



ALFAB: The Alberta Language Function Assessment Battery

Chris Westbury

Department of Psychology, University of Alberta, Edmonton, AB, T6G 2E9 Canada.

WHY YET ANOTHER APHASIA BATTERY?

The Alberta Language Function Assessment Battery (ALFAB) is a new aphasia battery that is unique among aphasia batteries for several reasons:

i.) **The ALFAB has been expressly designed as a research instrument** to bridge between experimental psycholinguistics and aphasiology. The 28 subtests in the ALFAB are constructed like psycholinguistic experiments, with tight control and crossing of multiple factors. Many tests are controlled on the same factors, allowing for meaningful comparisons between tasks on performance with particular types of stimuli (for example, high or low phonological neighbourhood abstract or concrete words; high or low frequency regular or irregular words; short or long concrete or abstract words, and so on).

ii.) **The ALFAB is totally computerized**, both in its administration and its scoring. Custom-designed computerization allows the ALFAB to be easy to administer, in ways that are convenient for both the assessor and those being assessed. The assessor can move very quickly between tests. The tests are scored as they are administered and results are saved to tab-delimited text files. It runs on Windows and Apple Macintosh systems.

iii.) **The ALFAB measures reaction times with millisecond accuracy.** Though these are often of little use with aphasic populations (because their RTs are generally too long and too variable to be informative), they do allow us to get reasonable measures of item difficulty from normals, and can in some cases be used as a measure of aphasic deficits, or as an early warning sign of a functional deficit.

iv.) **The ALFAB presents stimuli and records responses using modern media.** The ALFAB uses CD-quality sound both for presenting auditory stimuli and for recording individual responses from our subjects. Each spoken item's response is saved to its own sound file so that error types can be scored off-line. Images used in naming and recognition tasks are full color photographs. The ALFAB uses color-coded animated movies during the sentence production tasks, in order to elicit different syntactical constructions. The ALFAB includes a clock for timing production tasks such as word fluency, which is fully integrated into the testing environment.

v.) **The ALFAB uses software that is custom-designed for addressing the potential frustrations that can arise when administering computerized batteries.** Because it has been specifically designed for assessment of the elderly and brain-damaged, rather than being jury-rigged experimental software, the ALFAB software includes special features that are often needed with elderly and clinical populations:

- A log file is kept for every subject, showing tests completed and aborted, making it easy to track multi-session assessments.
- Stimuli can be repeated with a single key press; It is possible to return several stimuli back.
- Testing can be paused in mid-test without affecting the timing of responses already gathered or waiting to be gathered.
- Tests can be aborted with a single key press.
- Note-taking functionality is built-in so that the administrator can quickly and easily make notes about special circumstances, clinically-relevant observations, or anything else.
- The full computerization of the aphasia battery, and the enabling of off-line scoring of some of the production data, makes it possible for the battery to be administered in a wholly standardized fashion by non-experts.

vi.) **The ALFAB has been extensively normed.** The tests have been administered to a sample of 45 - 145 elderly normal subjects.

vii.) **The ALFAB is 'open source', and is being distributed free of charge under a Creative Commons license.** This is because:

- An open source model allows for the possibility of international collaborative improvements and extensions to the battery as it currently stands. This will enable the development of tests that assess aspects of language in more depth or with greater subtlety than is possible with the present version of the ALFAB, as well as making it possible for the development of subtests in languages other than English.
- It is very difficult for any one site to collect sufficient data for serious statistical analysis about the role of a wide range of factors in aphasic deficits, so we want your data (see our offer below).

viii.) **We will score the ALFAB results for you.** We invite qualified researchers who administer *the entire battery in its canonical form* to contribute their anonymous aphasic dataset to a database of ALFAB results that we are developing. In return for data from a full administration of the ALFAB to aphasic participants, we will automatically score the results for you. We have developed software in parallel with the ALFAB that uses a rule-based system for scoring the subtests of the ALFAB. At the current time, our scoring program produces a complete standardized (z-scored) scoring of over 350 individual measures (factors and select pair-wise factor crosses) from the ALFAB. We are presently developing a set of production rules that will do much more than simply score the results: it will present and interpret them by producing a structured, human-readable assessment report that will include results of statistical tests of differences and will present between-test comparisons on all factors that are manipulated between tests. We will provide such a report for any complete data set we receive, in return for allowing us to include the dataset in our result database. At present ALFAB result files must be mailed in on a CD; however, if there is sufficient interest in this automated scoring service we will quickly develop a web-based interface for submission of datasets.

THE 28 SUBTESTS OF THE ALFAB

- 1.) Demographic Information
- 2.) Phoneme Discrimination
- Repetition
- 3.) Repetition of Monomorphemic Words & Nonwords
- 4.) Repetition of Multimorphemic Words
- Lexical Decision
- 5.) Visual Lexical Decision
- 6.) Auditory Lexical Decision
- Morphological Decision Tasks
- 7.) Morphological Division Judgment
(Is the word split legally?)
- 8.) Morphological Semantic Judgment
(Which part of the word is more important?)
- 9.) Rhyme Judgment
- 10.) Reading
- Spelling
- 11.) Spelling Monomorphemic Words
- 12.) Spelling Multimorphemic Words
- Word Fluency
- 13.) Oral Word Fluency
- 14.) Written Word Fluency
- 15.) Morphological Word Fluency
- Word-Picture Matching
- 16.) Visual Word-Picture Matching
- 17.) Auditory Word-Picture Matching
- 18.) Visual Multimorphemic Word-Picture Matching
- Synonym Judgment
- 19.) Auditory (Concrete & Abstract) Synonym Judgment
- 20.) Written (Concrete & Abstract) Synonym Judgment
- 21.) (Written or Auditory) Multimorphemic Synonym Judgment
- Picture Naming
- 22.) Written Picture Naming
- 23.) Oral Picture Naming
- 24.) Sentence Sensibility Judgment
- 25.) (Written or Auditory) Idiom Literality Judgment
- Syntax Production & Comprehension
- 26.) Visual Sentence Comprehension
- 27.) Auditory Sentence Comprehension
- 28.) (Written or Oral) Sentence Production

Acknowledgements: This work was supported by the Alberta Heritage Foundation for Medical Research.