

How does cue combination work when one cue is removed? Comparison of the results of two methods for removing gravity.

Laurence R. Harris, Richard Dyde, Michael Jenkin, Heather Jenkin

Centre for Vision Research, York University, 4700 Keele Street, Room 0009 CSEB, Toronto, Ontario, M3J 1P3

The perceptual upright (PU) is determined multimodally by a combination of visual and non-visual sensory cues, together with an internal representation of the body's orientation. We measured the influence of the orientation of the visual background on the PU with and without gravity. Gravity was cancelled using parabolic flight or redirected from its customary alignment with the long axis of the body by having people lie supine. Control measures were taken under normal gravity. Participants looked at a polarized, natural scene in various orientations on a laptop that was viewed through a hood which occluded all other vision. Superimposed on the scene was a character the identity of which depended on its orientation. The orientation of the perceptual upright was defined as half way between the orientations at which the character was maximally ambiguous. The visual background affected the orientation of the PU less when in microgravity than when upright in normal gravity and more when supine. These data are discussed in terms of a weighted vector sum model using the orientations of gravity, vision and the body to determine the PU. The increasing influence of vision when supine is predicted, but the decrease during parabolic flight requires a non-linear change in visual weighting.