Introduction

Clinicians generally have limited time to evaluate their aphasic clients, and thus are often unable to include discourse-level language in their assessments. Sampling and analyzing language at the discourse level by hand can be very time-consuming, but since it is the level at which day-to-day communication occurs, it provides important information about language use and competence in context. It can also point the way to functional goals for therapy.

In this presentation we will illustrate the use of EVAL, a recent addition to the wide array of CLAN computerized language analysis programs freely available from TalkBank (MacWhinney, 2000). EVAL is designed for quick and simple use by clinicians. It measures 25 language characteristics in a transcription of discourse and displays them in an Excel spreadsheet. It can then compare the results with those of a comparison group selected from the AphasiaBank database, or it can compare the results with those of the same participant at earlier or later measurement times (e.g., pre- and post-therapy). It is based on a simplified system of transcription and error coding, designed with the time constraints of busy clinicians in mind. While transcription is done in the CHAT format required for CLAN programs, it can be less detailed.

Methods

The EVAL analyses include duration, total utterances, utterances used to calculate MLU, MLU in words, MLU in morphemes, types, tokens, clauses per utterance, word-level errors, utterance-level errors, words used for morphophonemic tagging, nouns, plurals, verbs, third person singular, first and third person singular, past tense, perfect, progressive, prepositions, adverbs, conjunctions, determiners, pronouns, retracings, and repetitions. The resulting spreadsheet lists the numbers of each these characteristics produced in each analyzed transcript. When transcriptions are compared to a sample from the AphasiaBank database, the program indicates the difference between the transcript results and the mean of the comparison group as a proportion of the standard deviation.

EVAL can be run on an abbreviated version of CHAT transcriptions or fully detailed and coded transcriptions. The CLAN program MOR performs a morphophonemic analysis on the completed transcript, and EVAL uses that information to complete its analysis. At its most basic level, a transcription could be done with no special coding for errors, retracings (revisions), and repetitions, and the EVAL program would yield all of the parts-of-speech and morphological data. Any social or off-task comments can be omitted, and gestures and fillers need not be coded. If errors are of interest, two simplified error codes, one for word-level errors and one for utterance-level errors can be used in the transcription. If retracings and repetitions are of interest, those can be transcribed and coded as well for analysis. Full instructions for transcription and for running the program are available at the

AphasiaBank site in the EVAL manual (http://talkbank.org/AphasiaBank/manuals/eval.pdf).

For this demonstration we chose two people with aphasia (PWAs), both AphasiaBank participants, who had been assessed at least twice using the AphasiaBank Protocol. We chose one participant whose Western Aphasia Battery (WAB, Kertesz, revised, 2007) Aphasia Quotient (AQ) increased across the two testing times, and one whose WAB AQ score decreased. Both participants were female, and both had a history of a single left hemisphere stroke. They were volunteers from an aphasia center, and neither was receiving formal individual aphasia therapy. See Table 1 for participant demographic information.

The AphasiaBank protocol includes tasks of four different discourse types, and a number of aphasia tests. For this analysis, we selected a picture description task. The stimulus was a four-panel picture of a boy kicking a soccer ball through a window, to the surprise of the man inside. Each task is labeled a "Gem" in our transcriptions, and the name of this Gem is "window". Using the EVAL program, we selected that Gem from the full transcript and compared the characteristics of each person's first and second "window" picture descriptions. For Participant 1, whose WAB AQ had improved almost to the normal cutoff, we also compared her second transcript to data from a group of AphasiaBank controls, to see whether we could find salient differences that might be addressed should she receive treatment.

Results

EVAL showed evidence of differences on some measures in both participants' language. Table 2 provides the EVAL results for Participants 1 and 2 at first and second testing (P1-T1, P1-T2, P2-T1, P2-T2). The table also includes a column of data with the means for the control database on all of the measures. For this comparison, all controls between the ages of 40 and 75 were included (n=90).

Participant 1, whose WAB AQ increased, improved on a number of outcome measures, including for example number of utterances, number of words, MLU, and TTR. When compared with a group of controls, her TTR and clauses per utterance were two standard deviations below the mean of the controls, pointing the way to some possible treatment targets.

Participant 2, whose AQ decreased, produced more words and utterances, but showed decreases in MLU, TTR, and clauses per utterance, and also made more word and utterance errors. Clearly, clinical judgment is required to interpret these changes in light of what the clinician knows about the PWA.

Discussion

EVAL is a recently implemented language analysis program that has not yet been widely used clinically. It is intended to be a useful and relatively simple tool for

clinicians. It continues to be a work in progress, and the goal is to add new measures, especially measures of discourse content. In addition, some measures may be removed if they do not prove useful.

EVAL is not limited to small discourse samples. Users can choose to use larger samples, or a single sample containing several different kinds of discourse. It can also list the language characteristics as a percentage of the total sample rather than as numbers of occurrences, which can be useful particularly for larger transcriptions. The goal is to have a program clinicians can use on samples they can manage within their time constraints. Some EVAL measures, such as type/token ratio and mean length of utterance require a larger language sample to be valid for research purposes. However, these measures gain clinical salience by the fact that a person's performance on a given task can be compared to that of a large database of controls or of other PWA on the same task.

In this presentation we will also demonstrate other uses of EVAL. For example, a discourse sample can be compared to samples from a comparison group with the same aphasia classification or to samples from a selected group in a similar age range. Comparisons can be made to the entire control database, to the entire aphasia database, to all people with fluent or nonfluent aphasia, or to those of a particular WAB classification. The EVAL program presents various choices for each EVAL analysis, so the possibilities are many. We will demonstrate some of these uses.

References

Kertesz, A. (2007). *Western Aphasia Battery Revised*. San Antonio, TX: Psychological Corporation.

MacWhinney, B. (2000). *The CHILDES project: Tools for analyzing talk. Third Edition.* Mahwah, NJ: Lawrence Erlbaum Associates.

Table 1.

Demographic characteristics

	Participant 1		Participant 2	
	Time 1	Time 2	Time 1	Time 2
Age (yrs)	57.6	61.7	90.7	91.7
WAB AQ	54.1	91.1	65.7	57.1
WAB Aphasia Classification	Transcortical Sensory	Anomic	Conduction	Wernicke

Table 2.

EVAL results

	P1-T1	P1-T2	Control (mean for database)	P2-T1	P2-T2
Duration (seconds)	15	20	37	20	23
Total utterances	1	4	9.9	4	6
MLU (words)	4	5.25	10.4	8.25	6.67
Types	3	18	54.2	27	27
Tokens	4	21	88.1	33	40
TTR	.75	.86	.64	.82	.67
Clauses/utterance	1	.25	1.27	1.75	.67
# word errors	0	0	.02	0	5
# utterance errors	0	2	*NA	0	3
# nouns	2	5	21.9	4	8
# plurals	0	0	1.4	0	0
# verbs	1	1	12.8	7	4
# 3rd person sing.	1	2	7	4	3
# past tense	0	1	3.8	3	1
# perfect tense	0	0	1	0	0
# progressives	0	2	4.2	1	1
# prepositions	0	2	8.6	1	3
# adverbs	0	2	5.7	0	2
# conjunctions	0	0	1.1	0	1
# determiners	1	4	11.7	5	7
# pronouns	0	2	10.6	7	7
# retracings	0	1	0.8	0	4
# repetitions	0	3	0.6	1	0

* Utterance level errors are coded differently for control transcriptions.