READER'S EYE MOVEMENT TOWARD VISUAL ELEMENT OF NEWSPAPER: EYE TRAKING EXPERIMENT OF THREE KOREAN NEWSPAPERS

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Abstract: Measuring and evaluation of reader's visual attention are important process for scientific production of newspaper. Newspaper has its apparent rules and practices regarding reporting and production of news. This study tried to suggest which element affects reader's eye attention between various visual elements like graphic, photo and headline. Especially this experiment tested research questions about reading gravity whether it starts from the upper left corner of the newspaper ends at the lower right corner. 18 subjects participated in the test and different stimuli that have different visual element used. And they were forced to read first pages of Chosun, Donga and Joongang daily newspaper each in front of eye tracker machine. We found that attention of the reader starts from center picture or the larger picture then moves to headlines. After that their attentions turn to other visual elements and they selectively read news articles. In other words readers do not focus on part which does not have visual elements.

Keywords: Eye-tracking, Newspaper readership, Visual Cognition

INTRODUCTION

The aesthetical composition of print media has long been considered so-called the sixth sense area depending on editor's decisions off the cuff. This intuitive method is still used for most artistic genres of newspaper and magazine production. But industrial needs forced the composition method to be more scientific and objective. That is, visual content industry needs to know the logical principles of how layout visual elements scientifically to attract reader's attention.

This study attempted to reveal a scientific relation of visual stimuli and reader's perception limited to the visual elements of newspaper. It can be said that visual elements has a kind of visual gravity when readers meet them. The visual gravity working on reader's visual perception are important clues for understanding the visual information processing. The aim of this research is to find out how the gravity of visual elements works on the reader's eye attention, so that to propose how to compose newspaper screens using gravity effectively.

BACKGROUND

2.1 Visual gravity on newspaper

In general, gravity is regarded as physical or mathematical objects that have force and direction. As often represented graphically as arrows, visual gravity is related with the cognition of spatial forces. The concept of visual gravity is one of the most important elements in that abstract relations can be visualized such as physical processes and geometrical properties. Similalily, some cognitive linguistic researches have tried to figure out processes in the mental space using conceptual tools of geometry (Fauconnier, 1994, 1997; Lakoff & Johnson, 1980, 1999; Chilton, 2005).

Paul Chilton (2005) has also developed this research trend to propose a Discourse Space Theory (DST) which describes linguistic and discourse phenomena as the semantics of discursive space using vectors. He suggests the DST model consisting of an abstract three-dimensional space in which geometric vectors are used to represent spatial locations, movements, and semantic configurations (79-80).

In media studies, the concept of vector is adopted as aesthetic or visual vector, one of the principles for composition of screens by Herbert Zettl. He defines the visual vector as the force of direction which move our sight from one point to another which is the most powerful force working in screens(2001; 165).

Regarding screens, not only the vectors by physical movements but the vectors by implied vectors such as arrows, objects in array and sight lines of people as well. Then, the screen becomes a vector field where physical vectors, psychological vectors, and visual vectors are working together.

There are three vector types: graphic vector, index vector, and motion vector (Zettl, 2001; 165-167). Graphic vector is made of an array of dots of lines which draw viewer's attention with such a static composing elements. Index vector is formed with people pointing to a specific direction or looking at a specific object. Motion vector depends on moving objects or objects perceived as moving.

Screens are full of various visual stimuli, so the readers must face a task to draw pertinent meanings from those visual stimuli. This interaction between screens and readers are kind of psychological experience operating through visual center of the readers. In terms of this nature of visual perception, visual gravity of screens is important elements which induce reader's attention and make the screen sensible.

2.2 Eye tracking method and visual attention

As the studies on psychology or phenomenology of perception have shown, the processes of perceiving and making meaning of objects are quite subjective related with the organs of perception and nerve. The scientific knowledge on the path of human perception is always in concern both for theory and performance. Eye tracking method is effective research tool which can answer the question that how people actually view objects and draw meanings from visual stimuli with evidences of their eye movements.

Eye-track system is more used in the studies on education and human engineering such as a study on visual verification on the existence and disappearance of object(Lecuqer et al., 2004), and on the strategies in the process of text reading(Rayner & Well, 1996). In media studies, eye-tracking is usually used in the studies on the information search process of readers of newspapers, advertisements, or web pages (The Poynter Institute for Media Studies, 1991; Stanford-Poynter Project, 2000). In these studies, the focuses are usually upon the important object among various information that reader's eye movement locations, and the orders that reader's eye travels. The results of these researches are to be used in the array of information to draw reader's visual attention easily.

The idea of this study is on the importance of the relations of visual stimuli -not only visual stimuli themselves such as size or location- on the screen as represented as direction which operate as powerful force leading viewer's visual attention. The visual gravity is one of principles of screen composition, and this study attempts to show how they work by tracking the eye movements of readers.

RESEARCH METHOD

There were 18 participants, of whom 9 were male and 9 were female. They were undergraduate students of Kyungsung University in Busan. Based on literature review, eye tracking was employed for the experiment. Three major daily newspapers of Korea (Chosun, Donga, and Joongang) were used as stimuli.

A short questionnaire to ask participants'demographic information and media habits was provided before the experiment. For the how well participants could retrieve the news and an interview was followed to supplement the questionnaire.

RESULT AND CONCLUSION

4.1 Visual gravity flows

Generally, the reading gravity theory explains that it starts from the upper left corner of the newspaper ends at the lower right corner. But as portrayed in <Figure 1>, <Figure 2> and <Figure 3>, the order of reader's eye movement starts from color or picture elements then move to headline or typo elements.

Figure1. Flow of Chosun Daily

Figure2. Flow of Donga Daily

Figure3. Flow of Joongang Daily

4.2 Eye movement flow by size and position of photo

It was explored if size and position of photo can influence on audience's eye movement flows. Participants could view more of photo elements from the news when the photo located below news article not upper.

Figure4. Flow of Chosun   Figure5. Flow of Donga

Figure4. Flow of Joongang

CONCLUSION

Through measuring and evaluating audience's visual attention using eye movement tracker, we revealed that visual gravity of screen exists between objects in visual content. Especially this experiment found that there are different findings about current theories of visual gravity. This research has a practical implication to the strategies about visual elements layout of print media's content format. This research can provide scientific methodology for verifying that how we set up the layout visual objects, how we allocate the portion of visual objects, and how much lead room do we need in screen.

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