Research in Arts Education（2009），18，125-126。

Exploring the Effect of Balanced Configuration Upon Scanpath

Da-Lun Tang[1]

Che-Hsien Li[2]

Summary

Background

Western art has asserted that balance is the primary design principle for the composition of paintings. The balanced configuration is beneficial in reducing perceptual disorders by an induced structure. Balanced configuration is also considered as one of the most essential elements of aesthetics. However, there were only a few definitive evidences offered from objective or empirical aspects, so some researchers tried to explore the ubiquitous influence of the balanced configuration in aesthetic process by eye-tracking method which has been used as an effective evaluation tool of attention shift in psychology. According to Locher, eye movements may serve as a natural measure of both top-down and bottom-up processes between viewing behavior and aesthetics.

Nevertheless, many arguments and unexplored possibilities still exist. The first argument is that it is difficult to exclude confounding variables which were associated with balanced configuration of a painting in previous research. The second is a lack of statistical index to unfold both spatial and temporal properties of eye movement resulting from balanced configuration in data analysis.

Therefore, this study attempted to improve the experimental design and developed two kinds of objective indicators with mathematical parameters called “uniform index” and “progress index” to re-verify the influence of the balanced configuration during perception

[1] Associate Professor, Department of Mass Communication, Tamkang University.

[2] Graduate Student, Department of Information Communication, Chinese Culture University.

processes and clarify Locher's conceptual model.

The uniform index may represent the spatial uniformity of gaze distribution. The more even gaze distribution is, the less uniform index is. The progress index may represent the temporal change of different viewing phases such as diverse exploration and specific exploration which was proposed by Berlyne.

Method

In this study, we use the Tangram to construct well-balanced and ill-balanced stimuli by two experts in visual art. There were totally 40 pictures, 20 for well-balanced and 20 for ill-balanced stimuli respectively. By the method of convenience sampling, there were 25 participants who came from Chinese Culture University for psychology course credit. All of them were in lack of art training and had normal or correct to normal vision. The subjects were assigned to perform both the memory task and the balance judgment task by counterbalance procedure. In memory task, subjects were asked to choose the just previously seen picture between two options after viewing each stimulus randomly. In balance judgment task, subjects were asked to report balance level on a 9-point Likert scale after viewing each stimulus randomly. An IBM-compatible PC connecting to an EyeLink II was used to present the stimuli and to collect the eye movement data.

Result

According to ANOVA, the uniform index value was inversely proportional to subjective balance level. It indicated that the balanced configuration of a painting did influence the uniformity of fixation distribution in both memory and balance judgment task. In addition, according to curve fitting, the relationship between the balanced configuration and the progress index achieved significant level only in the balance judgment task, but not in memory task. It also implied that the balanced configuration partially influenced the tendency toward entering the specific exploration phase which was characterized by more fixation time and less saccadic amplitude. Overall, the data also highlighted the interaction role between sensory-driven and cognitive-driven processes exist in aesthetic evaluation.

Keywords: balance configuration, eye-tracking, scanpath