Chapter 9
Attention Versus Learning of Online Content:
Preliminary Findings from an Eye–Tracking Study

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ABSTRACT

Previous eye tracking studies have consistently associated increased eye fixations with comprehension difficulty. However, little research has probed this relationship in more complex news stories online. This exploratory within-subject experiment exposed participants (N = 20) to different text and graphic structures in health news stories. Results suggest enhanced learning, shorter viewing time, and fewer eye fixations for a linear text structure as compared to an "inverted pyramid" text commonly used in news. Graphics interacted with text, facilitating performance in the linear conditions but inhibiting them in the inverted pyramid structure. Graphics tended to also increase viewing time and eye fixations on text only and text combined with graphics for both structure conditions. Results discuss the importance of text structure in complex news and how the data are not entirely consistent with the assumption that explanatory graphics increase understanding.

INTRODUCTION

Grabbing the attention of media audiences for all types of content is based, in part, on the common assumption that the time one spends attending to content is a reliable indicator of one's interest in that content. On the web, usability experts use eye tracking methodology to guide the designs of web sites (Nielsen & Pernice, 2009); a series of eye-tracking studies focusing on journalism sites measured how readers attended to approximately 350 elements in news stories (for summaries see http://eyetrack.poynter.org). Such eye-tracking studies measure the time and the order in which users look at information and ads on a screen, but little research to date has probed the relationship of these measures with the types of news information viewed and, equally important, the amount of information learned. In contrast, in the literature on the psychology of reading, eye tracking studies have consistently shown that time spent attending to or fixating on text content is associated with comprehension difficulty (Rayner, 1998; Rayner, Chace, Slattery, & Ashby, 2006). The current study investigated how different types of online news stories impact learning, and how/whether attention to the text, as measured with eye tracking technology, corresponds to those measures of learning.

Information Online

In the overwhelming sea of available digital information, grabbing attention and communicating news stories about complex issues to users can be challenging. Audiences of all ages are now exposed to a myriad of sources for information on the nonlinear web, sources that are gradually replacing the more linear media of radio, television and newspapers. These media are considered "linear" because they provide one stream of content in which a newspaper reader, radio listener or television viewer engages with fewer choices provided by the newer nonlinear web environment of hypertext links, web pages and multimedia.

Audiences for some news aggregation sites have already exceeded the total circulation of local daily newspapers. One national survey of 3,006 adults found 57% of respondents regularly obtain news from at least one internet source, and nearly 50% of those aged 18-49 years retrieve their information online as compared to just 23% who read a newspaper (Pew Research Center, 2008). As the media environment becomes more complex, so has user behavior (Johnson, 2004). Another national survey found that during a 30 day period, nearly 60% of households reported browsing the internet for at least one minute while watching television (Nielsen, 2010). This level of engagement is not encouraging to those wishing to quickly communicate complex yet important content online, such as health news.

At the same time, audiences with little or no expertise in fields such as health seek and often rely on information online (Brodie, Flournoy, Alman, Blendon, & Rosenbaum, 2000; Cotten & Grupta, 2004). Seeking health information on the web is similar to other online activity of email, news, weather and even hobbies (Rice, 2006). Rice found that the strongest influences on seeking health information online were: gender, employment (part-time), ongoing (or diagnoses of) medical conditions, and assisting others in dealing with health issues. This suggests the need for a better understanding of how diverse audiences learn from more complex news information. This exploratory study responds as one of the first to investigate whether the assumption that one can associate attention to news with learning from news is valid.

Previous Eye-Tracking Research

Past eye tracking experiments have explored a variety of variables ranging from user behavior by recording eye fixations to determine if a smoker's "attentional bias" affected smoking-related cues that elicited cravings (Kwak, Na, Kim, Kim, & Lee, 2007) to visual responses to text and photos

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