

# Motivation Effect of Illustrations in Text Comprehension: An Eye-tracking Study

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Suppose that you grab a newspaper and find an article including an illustration that looks interesting. You may read it. If it comes without an illustration, however, you may or may not read it. We call this phenomenon the *motivation effect of illustrations*. Shimada and Kitajima (2006) proposed an experimental method to evaluate motivation effect of illustrations in manuals and demonstrated that illustrations in the manual used in the experiment had a motivation effect. In this study, we further investigate the processes that cause the motivation effect of illustrations by analyzing eye-tracking data.

## Method

Nineteen adults (10 females and 9 males; age 19 to 29) participated in the experiment.

We created a set of experiment materials by revising an existing disaster evacuation manual provided on the Web by Kawagoe City, Japan. Figure 1 presents one of the pages. We created two types of pages, illustrated pages consisting of illustrations and text (8 pages), and unillustrated pages consisting of only text (8 pages). These pages were presented on a computer display, and participants' eye-movements were recorded using a Tobii x50 eye-tracker.

We presented the pages to the participants in random order. They were allowed to glance at each page for two seconds and were then asked to answer the following two questions. (a) "Did the page motivate you to read?" (b) "Did the page look easy to understand?" They were asked to evaluate their responses on a five-point scale from 0 "No, not at all" to 4 "Yes, definitely" to give a motivation-to-read score and an understandability score, respectively.



Figure 1: Illustrated page. Note that Kawagoe City has permitted the use of the Web materials for publication.

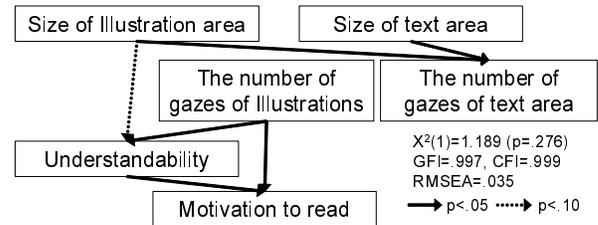


Figure 2: Result of structural equation modeling. Note that the non-significant effects ( $p > .10$ ) were removed from the figure.

## Results and Discussion

First, we checked the motivation effect. The mean motivation-to-read score for illustrated pages (3.0) was significantly higher than that for unillustrated pages (1.9) ( $p < .01$ ). This result demonstrates the motivation effect of illustrations and is consistent with our past experiment (Shimada and Kitajima, 2006).

Next, we examined the relationship among motivation effect, understandability, and the number of gazes on illustration areas or text areas using the eye-tracking data from the illustrated pages by structural equation modeling, as shown in Figure 2. We found two routes to enhance motivation.

One is the effect of the number of gazes of illustrations. In Figure 2, there was a significant relation between the number of gazes of illustrations and the motivation-to-read score. The result suggests that the more people gaze at illustrations, the more motivation is enhanced.

The other is the effect of the size of the illustration area. In Figure 2, the illustration size significantly affected the motivation-to-read score due to enhanced understandability. In contrast, the illustration size did not affect the number of gazes of illustrations. The results suggest that large illustrations enhance motivation, and the route is distinguished from that of the number of gazes on illustrations. The effect may be caused by improvement of the overall impression of pages, which includes large illustrations.

## References

Shimada, H., & Kitajima, M. (2006). Why Do Illustrations Promote Text Comprehension? Motivation Effect and Elaboration Effect. *Proceedings of the 5th International Conference of the Cognitive Science*, 185–186.