

# Effect of leading display design of dynamic information on users' visual performance and visual fatigue

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## ABSTRACT

Three experiments were planned in this study to investigate the effects of dynamic information display design on subjects' visual performance and visual fatigue. Dynamic information on VDT (Visual Display Terminal) was presented by means of "leading" display method which was conventionally used in internet homepage design. In the first experiment, visual performance was measured by the searching error percentage, and visual fatigue was measured by the difference of CFF (Critical Flicker Fusion) and subjects' subjective visual fatigue on a single searching task. The results of experiment 1 were as follows: (1) When speed was 250 wpm, the subjects' searching error percentage was lower than that of 300 wpm, and the change of CFF was smaller at 250 wpm; (2) Subjects' visual performance was improving when the color difference of text/background became larger; (3) When jump length was 0.35 cm/time or 0.7 cm/time (visual angle was approximately below 40.4 min), subjects had the best visual performance; (4) Subjects' visual performance was improving when the typeface was standard computer type; (5) Interaction by speed and typeface had significant effects on subjects' visual performance, when speed was 300 wpm, standard computer type has better performance. The task of second experiment was a reading task. Visual performance was measured by the error percentage of answering questions about reading contents, and visual fatigue was measured as the same method of experiment 1. The results of experiment 2 were as follows: (1) When jump length was 0.35 cm/time or 0.7 cm/time, subjects had the best visual performance; (2) Subjects' visual performance was improving when the color difference of text/background became larger; (3) Interaction by jump length and text/background color combination had significant effects on subjects' visual performance, when jump length was 1.05 cm/time, subjects' visual performance was improving when the color difference of text/background became larger; (4) All factors had no significant effects on subjects' visual fatigue. In the third experiment, the task included dynamic reading task and static searching task at the same time. Visual performance of dynamic reading task was measured by the error percentage of answering question of reading contents, visual performance of static searching task was measured by the searching error percentage, and visual fatigue was measured as the same method of experiment 1. The results of experiment 3 were as follows: (1) All factors had no significant effects on subjects' visual performance at static searching task; (2) When jump length was 0.35 cm/time or 0.7 cm/time, subjects had the best visual performance at dynamic reading task; (3) Subjects' visual performance at dynamic reading task was improving when the color difference of text/background became larger and when background color of dynamic and static tasks were white; (4) All factors had no significant effects on subjects' visual fatigue.

Keywords : dynamic information ; leading display ; visual performance ; visual fatigue

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