

Li, J., M.M. Cohen, C.W. DeRoshia and L.E. Guzy. Effects of observer orientation on perception of ego- and exocentric spatial locations. Perception 26(Suppl.): 102-103, 1997.

Gravitational Research Branch, NASA Ames Research Center, Moffett Field, CA 94035
fax +1 415 604-0511; e-mail: jli@pioneer.arc.nasa.gov

Perceived eye position and/or the perceived locations of visual targets are altered when the orientation of the surrounding visual environment (Cohen, Ebenholtz & Linder, 1995, *Perception & Psychophysics*, 57(4):433), or that of the observer (Cohen & Guzy, 1995, *Aviation, Space, and Environmental Medicine*, 66:505), is changed. Fourteen subjects used biteboards as they lay on a rotary bed that was oriented head-down (-) 15°, -7.5°, supine, head-up (+) 7.5°, and +15°. In the dark, subjects directed their gaze and set a target to the apparent zenith (exocentric location); they also gazed at a subjective "straight ahead" position with respect to their head (egocentric location). Angular deviations of target settings and changes in vertical eye position were recorded using an ISCAN infrared tracking system. Results indicated that, for exocentric locations, the eyes deviate systematically from the true zenith. The gain for compensating changes in head/body orientation was .76 and .85 for gaze direction and target settings, respectively. In contrast, "straight ahead" eye positions were not significantly affected by changes in the subject's orientation. We conclude that subjects make systematic errors when directing their gaze to an exocentric location in near-supine positions. This suggests a systematic bias in the integration of extra-ocular signals with information regarding head/body orientation. The bias may result from underestimating changes in the orientation of the head/body in space. In contrast, for egocentric locations, where head/body orientation information can potentially be discarded, gaze directions were unaffected by head/body orientation.