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ANALYSIS OF USER BROWSING BEHAVIOR ON A HEALTH DISCUSSION FORUM USING AN EYE TRACKER

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Abstract

This is a small study of browsing behaviour in a health discussion forum (HealthBoards.com) for three types of users—users searching for own health issue, for a friend's or relative's health issue, and with no particular issue in mind. It used an eye-tracker machine to measure durations of quick eye movements (interpreted as skimming) and eye-fixation (interpreted as examining). Users' eye movement behaviour was analyzed for the summary result screen displaying post surrogates, and the detailed post screen. The duration of skimming and duration of examining for the two types of screens were analyzed, and the differences for relevant and non-relevant posts and for the three types of users were identified.

Users searching for own health issue spent substantially more time scanning post surrogates and reading post content than the other types of users. They also had the longest duration of examining (eye-fixation). For posts that were judged non-relevant, users searching for own issue spent much less time reading them, but more of the reading time was devoted to skimming than examining. Users with no particular issue spent more time skimming post surrogates and post content, than examining them in detail. In conclusion, he three types of users make use of different relevance criteria, reflected in their browsing patterns. Users searching for self usually make use of case-based relevance criteria, users searching for others seek factual knowledge, and users with no particular issue make use of their general knowledge and personal criteria to decide interestingness.

Keywords: health information; everyday life; social media; browsing

Introduction

This is a study of user browsing behaviour on a health discussion forum. Previous studies of online searching behaviour have focused on search query formulation and reformulation in information retrieval systems, and on relevance judgement of the document surrogates (records) retrieved by the search queries (Barry, 1994, 1998; Schamber, Eisenburg, & Nilan, 1990; Schamber, 1994; Tombros, Ruthven, & Jose, 2003). Browsing of the document surrogates was often treated off-handedly as a simple activity that doesn't require more detailed analysis. Even less studied is the browsing of fulltext documents (Zhang, 2012; Balasoukas & Ruthven, 2012). This is not surprising as query formulation and reformulation in information retrieval systems are difficult tasks that require various kinds of knowledge and skills, and have a substantial impact on the quality of the search results.

However, the rise of Web search engines employing fuzzy matching approaches and network analysis has downplayed the importance of query formulation—users are expected only to enter a few keywords. The hyperlinked nature of the World Wide Web has emphasized browsing of Web pages and navigation by selecting hyperlinked terms. The proliferation of various social media applications and the explosion of user-contributed content on social media platforms have placed further emphasis on user browsing and

navigation for everyday life information. There is a need for more in-depth studies of browsing and navigation behaviour, and decision making during browsing (including relevance judgement).

We report a small study of user browsing in a discussion forum focusing on health issues—HealthBoards.com (http://www.healthboards.com/boards/index.php). Discussion forums are also called message boards, where people conduct communication online via posted messages. The conversation is carried out asynchronously, with user's messages recorded or archived by the forum. A registered user can post public messages and reply to other users' postings, but a guest can usually only view the postings. As with other discussion forums, HealthBoards.com has a tree-like (hierarchical) structure: a forum can have several sub-forums, which can also include several sections.

The structure of a discussion forum bears some similarity to information retrieval systems. The user can select a topic by entering a query keyword in a search box or by browsing a classification directory of topics and subtopics. Having selected a topic, the system displays a summary result screen displaying a list of post surrogates (usually the post header, including the title, author, and how many views and replies). The user has to scan the post surrogates (titles) to select posts that are likely to contain relevant information. When a post surrogate is clicked on, the system displays a detailed post screen. As a post often contains response posts from other users, and responses to the responses organized in a hierarchical structure, it is sometimes called a discussion thread. In HealthBoards.com, the responses to a post are appended to the end of the post content, so a post and responses are equivalent to a full-text document in an information retrieval system. The user reads the post and its responses to determine whether each chunk of information in the content is relevant or likely to be relevant in a practical context. The user also consumes the information by learning something.

Thus, the user interaction with a discussion forum can be divided into the following stages:

1. Searching or directory browsing
2. Scanning post surrogates
3. Reading post content

This study focused not on searching and directory browsing (stage 1) but on scanning and reading (stage 2 and 3). These two stages are equivalent to the "examining and evaluating information" step in Zhang's (2012) consumer health information-seeking model in real life settings. However, we analyzed it in more detail, subdividing it into two kinds of browsing behaviour:

- Skimming quickly over the text or the items on the screen
- Examining the text or items more closely.

The purpose of both skimming and examining is to make a judgment of whether the items (post surrogates) or text (post content) are relevant or likely to be relevant.

This study used an eye tracking system to record users' eye movements on the screen. On the eye tracker recording, skimming is manifested as quick eye movements and examining is manifested as eye-fixation. Skimming refers to the quick eye movement in one direction (Cassin & Solomon, 1990). Fixation refers to static eye focus on a particular area or object for a period of time (Carpenter, 1980). An analysis is carried out of the frequency and duration of quick eye movements (skimming) and fixation (examining), and their ratios.

People searching online for health information can be divided into three types:

- People looking for health information for their own health issue;
- People looking for health information for friend's or relative's health issue;
- People who are browsing without any particular health issue in mind.

A nationwide telephone survey in 2012 by the Pew Research Center's Internet & American Life Project found that among the people who have accessed health information online in the past year, 39% were for themselves, 39% for others, and 15% for both themselves and others (Fox & Duggan, 2013). There was no category in the survey for people who were simply browsing without any health issue in mind. However, an analysis of this type of browsing can provide insights into monitoring behaviour in everyday life information behaviour (such as when reading a newspaper or magazine), and serendipitous encountering of health information.

The objective of this study is to find out whether ordinary people browsing for health information on a discussion forum exhibit different browsing patterns (in terms of the amounts of skimming and examining) depending on whether they are browsing for own, others' or no particular health issue in mind.

In post-experiment interviews, we played back to the study participants a recording of their eye movements on the screens and asked them to comment why they selected the post surrogates they did, and whether the text that they examined contained relevant information and why. We found that participants who were browsing for the own health issue made use of case-based reasoning to determine relevance to their own situation. Participants browsing for others' health issue were generally looking for factual knowledge, whereas participants with no particular health issue selected information of general interest. We attempt to explain the users' browsing patterns based on these three types of relevance criteria.

Literature Review

Many people are searching for health information on the Internet via various types of devices, such as PC, laptop and smartphone. Among the various kinds of online information sources, user-contributed health information on social media sites is an increasingly important source. A nationwide telephone survey in 2012 by the Pew Research Center's Internet & American Life Project found that 81% of adults in the U.S. used the Internet, and of these 72% had accessed health information online in the past year (Fox & Duggan, 2013). Eighteen percent of Internet users had also consulted online reviews of particular drugs or treatments. Twenty-five percent of Internet users who had no health conditions read other people's experiences online, whereas 29% of Internet users who had health conditions read other's experiences. Eleven percent of Internet users who had conditions posted questions online or shared their own experiences with others. As social media sites are becoming more and more popular, it is important to understand how people share, search and use health information on these platforms, as this can have a substantial impact on people's health and how they manage their health conditions.

Most studies of health-related social media sites have focused on the types of content found (especially information and emotional support), and the motivations for posting to the sites. In a study of an alcoholism community on a social networking site, Chuang and Yang (2012) found two types of social support in the user postings:

- informational support, including facts, advice, information referral, personal stories and opinion
- nurturant support, including esteem support, network support and emotional support.

Greene, Choudhry, Kilabuk and Shrank (2011) and Zrebiec and Jacobson (2001) focused their analysis of information on social media sites on the patients' management and perception of their disease.

A few studies have analyzed the types of drug information found on consumer drug review sites in comparison with authoritative sites. Chew and Khoo (under review) carried out a content analysis of drug information on three consumer-contributed drug review sites, compared to three authoritative drug information websites. Types of information found only on drug review sites include drug efficacy, drug

resistance experienced by long-term users, cost of drug in relation to insurance coverage, availability of generic forms, comparison with other similar drugs and with other versions of the drug, difficulty in using the drug, and advice on coping with side effects. They found that side effects reported on drug review sites were vividly described in context, with user assessment of severity based on discomfort and effect on their lives. Hughes and Cohen (2011) and Schroder, Zollner and Schaefer (2007) had also analyzed the commonly reported side effects of a small number of drugs.

We have not come across any direct study of user searching or browsing of health-related social media sites. But it is clear that users who contribute content (e.g., reviews) to social media sites must themselves be consumers of such sites and gain something from the sites. They are what is termed "prosumers" (Kotler, 1986).

There have been some studies of people's online health information searching, including how people judge information quality and relevance. Many of these studies employed questionnaire surveys, observations and interviews to collect data on user behavior to derive the relevance criteria that people used in different contexts (e.g., Schamber, 1991; Barry, 1994; Choi & Rasmussen, 2002). Questionnaire surveys and interviews rely on people's perception and memory of their own behavior. It is difficult to study people's cognitive processes with these methods, as the data collection moment is quite distant from the online searching episodes. In this study we used an eye-tracking machine to record the users' eye movements on the computer screen for a quantitative analysis. We also play back the recording and ask the user to recall the reasons for their behaviour and the decisions made.

Regarding health information seeking in everyday life information seeking, there have been few previous studies. (Gray, Klein, Noyce, Sesselberg, & Cantrill, 2005) reported that many students had used the Internet as the primary source of information and health information was perceived as very important target for them. They sought online health information in the context of their life as a combination of professional, lay, personal and interpersonal information. People's everyday life health information seeking can also be viewed as consumer health information seeking since people consume the information to use in their daily life. Chi-Lum (1999) reported that people seeking health information online wanted disease information for consultation with their physicians. The motivation for seeking health information included diagnosis and desire for treatment information, and many of them were influenced by the information found (Fox & Duggan, 2013).

Use of Eye-Tracking to Study Cognitive Behaviour

Cognitive scientists have studied how people read text and found that people's eyes exhibit different behaviors on the text materials. Eye-fixation (examining) and quick eye movement (skimming) are two kinds of eye movements occurring during text reading that are within the scope of this study. Fixation refers to static or relatively static focus of the eye on a particular small area of the object. Skimming refers to quick eye movement across the area between fixations. Rayner (1977) found that people's eye movements were affected by cognitive processes occurring at the fixation period. He found that the fixation duration and number of fixations were related to people's sentence processing. Particular types of words, such as verbs received more attention than other types of words such as subjects. It indicated that people spent more cognitive effort in processing the key part of sentences rather than others, which were revealed by eye-fixations and skimming patterns. Hayhoe and Ballard (2005) pointed out that although no studies currently can reveal the internal cognitive process clearly and directly, a study of eye movements can serve as references to the internal process. Eye movement patterns can be interpreted and explained by particular mental tasks. They found that eye-fixations were focused not on the points that were visually salient but the points that were spatial-temporally best for the related task/need. The authors demonstrated that users focused on task-related visual information rather than other information by

showing an eye tracking snap picture where a user who wanted to make a sandwich focused on the table and the food components used to make the sandwich rather than other salient things such as refrigerators and doors. The duration of fixations were computed as evidence of mental task needs.

Another type of eye movement, the saccade, can also serve as evidence for studying people's mental processes. Land and McLeod (2000) studied people's eye movement response to a bouncing ball and found that saccades were always preceded by fixations that predicted the ball's movement. Deubel and Schneider (1996) found that the capability of object recognition was tightly restricted by the saccade target positions and there was coupling between visual attention and saccade programming. Both fixation and saccade can be used to indicate how people's mental process was computed (Hayhoe & Ballard, 2005). Eye-fixation can be interpreted as indicating the information process and the saccade can be interpreted as indicating the visual search for attention/information processing.

In information research, there is a trend to investigate users' eye movements on information objects to understand people's mental processes, such as relevance judgment and quality judgment. The duration of fixation was often used as an indicator of user's mental information processing in relevance judgment. Cole, Gwizdka, Liu, Belkin, and Zhang (2013) studied the relation between people's eye movements and their knowledge status, and found that cognitive features reflected/computed by eye movements and their patterns were associated with users' knowledge level. They recruited college students and used a questionnaire to determine their domain knowledge level in a medical area and information searching area. Then the participants' eye movements (duration of fixation, number of fixation, and reading speed) in searching related topics were recorded to compute cognitive parameters, such as duration of fixation, lexical access and perceptual span. They found a high correlation with domain knowledge level. Holsanova (2004) investigated eye movement patterns to understand how people made judgements of online information. Other scholars also conducted studies on relevance judgment and quality judgment by tracking people's eye-fixations and computing their duration on online search results (Balatsoukas & Ruthven, 2012).

Research Method

The participants in the study were 14 graduate students in the School of Communication & Information at the Nanyang Technological University, Singapore, who were asked to identify a health issue to seek information on in the discussion forum. Six selected their own health issue, two selected a friend's or relative's health issue, and four could not think of any health issue. The last two participants were asked to select a health issue of a friend or relative, to make a sample four for this category of information need. The participants did not include patients with serious diseases, who may exhibit different information behavior.

The eye-tracker system used in the study was the Tobii X60 series. The device comprised a 17-inch screen with the eye tracker embedded in it. The eye-tracker used a 60-Hz sampling rate, had a 0.5 degree gaze point accuracy, and permitted free head motion. The system was calibrated for each subject before the start of the formal user session.

The HealthBoards.com discussion forum (http://www.healthboards.com/boards/index.php) was selected from ten health discussion forums retrieved by the Google search engine and found to be the best in terms of comprehensiveness and usage frequency. This study focused on the summary result screen (listing post surrogates on a health topic) and the detailed post screen (displaying the content of a main post and set of responses from other users). We refer to the browsing activity on the summary result screen as *scanning*, and on the detailed post screen as *reading*.

Figure 1 illustrates a summary result screen with a summary representation of the user's eye movements on the screen. The straight lines indicate big distance eye movements where some skimming movements are along the lines. The shaded circles indicate eye-fixation (interpreted in this study as *examining* or *attention*), with the relative sizes of the circles indicating relative duration. The quick eye movements (skimming) are not shown on the recorded screen image. They are detected by the eye tracker machine and their durations are calculated from the system. They occur around eye-fixations, which indicates that after fixating on a particular point, people skim over the nearby area quickly. Skimming of post surrogates is punctuated with attentive examination of particular surrogates. A scanning session ends when the user selects (clicks on) a post surrogate to display the detailed post screen. Thus, a user session usually contains a few scanning sessions, and each scanning session includes examination of a few post surrogates, alternating with skimming of surrogates.

We assume that two kinds of relevance judgements take place during scanning. During skimming, an unconscious kind of relevance judgement takes place based on salient keywords that attract the user's attention. This cognitive process happens quickly without conscious attention or consideration. Other researchers, such as Zhang (2012), have also assumed the cognitive process to be based on salient keywords that attract the user's attention because they are associated with the user's information need/interest or desired document. A future study can investigate how these salient keywords are related to the user's information need.

When the user's attention is drawn to a particular post surrogate, attentive examination of the post surrogate takes place to estimate the likelihood that the post content contains relevant information. This is a conscious and attentive kind of relevance judgement to assess whether the post is sufficiently likely to contain relevant information. A future study can investigate the cognitive process of making this likelihood estimation and deciding that the likelihood exceeds a threshold that makes it worthwhile to examine the post in detail.

Figure 2 illustrates a detailed post screen with a summary representation of the user's eye movements. A *reading* session covers the content (text) of one main post and a set of responses to the post. Reading behaviour is again divided into skimming of text, alternating with attentive examination of certain text segments (set of sentences or paragraphs). It is assumed that during the skimming process, salient keywords attract the user's attention, which is interpreted as a form of unconscious relevance judgement. On the hand, during attentive examination of a text segment, the user is making a conscious judgement of the whether the information conveyed by the text is relevant or likely to be relevant/useful to self or other people. We carry out separate analyses for posts that the users deemed relevant, and those that were not relevant. If a post contains both relevant and non-relevant information, it is considered to be relevant.

The raw data for the analysis were the duration of each skimming movement and each eye-fixation, which were downloaded from the eye-tracker system into a Microsoft Excel file. For each scanning session, the total duration of skimming and total duration of examining were calculated. (The total duration of examining may include a few post surrogates examined.) We also calculated the ratio of examining to skimming for each session. The average values per scanning session were calculated for each participant and averaged across participants. The durations of skimming and examining during the reading of detailed posts were analyzed in the same way, except that separate average values were determined for relevant posts and non-relevant posts.

We hypothesize that people seeking information for self will exert more effort when seeking information for self. They will also have more situational information of the disease and domain knowledge, and are likely to spend more time relating the information on the discussion forum to their situation. People seeking information for others probably have less knowledge of the disease and might spend more time in

examining and reading to learn more about the disease. People browsing without a particular disease in mind is like a wildcard: their browsing behavior may vary widely depending on their personal interests and the available information on the forum.

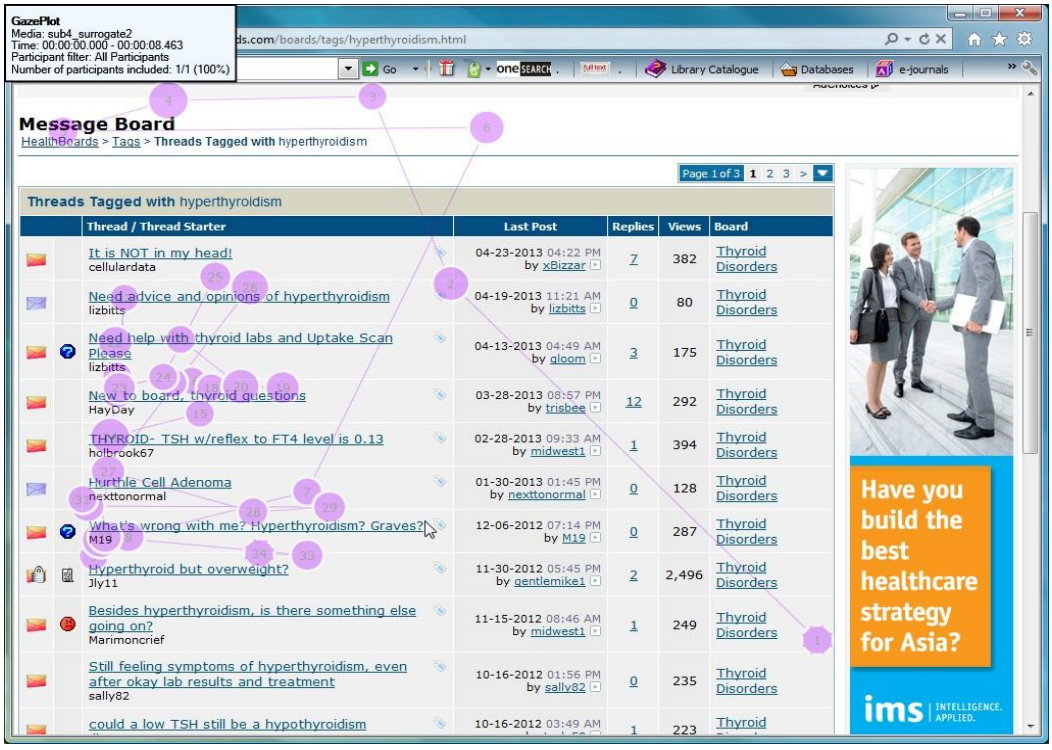

Figure 1. Example summary result screen with listing of post surrogates and a summary representation of a user's eye movements

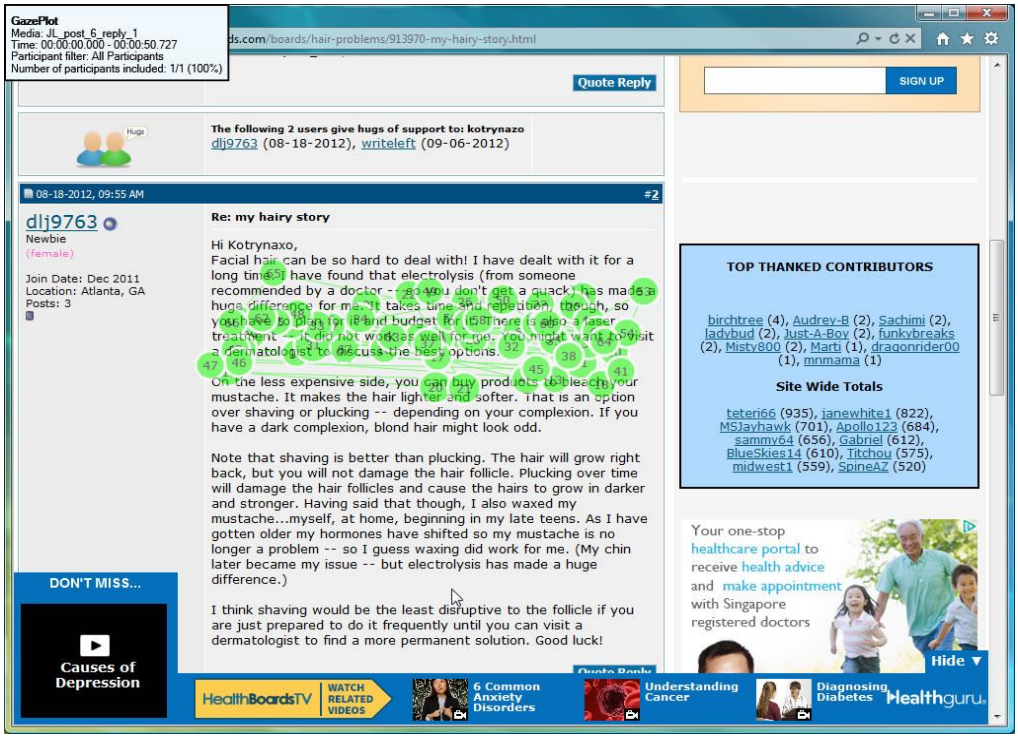

Figure 2. Example detailed post screen with post content and responses, and a summary representation of a user's eye movements

We thus propose the following hypotheses:

- H1: for both scanning and reading, people seeking information for self will spend the longest time in skimming and examining, followed by people seeking information for others, and people browsing with no particular issue in mind.
- H2: the ratio of examining to skimming will be higher for people seeking for self (i.e. they will spend more time in attentive examination), followed by people searching for others. People with no particular issue will have the lowest ratio as they will spend more time skimming to find interesting topics.
- H3: comparing reading of relevant and non-relevant posts, the ratio of examining to skimming will be higher for relevant posts than non-relevant posts.

Results

Scanning stage

Table 1 shows the average number of post surrogates that the participants fixated on and the number of the surrogates they selected to read in detail. Participants seeking for their own health issue and participants seeking for other's issue fixated on about the same number of post surrogates on average (38 and 40). However, participants browsing with no issue in mind only fixated on 23 surrogates. Participants seeking for their own issue also had the most selected surrogates (9 on average), followed by participants seeking for others and participants with no issue. The standard deviation for participants seeking for their own issue is the smallest among the three groups, which suggests that the participants in this group have fairly similar patterns of browsing behavior in the scanning stage. It was also noticed that people browsing with no issue had the highest percentage of selected surrogate, but this was because they had a small number for fixated surrogates to select from.

Table 1

Average Number of Post Surrogates with Fixations and Proportion Selected

	Average no. per participant		
	For own issue (N=6)	**For others' issue (N=4)**	**No particular issue (N=4)**
Post surrogates with fixations	38 (SD=3.88)	40 (SD=6.85)	23 (SD=6.60)
Post surrogates selected	9	7.5	6.5
Percentage selected	24.8%	19.4%	28.6%

The 14 participants had between six and nine scanning sessions. In each scanning session, the participants seeking for their own health issue examined 6 post surrogates on average; those seeking for other's health issue examined 6.7 post surrogates. In comparison, the participants browsing with no issue examined 7.6 post surrogates on average per scanning session (i.e. they scanned more post surrogates before clicking on one). Figure 3 summarizes the average duration of skimming and examining for the three groups of participants. The average number of selected surrogates is sometimes higher than the number of scanning sessions because participants sometimes continued to select the next post without first examining the surrogates.

As expected, participants searching for own issue exerted more effort and had substantially longer scanning sessions than participants searching for others or with no issue in mind. Each scanning session is

about 19 seconds on average for participants searching for own issue, and 11 to 12 seconds for the other two types of participants.

Focusing on the examining stage within the scanning sessions, we found that participants searching for own issue had the longest duration of examining, followed by participants searching for others and participants with no issue. Participants with no issue spent more time skimming for interesting topics than examining post surrogates. What is interesting is that participants searching for self spent the same amount of time skimming as examining, whereas participants searching for others spent more time examining than skimming.

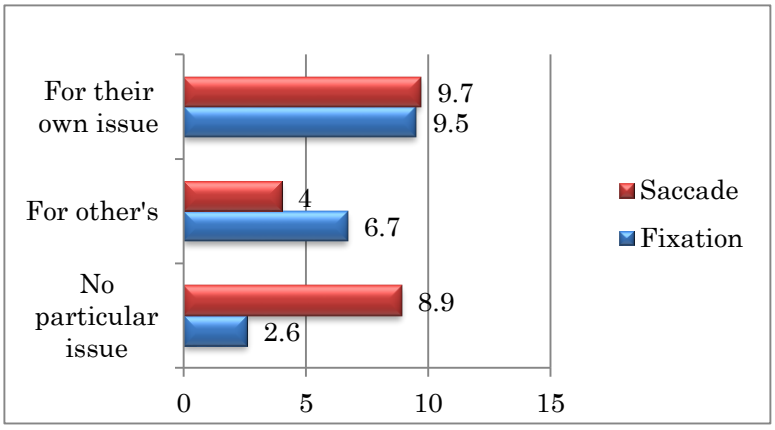

Figure 3. Summary results for scanning: average duration (in seconds) of examining and skimming per scanning session

Reading stage

The participants seeking for own health issue read an average of 7 relevant detailed posts, and 1.7 non-relevant detailed posts. Those seeking for other's health issue read an average of 4 relevant detailed posts and 4 non-relevant detailed posts. In comparison, participants browsing with no issue read an average of 6 relevant posts and 17 non-relevant posts. Figure 4 gives the average duration of skimming and examining when reading a relevant post, and Figure 5 gives the same information for reading non-relevant posts.

Focusing on the relevant posts, we found that participants searching for own issue again exerted more effort and their reading sessions (about 90 seconds) were about three times more than the duration for the other two types of participants (about 30 seconds). The results were similar to the results for scanning: participants searching for own issue had the longest duration of examining, followed by participants searching for others and participants with no issue. Participants with no issue spent more time skimming the text than examining. Participants searching for own issue and for others spent more time examining the text than skimming. This may suggest that participants searching for their own issue and others can quickly locate the interesting texts (less skimming) and read them closely to make the judgment on whether they are useful. In contrast, participants with no issue may need more time to locate the interesting texts since they did not carry on particular topics in their minds at the start of their searching process. In addition, they may not read some particular texts closely because they did not know what to focus.

For non-relevant posts, the results for participants searching for own issue were as expected. Their reading duration (about 30 seconds) was about a third of the duration for relevant posts. They also spent relatively

longer time skimming than examining. For participants searching for others, their duration was also a third of the duration for relevant documents. They were quick to decide non-relevance (in about seven seconds!).

The reading behaviour of participants with no issue is interesting. As they don't have a particular topic in mind, the cognitive process for judging relevance (or more accurately *interestingness* or *usefulness*) would be quite different from the other two types of information seeking. There is no difference in reading duration for relevant and non-relevant documents (32 seconds). The ratios of examining to skimming were also not noticeably different. This may suggest that they treated the relevant and non-relevant posts in the similar way based on their general interest. This is different with the participants seeking for their own and others who may spend more time examining the relevant posts than the non-relevant posts. Hence, the ratio of examining to skimming was observed much higher than that for participants with no issue.

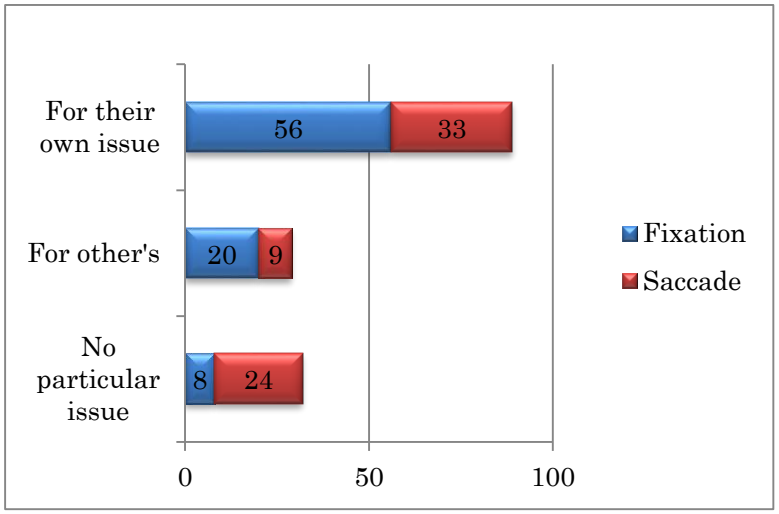

Figure 4. Summary results for reading relevant posts: average duration (in seconds) of examining and skimming per reading session

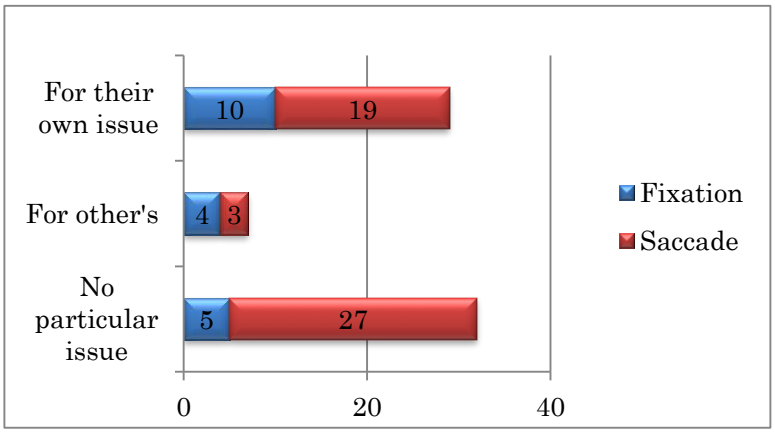

Figure 5. Summary results for reading non-relevant posts: average duration (in seconds) of examining and skimming per reading session

Discussion

The differences in browsing behaviour among the three types of users can be explained partially by:

- How much effort they are willing to expand on the searching/browsing task. Users searching for their own information need are willing to expand much more time and effort in scanning document surrogates and reading their content.
- The different types of relevance criteria used by the three types of users.

Post-experiment interviews that we carried out found that participants seeking for their own health issue usually make use of case-based relevance criteria, i.e. matching the poster's attributes and disease conditions with their own. At the scanning stage, they check many details in the surrogates and match them with their own conditions, and hence require longer time skimming and examining. In post-experiment interviews, two participants said "I found the symptoms are very similar with my own case", and "that is exactly the condition I suffered".

When reading a post content, it takes a longer time to determine relevance as users can determine the overall similarity to their own condition only after assessing a number of attributes mentioned in the post. However, non-relevance can be decided more quickly when the first few attributes mentioned do not match.

Participants seeking for a friend or relative's issue make less use of case-based criteria, as they do not know many details about their friend's or relative's condition. They focus more on the factual knowledge they can obtain from the post—especially the etiology (cause or origin) of the disease and potential treatments. So they do not require much time to check details of the poster and disease condition. Participants say "I know my mom has this problem, so I want to check it", and "my friend has this issue, I want to know more about it".

Participants browsing with no particular health issue make use of their general knowledge to decide on what are topical or important issues, and their own curiosity to decide what is interesting. They may also serendipitously encounter information that is relevant to their situation. They don't need to spend much time examining surrogates. The focus is on skimming rather than knowledge acquisition. They spend nearly as much time in skimming as users searching for own information need. One participant said *I don't know what I am looking for and I just browse to see what is there*.

Conclusion

This is a small study of the relation between users' browsing pattern in a health discussion forum and their type of information need—whether their own health issue, other's health issue or with no particular need in mind. The results are largely as expected. Users searching for own health issue spent substantially more time scanning post surrogates and reading the selected post content than other types of users. Users searching for own issue also had the longest duration of examining (eye-fixation), followed by participants searching for others and participants with no issue. For posts that were judged to be non-relevant, users searching for own issue spent much less time reading them, but more of the reading time was devoted to skimming than examining. Users searching for others were particularly quick to decide non-relevance of post content. Users with no particular issue in mind spent more time skimming post surrogates and post content, than examining them in detail. Their browsing pattern was the same for relevant and non-relevant posts.

Users searching for own issue, for others and with no issue make use of different types of relevance criteria, and this is reflected in their browsing patterns. Users searching for self usually make use of case-based relevance criteria, whereas users searching for others tend to use factual knowledge criteria. Users with no particular information need in mind clearly employ a different cognitive process to decide

interestingness or usefulness. They make use of their general knowledge to decide what information is of general interest as well as their personal criteria for interestingness.

The limitations of the study are:

- Very small sample size of just 16 people
- All the participants were graduate students of between 25 and 40 years old, and were of different nationalities (Singaporeans, Chinese and Indians)
- No participant was suffering from a severe disease.

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