What do users see when health information with different levels of sensitivity is presented on Facebook?:
Preliminary findings with eye tracking techniques

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ABSTRACT
Social networking sites are popularly used for health information dissemination. However, little research has been carried out on how users view the disseminated health information. This study using eye tracking techniques investigates how users view presented information differently when health information with various levels of topic sensitivity is presented as topic sensitivity is one of important factors that impacts user’s health information behavior on social media. The findings indicate that the content of posts are viewed the most frequently, followed by source information and post information. User engagement elements are viewed depending on the quality of the conversations in the comments. This study utilizes eye tracking techniques and provides further insights into how users view information and various elements differently on Facebook.

Keywords
Social networking sites, user information behavior, health information behavior, eye tracking, health topic sensitivity.

INTRODUCTION
Social networking sites (SNSs) are used increasingly as an important health communication tool with its features for social supports, user engagement for content generation and information sharing (Chou, Hunt, Beckjord, Moser, & Hesse, 2009). Health information disseminators recognize the benefits of using SNSs for health care promotion as shown from a research finding that 60% of state public health departments are using SNS applications (Thackeray, Neiger, Smith, & Wagener, 2012).

The levels of sensitivity of health topics are considered to be an important factor that impact users’ health information seeking behavior (Bansal, Zaheldi, & Gefen, 2010; Syn & Kim, 2016). Syn and Kim (2016) found that levels of health information sensitivity impact users’ health information related activities on Facebook, as college students tend to actively engage in conversations when the health topic is less sensitive and only passively participate when the health topic is sensitive. Bansal, Zaheldi, and Gefen (2010) discussed that the levels of information sensitivity impact users’ decisions on whether to disclose their health information due to users’ fears of possible negative outcomes, to social consequences, and to poor health status.

Eye tracking techniques help researchers understand users’ behavior and their perceptions and cognition (Michailidou, Harper, & Bechhofe, 2008). The data collected through an eye tracker, such as fixation, dwell time, and scan paths, provides more precise descriptions about what users look at from the interface. In the Information Science field, eye tracking techniques are adopted for user behavior studies to understand users’ interactions such as online searching (e.g., Lorigo et al., 2008; Kim, Thomas, Sankaranaryana, Gedeon, & Yoon, 2015) and to evaluate and improve user interfaces (e.g., Rele & Duchowski, 2015).

There are few studies that investigated users’ behavior in SNS settings (Adnan, Hassan, Abdullah, & Taslim, 2013), especially that utilized eye tracking techniques (Rizvanoglu & Ozturk, 2010). A few studies examined users’ general SNS use behaviors. Adnan et al. (2013) examined users’ behavior in viewing Facebook main pages (i.e., news feed) and found that users pay attention to the postings. Piao et al. (2013) investigated users’ viewing patterns on Twitter to demonstrate how users look for specific keywords (information) in Twitter. Other studies investigated specific features of SNSs. For example, Barreto (2013) tested whether Facebook users actually look at the ads and examined the existence of banner blindness. Rizvanoglu and Ozturk (2010) compared and evaluated the profile
This study utilizes eye tracking techniques to provide further insights into how users view information and elements differently on Facebook and to understand what users see when health information with different levels of sensitivity is presented. Research questions include (1) what do users see on Facebook when health information is presented, and (2) how do users behave differently when health information with different levels of sensitivity is presented. It is expected that eye movement analysis will provide a better understanding of the impact of health topic sensitivity on users’ viewing behavior on Facebook.

**METHODS**

An experimental study is designed that utilizes eye tracker techniques in order to understand how users behave when viewing health information with different levels of sensitivity. A total of eight participants were recruited for the preliminary examination based on the criteria of being older than 18 and a Facebook user. Four topics are selected based on Google’s top searched keywords in the health category (https://www.google.com/trends). The selected topics are allergies (less sensitive topic), influenza (less sensitive topic), HIV and medicines (highly sensitive topic), and chemotherapy for cancers (highly sensitive topic). The health topics were searched on Facebook to find posts that provide information related to the topics. The four Facebook posts were presented in different Facebook page settings (Figure 1). Participants were presented with the screens of four health topics with different page settings in random order. Brief post interviews were conducted at the end of each session for in-depth understanding of participants’ viewing intentions.

Data was collected using the Tobii T120 eye tracker and data were analyzed using Tobii Studio software. For data analysis, the number of fixations on defined areas of interests (AOIs) was analyzed. The number of fixations was used as a measure of importance since a higher fixation number indicates that users viewed the area more frequently, thus it was more important to the users. Four AOIs were defined for this study including post content, post information, source information, and user engagement. Post content indicates the actual posts including text, image, and link. Post information includes information such as poster and posted date. Source information includes information about the page organizer, such as profile photo, cover photo, about section, number of likes by users, and history timeline of the page. User engagement means areas in which users’ participation is presented, such as numbers of likes, shares, and comments, and comments on the post.

**RESULTS AND DISCUSSION**

A total of eight participants were recruited (6 females and 2 males). On average, participants were 30.5 years old and had used Facebook for 9.5 years. Participants’ eye movement data for the four posts of the four selected topics from Facebook were collected. Two topics, allergies (T1) and influenza (T2), are categorized as less sensitive health topics, and the other two topics, HIV and medicines (T3) and chemotherapy for cancers (T4), are categorized as higher sensitive health topics. For this study, the counts of fixations for the four AOIs were analyzed.

The results of the counts of fixations are presented in Figure 2. As shown in Figure 2, participants viewed the post contents a great deal (over 50%) indicating that the content of the post is important for both high and low sensitive topics. This finding is consistent with what Adnan et al. (2013) found in their study on users’ behavior pertaining to the Facebook news feed. It seems that when users are viewing any information on Facebook, they focus on the content regardless of the subject. When posts discuss highly sensitive health topics, users seem to pay more attention to them than when the posted information is less sensitive; the count of fixations for the highly sensitive health topic posts were higher than for the low sensitive health topic posts (on average, 67% for highly sensitive topics and 58.5% for low sensitive topics). Moreover, users’ focus on the content information is higher when an image is included in the post.
(T1, T3, and T4). This is possible since images catch users’ attention and cause them to view them longer.

Regardless of subject sensitivity, users viewed source information and post information in a consistent manner. Source information seems to be the next most important information that users check when viewing Facebook pages (22.75%). During their post interviews, participants indicated that they tend to check source information, especially the number of likes by users and the history timeline of the page, when they do not recognize the source of the page or the posts. On the other hand, post information, that is, metadata information on the posts, was not viewed as much (6.25%).

Participants viewed user engagement information, including numbers of likes, shares, and comments, and the conversations in the comments, more when there was no image for the posts and when the discussion in the comments was meaningful (i.e., T2 and T3). T2 did not include an image, and T3 had informative conversations in the comments related to the post. Participants said in their post interviews that they viewed the comments of other users to identify the content of the shared links and because the comments provided additional information and interpretation of the content. The user comments for the other two posts were typical reactions of SNS users such as appreciation or agreement/disagreement of the post which did not catch participants’ attention.

CONCLUSION
This study investigated users’ frequency of viewing various AOIs on a Facebook page where health information with different levels of topic sensitivity is presented. It was found that the users view the posted content most of the time, regardless of the level of topic sensitivity, although when the health topic is highly sensitive, there are more fixations. The numbers of fixations for source information and post information showed no differences in topic sensitivity. However, participants seem to view source information more than post information. Users’ comments were viewed based on the content and quality of users’ conversations shared through comments.

This study presents preliminary findings of an experimental study using eye tracking techniques. Although it presents findings utilizing unique methods and extends understanding of users’ health information behavior on Facebook, due to the limitation in data collection from a small number of participants, the findings may not be able to be generalized. In addition the topics were selected based on popular online searches on health topics; however, health topics shared and sought on Facebook may differ. These limitations provide potential next steps for the study,
that is, to examine with larger sample and investigate various health topics that are shared in SNS context.

REFERENCES


