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ONT/ASEE Postdoctoral Fellowship Program

Final Report

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This report describes the Landing Craft Air Cushion (LCAC) vehicle operator/engineer selection research activities undertaken since August 1988. Relevant literature and Navy LCAC personnel interviews resulted in a description of entering LCAC operator/engineer trainee skills and knowledges. Based on the literature review and the experience of key NAMRL psychologists an LCAC operator/engineer selection test battery was developed and automated for testing on an Apple IIe Computer.

The battery's basic components are similar to those of NAMRL's naval aviation experimental test battery. The LCAC battery was designed to select those candidates most likely to succeed in training and in operational environments. The battery consists of automated perceptual/cognitive psychological tests including performance-based single and multiple-task tests and a personality and biographical inventory. Key tests include Dichotic Listening and Psychomotor tests performed under multiple-task conditions. These tests measure divided attention and eye-hand-foot psychomotor coordination. Other tests include the Manikin task, one-dimensional tracking and digit cancellation tasks, work and family orientation questionnaire, and the risk taking test. These tests measure reaction time, spatial orientation, short-term memory, achievement motivation, and risk taking tendencies. The test battery requires approximately two and one-half hours per test subject.

For an initial concurrent validity study, thirty-two operators, engineers, training officers, and related personnel from two operational units (Assault Craft Unit 4 in Little Creek, VA, and Assault Craft Unit 5 in San Diego, CA) have been administered the test battery. In addition, one automated test station was delivered on-site to Panama City, FL (LCAC Basic training facility) for a predictive validity study. Basic training grades for the majority of operators and engineers currently in operational environment have been acquired. These grades consist of underway training hours, an underway training grade, and an academic classroom grade.

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Utilizing Zenith Data Systems' Microstat statistical software, LCAC database containing subjects' background characteristics, test scores and training grades were established. Input data files were created through Microstat's Data Management Subsystem. Data were listed, verified, and edited prior to use. Data were sorted by subjects' classification, operational unit, and demographic attributes. Descriptive statistics, subjects' rankings, and correlation procedures of appropriate scores were performed.

Preliminary analyses indicate significant correlation coefficients between training criteria and certain test scores. Training grade correlated positively with a single task Dichotic Listening test and a Psychomotor task in multiple conditions. Training hours were significantly correlated with both single and dual Dichotic Listening tasks, number of correct response on the risk taking task, and reaction time on the risk taking task. Training hours were also significantly related to number of incorrect responses on the Manikin test. Classroom grade correlated positively with the stick-rudder-throttle conditions of the psychomotor task and were negatively related with reaction time on the digit cancellation in dual with the tracking task. These findings suggest that the battery has the potential to predict LCAC training performance. The findings will be verified when the required predictive and cross validation studies are completed.

Other activities that have occurred since last August include:

1) Preparation and submission of a research abstract to the Aerospace Medical Association for possible presentation at its 1989 meeting in Washington DC. The abstract entitles 'Use of a Pilot Profile to Assess the Training Performance of Student Naval Aviators'. Data for this paper were obtained from TESTPLUS version of the Adult Personality Inventory previously reported.

2) Nontasak, et. al. paper, 'Determinants of Naval Flight Officer Program Entry and Pipeline Choices' (Aviation, Space, and Environmental Medicine - January 1988), was sent to Israel upon the request of Dr. Jair Luz of Occupational Health and Rehabilitation Institute at Loewenstein Hospital.

A final comment: From the bottom of my heart I would like to sincerely thank all of what ONT/ASEE has done for me in the past years. The research experience has been tremendously enriching. I engaged actively in research of importance to the mission of the laboratory and the Navy. This experience has substantially increased my professional development and effectively prepared me to continue conducting research of interest to the Navy. I would strongly recommend this highly competitive postdoctoral program to my faculty colleagues as a favorable means of advancing their careers.



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