

Colored-hearing synesthesia: The relationship between color and music tonality

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Colored-hearing is one of the most well known aspects of synesthesia. We have studied colored-hearing, in particular music tonality-color synesthesia, from various viewpoints such as neurology, psychology, and multimedia. Two research activities will be discussed here. The first is a study on brain activity in colored-hearing synesthetes when listening to tonal music. The results showed that the color V4/V8 in the fusiform gyrus and the area of activity in the adjacent portions of the cerebellum were activated simultaneously. This provides evidence for the synesthesia cross-wiring hypothesis, which suggests that there is a neurological connection between the V4 complex and the cerebellum, and that the activity in the V4 complex occurs as a result of the activity in the cerebellum caused by hearing music. The second study analyzes the relationship between pictures (especially color) and music (especially music tonality) in actual TV commercials as an example of multimedia content. Multiplex correspondence analysis was applied to the categories “theme color” and “music tonality”. As a result, it can be stated that pictures in vivid color are matched to music in flat tonalities ((key F (b1), key (b2), etc.), and pictures in “calmer” colors are matched to music in sharp tonalities ((key G (#1), key D (#2), etc.). This indicates the same tendency of the combination of color and music tonality that some synesthetes have.