Psychophysical Function for Perceived Gravitational-Inertial Force Does Not Depend on the Orientation of the Otolith Organs ***(Abstract Only)***

Cohen, M. ; Welch, R. ; Deroshia, C.
National Aeronautics and Space Administration, Moffett Field, CA. Ames Research Center.

14 May 92 , 1p
Language: English
In Aerospace Medical Association, Aerospace Medical Association 63RD Annual Scientific Meeting Program
Aviat. Space Environ. Med 63: 387, 1992.

Abstract: It has generally been believed that the perceived intensity of a gravitational-inertial force depends on both the magnitude and orientation of the force with respect to the otolith organs, as does the elevator illusion. In this study, we examine the perceived intensity of Gz force and the elevator illusion as a function of the applied force and the orientation of the subject's head. Methods: Each of 7 male subjects was seated upright in a swinging chair mounted in the Ames 20-G Human Centrifuge while he set a visual target to his apparent horizon and judged the perceived intensity of Gz forces by cross-modal matches on a hand dynamometer. Plateau Gz levels were 1.00 1.25, 1.50, 2.00, 2.25, and 2.50; a 30 second ramp to plateau was used in all cases, and the duration of exposure at each plateau was 120 seconds. All measures were obtained both with the subject's head erect and pitched forward 30 degrees. Results: Although the elevator illusion changed with head orientation (F(6,60) = 7.56; p less than 0.001) the perceived intensity of Gz was essentially the same for both orientations of the head (F (6,60) = 0.61; p greater than 50). Conclusions: The results of this experiment suggest that the perceived intensity of gravitational-inertial force does not depend on otolith mechanisms in the same way as does the elevator illusion and that somesthetic, tactile, and other proprioceptive inputs are important for the psychophysical function.

Subjects:

- Aerospace medicine
- Attitude (Inclination)
- Elevator illusion

- Exposure
- Gravitational physiology
- Human centrifuges
- Otolith organs
- Proprioception
- Sitting position
- Dynamometers
- Horizon
- Males
- Seats
- Target acquisition
- NTISNASA
- E Space Technology--General
- Medicine and Biology--Stress Physiology

Dialog® File Number 6 Accession Number 1855741

NTIS Accession Number N95-16740/9