

Feature misbinding of color and motion increases with degree of shared shapes

Sun, Y^{1,2}, Shevell, SK^{1,2,3}

¹ Psychology, University of Chicago, USA

² Visual Science Laboratories, Institute for Mind and Biology, University of Chicago, USA

³ Ophthalmology & Visual Science, University of Chicago, USA

Peripheral visual objects may be mistakenly perceived to have a feature of similar central-field objects. Consider red dots moving downward and green dots moving upward in the periphery, and red dots moving upward and green dots moving downward in the central visual field. The percept is often all red dots (in both center and periphery) moving upward and all green dots moving downward (Wu, Kanai & Shimojo, 2004). Here, a working hypothesis was that the likelihood of misbinding a central-field feature to a peripheral object increases with the number of shared visual features among central and peripheral objects. With central and peripheral objects that always share a common collection of features for motion (upward and downward) and color (red and green), as in Wu et al. (2004), misbinding should increase in frequency with the degree of shared shapes in central and peripheral fields. In the periphery, the stimuli were always downward moving red squares and upward moving green diamonds. Objects presented in the central visual field had (1) no shapes in common with peripheral objects (e.g., upward moving red circles and downward moving green circles); (2) one shape in common with peripheral objects (e.g., upward moving red squares and downward moving green circles, so squares were in common); or (3) two shapes in common (e.g., upward moving red squares and downward moving green diamonds, so both squares and diamonds were in common). Observers reported the perceived motion direction of the majority of peripheral red objects and green objects. Misbinding was reported in all conditions, with increasing frequency of misbinding from condition (1) to condition (2) to condition (3). The results show that the probability of misbinding color and motion increases with the total number of shared features among central and peripheral objects.

Supported by NIH grant EY-04802.