

Report of the Personnel Selection and Classification Sub-TAG, HFETAG-63  
Tempe AZ, 3-6 May 2010  
Richard D. Arnold, chair

The Personnel Selection and Classification SubTAG met on 5 May 2010, in conjunction with TAG-63, in Tempe AZ. There were 16 SubTAG members in attendance. Three formal presentations were heard, as abstracted at the end of this report.

Business: SubTAG business consisted of the election of a new chair. LT Peter Walker was the sole nominee, and was elected by a unanimous vote. There was discussion of the desirability of rotating the chair between the services, since the Navy has held the chair consecutive terms, but there were no candidates from the AF or Army. The SubTAG resolved to improve membership recruitment efforts in those services, and may look to expanding from a single chair to a tri-service co-chair arrangement in the future.

Presentation abstracts:

**Title: Prior Flight and Simulator Experience as Predictors of Naval Aviation Selection Test and Training Performance**

**LT Brennan Cox**  
**Naval Aerospace Medical Institute**

The Performance-Based Measurement (PBM) test is a naval aviation selection tool designed to assess psychomotor skills left untapped by the Aviation Selection Test Battery (ASTB). Candidates perform the PBM using a joystick and throttle device while receiving visual and aural information from a computer monitor and headset. Initial concerns during test development were that candidates with prior flight or simulator gaming experience might perform differently on the PBM compared to those without such experience. The current study evaluates these concerns by examining students' performance on both the PBM and in flight training based on their prior flight and simulator gaming experience.

**Title: Time-Sharing: A Critical Component of Pilot Situation Awareness (SA)**

**Cheryl A. Bolstad**  
**SA Technologies**

Endsley and Bolstad (1994) conducted one of the first studies to determine to locus of individual differences in pilot Situation Awareness (SA). They had retired fighter pilots complete a battery of tests designed to measure their abilities along key dimensions hypothesized as important for SA. These measures were then compared to pilot's actual SA abilities as measured in simulated air-to-air engagements. One of the strongest

correlations was psychomotor skill. The authors hypothesized that pilots, who possess good tracking skills, are able to devote much more of their attention towards the assessment of the situation instead of manually flying the aircraft, and thus leading to higher SA. This is consistent with other research has shown that experienced pilots have better time-sharing abilities than novice pilots (Damos, 1972; O'Hare, 1997) and individuals with better SA also have an improved ability to share attention (Gugerty & Tirre, 1997).

As part of a 3-year research program SA Technologies and Embry Riddle Aeronautical University (ERAU) created a time-sharing module to teach higher order cognitive skills that underlie good Situation Awareness (SA). The module developed was designed to be self-guided and, in order to keep pilots' interest, have some content validity as well as a game-like appearance. The program consisted of four separate tasks: a psychomotor tracking task, a search task, a monitoring task, and an ATC communication task. We also incorporated a time-sharing component similar to the one used in the earlier study (Endsley & Bolstad, 1994).

The program is created in Microsoft Visual Basic. It is a stand-alone program that runs on a Windows-based personal computer. The module consists of the four separate tasks that can be run alone or in combination with each other. Participants receive feedback on their performance and data is recorded for later analysis. All of the individual tasks, except the psychomotor tracking task, have three difficulty levels (1, 2 and 3), with 1 being the easiest and 3 being the hardest. While the program was developed for training purposes it could easily be used to assess a pilots time-sharing and tracking abilities. This program will be demonstrated at the TAG meeting.

**Title: Validity of a performance-based test battery for the selection of Naval aviators and flight officers.**

**Jeffrey B. Phillips**  
**Naval Aerospace Medical Research Laboratory**

With the goal of significantly improving upon the predictive validity of the Performance Based Measure (PBM), work must be done to expand upon current PBM scoring procedures. Research was conducted to improve upon the predictive validity of the PBM through the development of a standard comprehensive scoring algorithm for the PBM, and the evaluation of the predictability of two self-report measures. Each of these measures was then validated through its ability to predict performance in Naval flight school.

A performance based PBM scoring algorithm has been developed and has been shown to provide a significant improvement over current selection methods. In summary, the incremental predictive validity of the PBM in addition to the PFAR (Pilot Flight Aptitude Rating) increased as criterion scores shifted from academic to non-academic portions of

flight training. In other words, the incremental validity increased as the criteria became more analogous to actual flying.

The addition of the PBM to current aviation selection procedures will significantly improve current pilot candidate selection techniques by reducing attrition associated with non-academic issues, e.g., lack of adequate spatial ability or psychomotor skills. All validated aspects of this project were transitioned to NAMI for inclusion into the Aviation Selection Test Battery.