

'Hollow-Face Illusion' Affects Estimates of Distance and Reaching Tasks

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A person's prior knowledge of the geometry of faces affects his or her ability to estimate distance and complete visually guided reaching tasks according to a study published in the June issue of *Journal of Vision*, an online, free access publication of the Association for Research in Vision and Ophthalmology (ARVO).

In a joint study by the University of Minnesota in Minneapolis, and the University of Giessen and the Max-Planck-Institute Tuebingen, both in Germany, researchers used the "hollow-face illusion" to test if the perceived shape of a face also affects participants' reaches and verbal estimates of distance. "Hollow-face illusion," in which a hollow mask viewed from a distance looks like a normal convex, occurs because prior knowledge of the shape of the face is sufficient to override the true depth indicated by other cues such as binocular disparity.

Study participants viewed concave and convex faces and made verbal and reach estimates that indicated their perceived shape of the face. In the verbal task, participants gave a verbal estimate of the distance from their viewing position to either the nose or the cheek of the faces.

In the reaching task, participants touched either the nose or cheek of the face within a certain period of time. The time limit was imposed to ensure the response time was similar to that of the verbal task. The study's data show that the magnitude of the hollow-face illusion is similar for reaching tasks and verbal tasks.

Volker H. Franz, PhD, one of the study's researchers says, "We show that prior knowledge about the general shape of faces can interact with the information the person acquires from vision at the time of the action. Without the knowledge that they are reaching to a face and what the typical shape of a face is, participants would perform the reaching movements differently. This stresses the importance of object recognition even for very simple motor tasks and shows that humans perform these actions in a more complex way than, for example, typical applications in robotics which do not take into account prior knowledge about objects."

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