

Coherence between color and shape promotes interocular grouping during binocular rivalry

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Interocular grouping is a phenomenon in which incomplete visual elements presented to the two eyes are grouped together and perceived as an entirety during binocular rivalry. This phenomenon is a useful means to study conscious visual awareness, since it provides an unusual case where physical stimulation and observer's awareness are dissociated. Previous studies showed that individual features such as color and motion promote interocular grouping (Kim & Blake, 2005; Papathomas et al., 2005). The interaction between these individual features, however, has not been addressed. We performed a pair of experiments to investigate the influence of coherence between individual features on interocular grouping. Both the color (red/green) and the shape (circle/square) of partially occluded objects that comprised rival targets were systematically manipulated. Experiment 1: Observers tracked perceived shapes. Perception of complete shapes behind the occluder (circle or square) indicated incidence of interocular grouping. Perceived complete shapes were either in uniform colors (coherent) or in half red/half green (incoherent). Experiment 2: Observers tracked perceived colors. Perception of uniform colors behind the occluder (red or green) indicated incidence of interocular grouping. Perceived uniform colors were either in complete shapes (coherent) or in the shape of half circle/half square (incoherent). Results from Experiments 1 & 2 showed in concert that incidence of interocular grouping was greater in the coherent condition than in the incoherent condition. Conclusion: Color and shape promote grouping of incomplete features distributed between two eyes, only when these features are coordinated properly.

Acknowledgement: Supported by Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education, Science and Technology (20100028059)