Classification of Aphasia: WAB Type Versus Clinical Impression

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Classification regarding type of aphasia is an issue that has received mixed reviews. Brookshire (1983) recently commented that type of aphasia is probably the subject characteristic most likely to be influenced by the beliefs, biases, and opinions of the investigator. This applies to whether or not the investigator chooses to label the aphasic impairment and also to which classification system he or she employs. Opponents of classification argue that classifications are inadequate for capturing the complexity and severity of a given patient's language impairment. In contrast, supporters of classification regard it as an efficient method for describing symptoms that can be used to enhance communication among professionals. The nomenclature these investigators use reflects their orientation; be it clinical, physiological, psycholinguistic, or anatomical.

The pros and cons of classification and the proliferation of nomenclature often make clinicians and clinical researchers uncomfortable in classifying the language deficits of aphasic patients. To eliminate some of this uneasiness, many have relied upon formal test instruments to label aphasic impairment. One example is the Western Aphasia Battery (Kertesz, 1982). While this test offers a more reliable way to classify, it does not necessarily offer a more valid way to classify aphasic deficits. To our knowledge, this issue has not been addressed previously.

While investigating the natural course of language and cognitive recovery post-stroke, we followed a consecutive sample of 102 stroke patients subsequent to their admission to one of two local university hospitals. All patients were fluent speakers of English. None had any history of dementia or previous psychiatric disorder. Patients were observed within 24-72 hours post-stroke and visited daily throughout the course of their hospitalization. Daily observations, conducted by two trained speech and language pathologists, were designed to maximize areas of residual strengths, to probe areas of residual deficits, and to chronicle changes occurring as the spontaneous recovery period progressed. When the patient's physician declared him or her medically stable and ready for discharge, we administered the Western Aphasia Battery (WAB). The WAB provides for the computation of an Aphasia Quotient (AQ) which is derived from the verbal and auditory comprehension portions of the battery. These subtests include spontaneous speech (information content and fluency), comprehension, repetition, and naming. When subtest scores are added to scores obtained on the reading/writing, praxis, and construction subtests, a second measure, the Cortical Quotient (CQ) can be derived. This measure, according to Kertesz, is a more general measure of cortical functioning. Maximum score for both AQ and CQ is 100. Patients' subscores on fluency, comprehension, repetition, and naming permit classification of language impairment according to a taxonomic table (Table 1). To derive an aphasia type, one determines where a patient's scores fall within the ranges of each subtest criterion. For example, to arrive at a classification of Broca's Aphasia, the fluency rating must fall between 0 and 4, comprehension between 4 and 10, repetition must be less than 8, and the naming score must fall within 0 and 8. Aphasia classifications include Global, Broca's, Isolation, Transcortical Motor, Wernicke's, Transcortical Sensory, Conduction, and Anomic. In addition,

language is classified as Normal if an AQ of 93.8 or above is achieved. A WAB classification may therefore be assigned for all types of language performance.

Table 1. Taxonomic table of the Western Aphasia Battery (Kertesz, 1982).

	CRITERIA FOR CLASSIFICATION			
	FLUENCY	COMPREHENSION	REPETITION	NAMING
Global	0 - 4	0 - 3.9	0 - 4.9	0 - 6
Broca's	0 - 4	4 - 10	0 - 7.9	0 - 8
Isolation	0 - 4	0 - 3-9	5 - 10	0 - 6
Transcortical Motor	0 - 4	4 - 10	8 - 10	0 - 8
Wernicke's	5 - 10	0 - 6.9	0 - 7.9	0 - 9
Transcortical Sensory	5 - 10	0 - 6.9	8 - 10	0 - 9
Conduction	5 - 10	7 - 10	0 - 6.9	0 - 9
Anomic	5 - 10	7 - 10	7 - 10	0 - 9

All stroke patients were initially tested and typed according to the WAB when medically stable. In many cases, clinical impression of the patient's aphasia type was discordant with the type assigned by the WAB. To capture both agreement and discrepancy in aphasia classification, WAB type and clinical impression were recorded for all patients. Clinical impression was recorded by at least 2 trained WAB testers. "Impression" was the concordant agreement of the testers who used a set of definitions to classify aphasic impairment. The definitions were obtained from a variety of authors including Albert et al. (1981), Kent and Rosenbek (1978), Wertz (1978), Benson (1974), Kertesz and Poole (1974), Goodglass and Kaplan (1972) and others.

METHOD

WAB type and clinical impression were compared for 69 left hemisphere damaged stroke patients. Subjects' characteristics are presented in Table 2. Subjects consisted of 40 females and 29 males having a mean age of approximately 66 years (σ = 15.13 yrs). The majority of subjects were right handed and had thrombo-embolic strokes. They were administered the Western Aphasia Battery at an average of 17 days post stroke (σ = 9.3 days). Although the clinical impression of 17 patients included a coexisting motor speech impairment; i.e., dysarthria, apraxia of speech, or dysarthria and apraxia of speech, comparisons were made on the basis of the language impairment alone. For example, if a patient was clinically described to have both Anomic Aphasia and Dysarthria, this was considered in agreement with a WAB classification of Anomic Aphasia.

Table 2. Characteristics of the 69 left brain damaged subjects.

GENDER	TYPE OF STROKE	HANDEDNESS
40 Females	55 Thromboembolic	66 Right
29 Males	9 Hemorrhagic	3 Left
	4 Uncertain	
	1 Lacunar	

RESULTS

Clinical impression matched the aphasia classification by the WAB for 37 subjects, or 54% of the left hemisphere damaged stroke sample. Discrepancies in the aphasia classification of the remaining subjects occurred for both fluent and nonfluent classifications.

There was more agreement on nonfluent classifications. Figure 1 presents the number of times clinical impression agreed or disagreed with the WAB's nonfluent classifications. Three patients had Broca's Aphasia according to both the WAB and clinical impression. The WAB and clinical impression also concurred on the sample's single case of Isolation syndrome. Clinical impression agreed with eight of the WAB's classifications of Global Aphasia but disagreed with two other Global classifications. One of these patients was clinically described as having Wernicke's Aphasia and the other as having Transcortical Sensory Aphasia. The spoken output of both of these patients was considered to be too fluent for a classification of Global Aphasia. Clinical impression also failed to agree on the WAB's single classification of Transcortical Motor Aphasia. This patient was clinically typed as having Broca's Aphasia. Although her repetition was good, it was not considered to be disproportionately better than her overall spoken output.

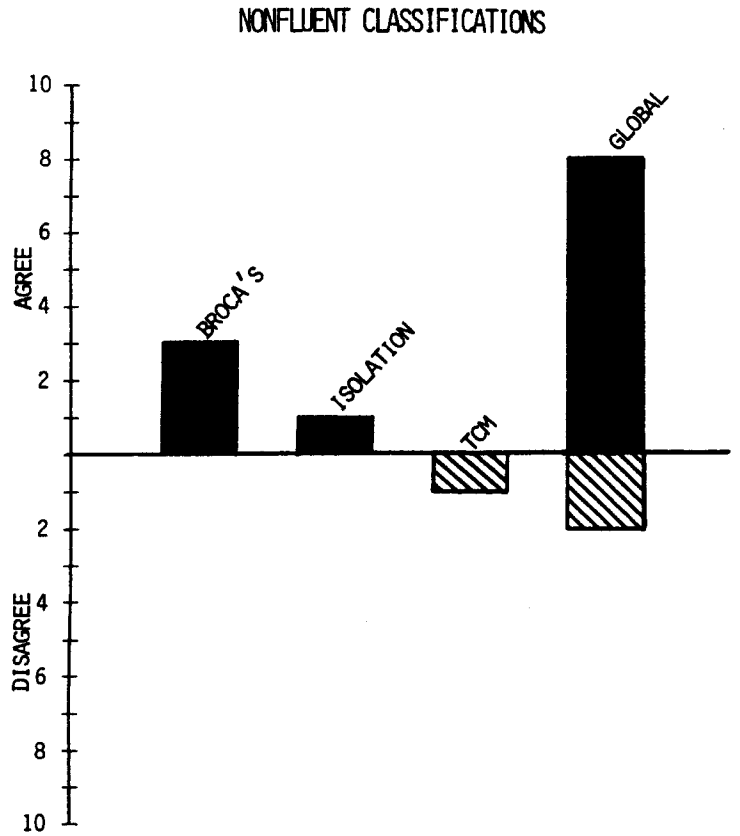

Figure 1. Agreement and disagreement between the WAB and clinical impression for nonfluent classifications.

More disparity between the WAB and clinical impression was found for the fluent classifications (Figure 2). The disparity for the WAB classification of Anomic Aphasia was particularily impressive. We disagreed with over half of the WAB's Anomic classifications. The language impairment of the majority of these subjects was not characterized by traditional aphasia types and was clinically described as Unclassifiable. A retrospective look at this group of subjects revealed them to have coexisting apraxia of speech, to be left handed and/or to have had a previous stroke. Interestingly, these characteristics render this group of subjects atypical of the larger left hemisphere damaged stroke sample. Four subjects were given a clinical description of Dementing Language. These subjects' language errors appeared to be associated with a more generalized decline in mental functioning. The language of two other subjects was clinically described as Normal. The paraphasic errors they produced on the repetition and naming subtests resulted from apraxia of speech. Because of their mildly depressed scores on these subtests, each was classified according to the WAB as having Anomic Aphasia.

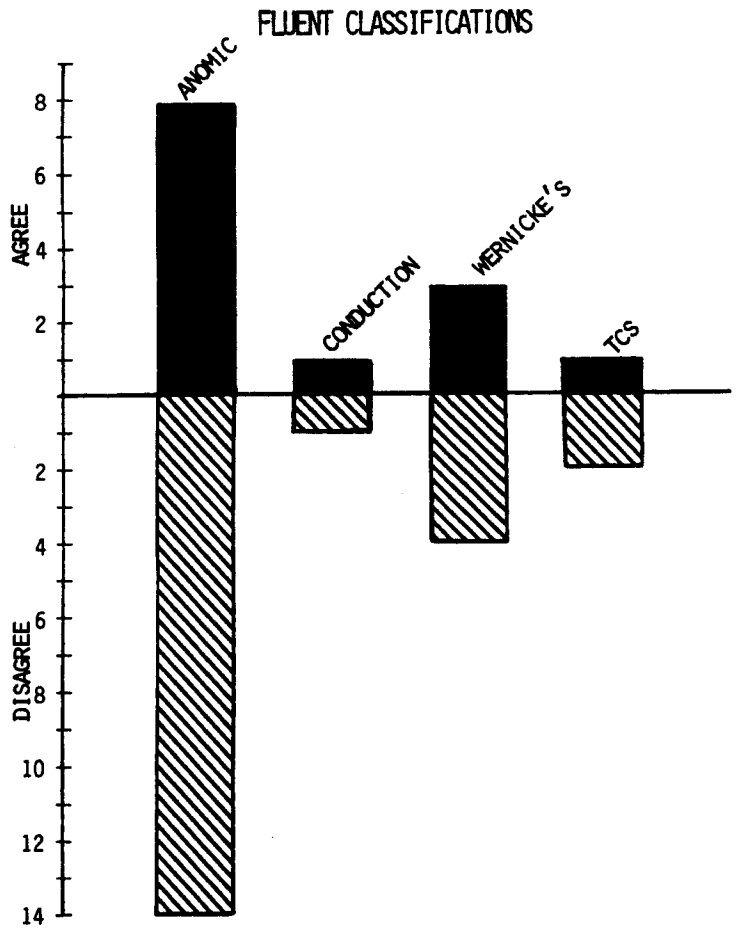

Figure 2. Agreement and disagreement between the WAB and clinical impression for fluent calssifications.

The final two subjects were classified as having Broca's Aphasia. We noticed that the WAB reserves the classification of Broca's Aphasia only for the more severe language impairments. Subjects with a mild Broca's Aphasia are classified by the WAB as having Anomic Aphasia.

To continue with fluent classifications, the WAB and clinical impression concurred on one classification of Conduction Aphasia and disagreed on one other. The subject in the latter case had been typed as having Conduction Aphasia early in the course of his hospitalization. By the time of formal testing, however, his language had evolved to a classification of Anomic Aphasia by clinical impression. Interestingly, when this subject was tested one month later, his language impairment had also evolved to a classification of Anomic Aphasia according to the WAB.

Agreement and disagreement were approximately equal on the classification of Wernicke's Aphasia. The language impairment of two subjects was clinically described as Conduction Aphasia. Again, both of these subjects had evolved during the course of their hospitalization from a clinical description of Wernicke's Aphasia to Conduction Aphasia. One subject refused follow-up testing. But the other, like the case previously described, evolved to a WAB classification of Conduction Aphasia when retested one month later. The remaining two disagreements were accounted for by one subject whose language impairment was deemed Unclassifiable and another who was described to have Dementing Language, in this case severe enough to interfere with auditory comprehension scores. Finally, clinical impression agreed with one of the WAB classifications of Transcortical Sensory Aphasia but disagreed on two others. One subject's language was described as Unclassifiable and the other's was described as Dementing.

An Aphasia Quotient of 93.8 or above represents Normal language. Clinical impression agreed with the majority of the WAB's classifications of Normal language (Figure 3). Disagreements were accounted for by two subjects who demonstrated word finding difficulties during spontaneous speech and whose language was clinically described as Anomic. There was one case of Dementing Language and one subject whose language impairment was Unclassifiable

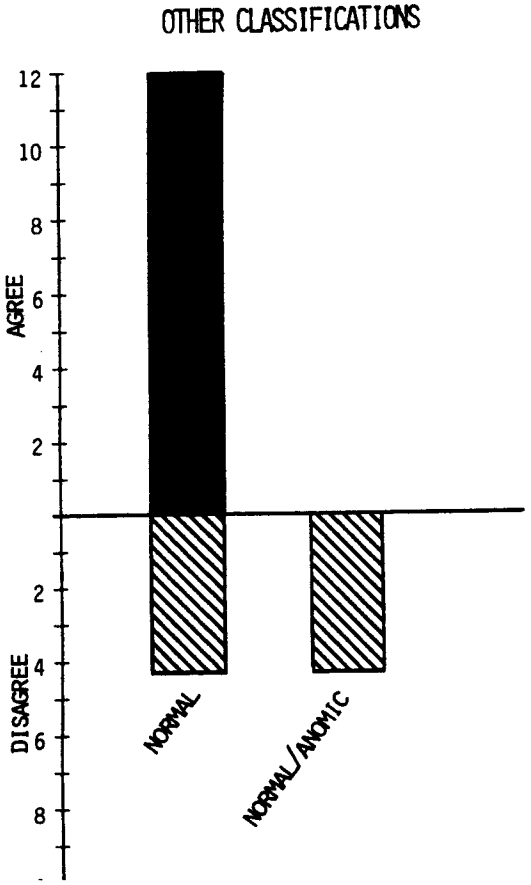

Figure 3. Agreement and disagreement between the WAB and clinical impression for other classifications.

Figure 3 illustrates another point of major discrepancy. Four subjects scored an Aphasia Quotient of 93.8 or above and achieved a naming score below 9.0. With all other subtest scores within normal limits, a naming score below 9.0 yields a WAB classification of Anomic Aphasia. The combination of the two therefore results in a classification of both Normal language and Anomic Aphasia. Clinical impression of all four subjects' language was recorded as Normal.

Given the longitudinal nature of our research, we continued to follow symptomatic patients until 1 year post onset. While this paper is intended only to discuss classifications at initial testing, we will briefly comment on one additional pattern of discrepancy in classification that emerged at subsequent testings. Kertesz states that the taxonomic table can be used to classify all aphasics unequivocally. Several of our left hemisphere damaged subjects, however, could not be classified according to the WAB. This resulted when subjects scored below normal limits on fluency, comprehension, or repetition but scored above 9.0 on the naming subtest. All these patients were clinically described to have Broca's Aphasia.

CONCLUSIONS

Various patterns of agreement and discrepancy were identified when aphasia classifications according to the WAB were compared with clinical impressions of aphasia type assigned by experienced WAB testers. Clinical impression matched the aphasia classifications of the WAB for 37 subjects, accounting for 54% of our left hemisphere damaged stroke sample. Clinical impression most often disagreed with WAB classifications of Broca's Aphasia and Anomic Aphasia; Broca's classification was considered too restrictive and the Anomic Aphasia classification was considered too general. Discrepancies also resulted when subjects achieved an Aphasia Quotient of 93.8 or above (Normal) but scored below 9.0 on the naming subtest (Anomic). Clinically, these subjects were classified to have Normal language. Disagreements also resulted when subjects were unable to be classified according to the WAB. These data suggest that the aphasia classifications of the WAB may be misleading. They strengthen the case for including a clinical description of patients' language impairments when using the classifications of the Western Aphasia Battery.

ACKNOWLEDGMENT

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REFERENCES

Albert, M.L., et al., Clinical Aspects of Dysphasia. New York: Springer-Verlag, 1981.

Benson, D.F., Aphasia, Alexia, and Agraphia. New York: Churchill Livingstone, 1979.

Brookshire, R.H., Subject description and generality of results in experiments with aphasic adults. Journal of Speech and Hearing Disorders, 48, 342-346, 1983.

Goodglass, H. and Kaplan, E., The Assessment of Aphasia and Related Disorders. Philadelphia: Lea and Febiger, 1972.

Kent, R.D. and Rosenbek, J.C., Acoustic patterns of apraxia of speech. Journal of Speech and Hearing Research, 26, 231-249, 1983.
Kertesz, A., Aphasia and Associated Disorders: Taxonomy, Localization, and Recovery. New York: Grune and Stratton, 1979.
Kertesz, A., Western Aphasia Battery. New York: Grune and Stratton, 1982.
Kertesz, A. and Poole, E., The aphasia quotient: The taxonomic approach to measurement of aphasic disability. Canadian Journal of Neurological Science, 1, 7-16, 1974.
Wertz, R.T., Neuropathologies of speech and language: An introduction to patient management. In D.F. Johns (Ed.), Clinical Management of Neurogenic Communicative Disorders. Boston: Little Brown and Company, 1-101, 1978.

DISCUSSION

Q: I am interested in why you chose this particular approach to test validity as opposed to comparing the WAB classifications with another measure that classified aphasic patients according to a taxonomy?

A: The approach is post-hoc, with data available from the larger study. Shortly after we began formal assessment of our stroke patients using the Western Aphasia Battery, we discovered that in many cases our clinical impression of patients' aphasia types were discordant with the types assign ed by the WAB. We decided to record our impression of each patient's aphasia type along with the classification provided by the WAB. While this approach was post-hoc, I think it is a very functional way to evaluate the validity of a classification taxonomy given the frequency with which clinicians and clinical researchers utilize clinical impressions of aphasia types.

Q: Do you think the clinicians' classifications were influenced by their training on the Western Aphasia Battery?

A: I do not think that training on the WAB influenced clinicians' classifications. Rather, I think that the clinicians' classifications were influenced by their daily contact with the patients. These visits afforded the clinicians the opportunity to become familiar with the patients and to gather a more representative sample of their language and cognitive abilities and deficits.

Q: Did you retest all of the patients?

A: We retested all patients who scored below the normal (93.8) cutoff on the Aphasia Quotient. Followup testing occurred at 2, 3, 6, and 12 months post-onset. We also continued to reevaluate patients whom we felt continued to have speech, language, or cognitive deficits regardless of their Aphasia Quotient.

Q: Did you have any better agreement with the WAB when you tested the patients at a later date?

A: Agreement did not improve at subsequent testing dates.