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Presentation Abstract

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Title: Eye of origin singletons outcompete the salient orientation singletons for gaze attraction despite their elusiveness to awareness

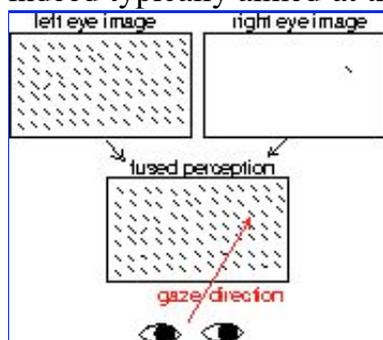
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Abstract: Human observers are typically unaware of the eye of origin of visual inputs. For example, the two images to the two eyes in the figure give a fused percept of many bars, obscuring their eye of origin. Recently (Zhaoping, *Journal of Vision*, 8(5):1,1-18, 2008), I showed that an ocular singleton, e.g., the input item to the right eye among all other items to the left eye, behaved as an exogenous attentional cue, such that visual search for an orientation singleton target bar among uniformly tilted distractor bars can be made easier, or more difficult, if the target, or one of the distractor bars, respectively, was an ocular singleton. Here I confirm that this ocular singleton indeed attracts gaze shifts automatically. As in the previous experiment, human observers searched for an orientation singleton among hundreds of distractor bars in a display schematized in the figure (using LCD shutter goggles to generate a dichoptic display). They had to report as soon as possible whether the target was in the left or right half of the display. Their gazes, which started before stimulus onset at the center of the display, were tracked using Electro-oculography (EOG). When there was a task-irrelevant ocular singleton bar on the opposite lateral side of the target from the center of the display (called a dichoptic incongruent stimulus, like the one in the figure), the first saccade after stimulus onset was typically directed to the lateral side corresponding to the ocular singleton, prolonging the reaction time for the task. In contrast, when all bars had the same eye of origin (monocular), or when the target bar was the ocular singleton (dichoptic congruent), the first saccade was typically directed to the lateral side corresponding to the target. In

another experiment, using an infra-red camera eye tracker for more accurate measurement (and a mirror stereoscope for dichoptic display, albeit with a smaller array of bars covering a smaller extent of the visual field), it was confirmed that the first gaze shift in the dichoptic incongruent trials was indeed typically aimed at the task-irrelevant ocular singleton.



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