Appendix B
Psychometric Properties of the biVABA

Note: The biVABA is not a diagnostic battery designed to classify persons as having a specific vision impairment. Therefore, you will not find it used in research studies that focus on classifying vision impairment in adults with acquired brain injury. Instead, it was designed as a clinical intervention tool that uses standardized visual assessment to screen for vision impairment, interpret the results, and use them to develop an intervention plan.

The biVABA includes three standardized visual screening charts accepted as valid and reliable test charts by ophthalmologists and optometrists internationally. Two charts were developed by Lea Hyvarinen MD, a pediatric ophthalmologist and internationally recognized authority on visual assessment of adults and children with vision impairment. The charts are the *Lea Numbers Intermediate Acuity Test Chart* (also known as the Lea Numbers Test Chart for Vision Rehabilitation) and the *Lea Numbers Low Contrast Flip Chart using 10M Optotypes*. The Lea charts conform to internationally established standards for visual acuity charts.[1] Validity and reliability for the Intermediate Acuity Test Chart has not been established. However, a version of that chart-the *Lea Numbers Low Vision Book*-presents the same optotypes in a book format. This chart was compared to the gold standard ETDRS chart. Correlation between the "book" and the ETDRS was r =.95 and retest was 0.159/-0.200.[2] The *Lea Numbers Low Contrast Flip Chart using 10M Optotypes* has also not been studied directly but a version of the chart using symbols was studied in preschool children and shown to compare favorably to the gold standard Peli Robson test.[3] The third screening chart is the *Damato Campimeter* developed by Bertil Damato MD. Rowe et al.[4] established validity for using the chart to identify central field deficits by comparing it to the gold standard Humphrey Visual Field Analyzer. The study reported a sensitivity of 81% and a specificity of 72% for the campimeter.

The *Warren Text Card* is a modification of the Lighthouse Near Vision Reading Card, a widely used chart that meets the standard as a reading acuity test chart. The tests that measure oculomotor performance use procedures taught in textbooks and routinely used by ophthalmologists, optometrists, and neurologists. The instructions for administering and interpreting these screening tests were reviewed by two ophthalmologists who deemed them accurate. Because these tests have been accepted as valid assessments by experts in oculomotor screening, it was not necessary to re-establish their validity.

The *Design Copy Test* is adapted from the literature. The seven visual search subtests use a cancellation test format. The format has been used extensively in research on neglect and has good validity established by research going back as far as 1976.[5] I published information on the scanning patterns observed on the subtests in 2008.[6]

Validity for the ScanBoard test was established in a 1990 study published in the American Journal of Occupational Therapy (AJOT).[7] Validity and reliability for the ScanCourse was

established in 2021 in two articles published in AJOT by Lund et al.[8] and Chau et al.[9] Test inter-rater reliability was ICC=.998; test-retest reliability was ICC=.912. ScanCouse validity was established by comparing it to the Trails A and B test and the Bells Test. The ScanCourse significantly correlated with Trails A and B but not the Bells test.

As far as I am aware the biVABA has been used in only one published research study.[10] Cate and Richards used it to identify visual deficits in persons post brain injury.

<div align="center">References</div>

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