMARY

The differences in eye-movement patterns can be attributed to many factors, such as one's demographic factors, familiarity with and interest in the task topic, as well as health literacy. Nevertheless, the preliminary observations based on currently collected data allow us to formulate working hypotheses. Here are a few plausible examples:

	Page Element	Comment
P1	A cartoon	Not serious
	Social media widget	Not relevant
P2	Title and logo image	Don't know what it is
	Layout and design	Doubting a lot
	Related posts	Very fear based
	Donate sign	A big no

Table 2. Example of phrases from RTA interviews

Compared with higher eHealth literacy, people with lower eHealth literacy tend to:

H1a: spend more time on quality evaluation;

H1b: rely more on relevance than on quality indicators.

In evaluating health-related webpage quality:

H2a: People with lower eHealth literacy tend to rely more on the main content of a webpage than on quality indicators;

H2b: People with higher eHealth literacy are able to take advantage of quality indicators.

We will begin testing these hypotheses after collecting data from more participants.

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