CCVT mitigates the shortcomings of currently used tests.

These tests are subject to operator errors (lighting, timing, plate fading) and do not delineate the type and degree of color vision deficiencies. The CCVT mitigates the shortcomings of currently used tests.

The Naval Aerospace Medicine Institute (NAMI) has noted up to 3% of aviation applicants are color deficient. NAMI has developed a Computerized Color Vision Test (CCVT) that detects, classifies and quantifies the degree of color vision deficiencies.

Published studies have shown the CCVT correctly identified all color deficient applicants (n=35), as confirmed by the Nagel Anomaloscope and did not misclassify any color normal applicants. Preliminary findings have shown the CCVT correctly identified all color deficient applicants, as confirmed by the Nagel Anomaloscope and did not misclassify any color normal applicants.

The Ishihara PIP has, under ideal conditions, a sensitivity of 98.7% (Birch, 1997). Our Ishihara sensitivity was lower possibly due to non-ideal testing conditions. The lower color deficiency prevalence in naval aviation applicants is presumably because of pre-screening examinations. However, a higher number of color deficient applicants than expected are passing the pre-screening.

The FALANT test was developed as an occupational suitability test for ship drivers during World War II and was designed to pass 30% of color deficient individuals (Laxar, 1998). The current utility of the FALANT as an aviation color vision screening test has been questioned (Cole & Maddocks, 2008). Our preliminary findings suggest that over 50% of color deficient applicants are able to pass the FALANT.

With the increasing prevalence of modern multicolor aviation instrumentation in the air and on the ground, legacy screening exams may no longer be adequate. Some authors feel a reliable and reproducible color vision test is needed in the U.S. military that does not require operator training (Monlux, Finne, & Stephens, 2010). Our findings suggest the CCVT will provide accurate and standardized color vision screening. Formal studies of the CCVT may be warranted.

Conclusions

- Based on preliminary findings the CCVT has increased sensitivity and specificity compared to the Ishihara PIP and FALANT, and is comparable to the Nagel Anomaloscope.
- The design of the CCVT reduces administration errors.
- Current color vision screening tests fail to identify all color deficient applicants.
- The CCVT appears to be a reliable, sensitive, and specific test for screening color vision in aviation applicants.

References


Disclosure

We have no financial relationships and will not discuss off-label use and/or investigational use in our presentation.