FEBRUARY 1998

North is up…I think (NASA-Ames Research Center, Mountain View, CA; San Jose State U., CA): "Background: If an observer first learns to recognize an object in a specific orientation, a significant increase in processing time usually occurs when the object is subsequently seen in a different orientation; this phenomenon is called the 'misorientation effect.' The present study examines how quickly and how accurately human observers discriminate between airport maps that are viewed in orientations other than those in which they were initially learned. Method: Participants were trained to discriminate between two navigation maps that were seen in only one orientation; they subsequently were tested with maps and aerial photographs of the same airports that were presented in various orientations. Results and Conclusions: There were three principal findings: a) discriminative responses to maps of airports were most rapid when the maps were seen in the same orientation as that in which they were initially learned; b) a significant reduction in reaction time (RT) occurred with repeated presentations of the misoriented stimuli; and c) information learned from navigation maps was not sufficient for all observers to recognize aerial photographs of the same airports."[3]

FEBRUARY 1973

Prospects of artificial gravity (National Aeronautics and Space Administration, Washington, DC): "This paper reviews findings for American astronauts which may indicate some alteration in vestibular response related to exposure to zero gravity. Of 25 individuals participating in Apollo missions 7-15, nine have experienced symptomatology that could be related to the vestibular system. The apparent divergence between these results and Soviet space program experiences, which initially appears great, may reflect the greater emphasis given by Soviet investigators to vestibular aberrations. Presently the incidence of motion sickness, long known as an indicator of vestibular disturbance, seems too low to warrant any positive statement regarding inclusion of an artificial gravity system in future long-term space missions. Where motion sickness has occurred, adaptation to weightlessness has always resulted in abatement of symptoms. In the absence of biomedical justification for incorporating artificial gravity systems in long-term space flight vehicles, engineering considerations may dictate the manner in which the final ballot is cast."[1]

Impact of pilot workload (RAF Institute of Aviation Medicine, Farnborough, Hampshire, UK): "The workload of a pilot during the let down of a Boeing 707 was modified by coupling the aircraft to the I.L.S. localiser and glide slope path (coupled approach) or by increasing the participation of the co-pilot in the handling of the aircraft (shared approach). The electrocardiogram of the pilot was recorded during the let down and finger tremor was recorded after landing. The mean rr intervals around touch down of the coupled approaches, which were all of low workload, were increased compared with let downs of equal difficulty handled throughout by the pilot (manual let down). In the shared approaches to 1,000 ft the relation between the mean rr interval around touch down and workload was similar to that for manual let downs but shared approaches to 500 ft increased the mean rr interval around touch down over let downs of a wide range of difficulty. The appearance of finger tremor was not affected directly by the modified workload approaches. It is concluded that flight deck workload patterns during the initial part of the approach influence the neurological state of the pilot around touch down."[4]

FEBRUARY 1948

Man-machine interface (Office of Naval Research, Port Washington, NY): "The importance of considering the human factor in aircraft design and function does not require emphasis and elaboration before this association. As in the case of many other modern technological developments, the physical and engineering sciences have now produced types of aircraft whose over-all performance is, or soon will be, bound by the psychobiological characteristics of their operators rather than by engineering design or structural limitations. Because of this circumstance it became necessary to introduce the concept of designing equipment in terms of its operator. Within the past few years this notion has been expounded by representatives of the various medical sciences, and we find that teams of medical men, physiologists and psychologists are now engaged in joint effort with aeronautical engineers to produce the optical man-machine combination…

"The pilot's relationship to the machine which he directs may be analyzed into three aspects of equipment, namely, *display*, *layout*, and *control*…

"For the avoidance of fatigue in long-duration air operations, the posture of the pilot and other crew members deserves careful consideration…

"The Human Engineering Section of the Special Devices Center of the Office of Naval Research is administering contracts in the field of human engineering…

"One final human engineering project should be mentioned. The psychologist and the engineer have been brought together as a working team only during the past few years. It has become recognized that there is something to be gained by designing equipment in terms of the man who must use it."[2]

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