Panel: Aphasia With and Without Adjectives
Classifying the Aphasias: Commodious or Chimerical?

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The last time we got to Phoenix, Rosebek (1979), in his essay on wash and wear podiatry, asked, "Do you remember the manticore?, the beast with a man's head, a lion's body, and a dragon's tail?" (p. 163). Well, to continue his effort in bringing couth to the Clinical Aphasiology Conference, I ask you, remember the chimera? According to Homer, it had a lion's head, a goat's body, and a dragon's tail. It was born in Lycia and slain by Bellerophon. Bellerophon, the Joseph of Greek Mythology, was sent to Iobates, King of Lycia. Bellerophon was given many hazardous tasks, including the killing of the chimera. He succeeded in all of these. Later, Bellerophon attempted to fly to heaven on Pegausus, but Zeus sent a gadfly to sting the horse, and the rider was thrown. Today, the chimera is recognized for what it was, a creation of the imagination; an impossible and foolish fancy.

Now, do you remember the systems for classifying the aphasias? According to Goodglass and Kaplan (1972), these too have various parts--a Broca's, a Wernicke's, an anomic, a transcortical sensory, a transcortical motor, a conduction, and a global. Their system was born in Boston and slain by Darley and Schuell. Darley and Schuell, the Solomon and SoloMs. of aphasiology, were also given many hazardous tasks, including developing a prognostic classification for aphasia, classification of the dysarthrias, and defending the term apraxia of speech. Although both remained in Minnesota and neither were known for their equestrian skills, they accomplished all of these. This week, Darley flew to Phoenix, and Marshall sent Aten, Holland, and Ulatowska to see if he could be thrown. Today, we gather to see whether Darley remains in the saddle and to debate whether systems for classifying the aphasias are commodious or chimerical.

AN HISTORY, OF SORTS

Recently, Goodglass and Kaplan have received some support from Kertesz (1979), the Canadian neurologist known for his taxonomy of aphasia. Kertesz is fond of quoting Aristotle, who wrote, "...to define and divide one need not know the whole of existence." Others remember Aristotle for his theory of handedness. He explained that a child's handedness was determined by the mother holding her offspring in her nonpreferred hand, trapping one of the child's hands against her body, leaving the other free to develop and become preferred. This of course, would result in every generation developing handedness that is the opposite of the previous generation. Aristotle's wisdom speaks for itself.

But, I digress. The history of classifying the aphasias, as you know, has resulted in two points of view, the lumpers, who maintain aphasia is one (Marie, 1906), and the splitters, who maintain aphasia is many (Kertesz, 1979). Even though I am representing the former point of view, we must give the latter the serious consideration it deserves. Geschwind (1965) has devoted much of his career to developing a rational for classifying the aphasias, and hours are spent in the Boston Veterans Administration Medical Center Neurology Rounds pondering types of aphasia.

Certainly, the history of the debate whether to classify or not to classify is not without its minor inconsistencies. For example, Marie (1906) avoided being overly specific. His statement, "There is only one aphasia . . . anarthria

...anarthria with aphasia...temporal aphasia ...angular gyrus aphasia ... global aphasia," establishes that he was open minded and, perhaps, wishy washy. And, Goldstein (1948), a lumper, identified 30 types of aphasia, while Wernicke (1874), a splitter, identified only three. Further, Head's (1926) syntactic aphasia is the same as Wernicke's aphasia, while Wepman and Jones' (1961) syntactic aphasia is the same as Broca's aphasia. Thus, the history of aphasia classification suggests a need to prune, replant, or perhaps, pave.

More recently, Kertesz and McCabe (1977) have suggested that classification is not just "nice," it is, indeed, useful in patient management. Their effort indicates that type of aphasia may have prognostic value, that a patient's type of aphasia may change over time, that anomic aphasia is a common destination for patients migrating from other types, and that amount of recovery differs from final outcome. We, (Wertz, Kitselman, and Deal, 1981) attempted to see if these results could be confirmed. Specifically, we asked whether typing aphasia is useful in patient management.

A REPLICATION, OF SORTS

Study patients from the Veterans Administration Cooperative Study (Wertz, et. al., 1981) were classified, retrospectively, into each of three systems: fluent vs. nonfluent, the Western Aphasia Battery (WAB) (Kertesz, 1982) taxonomy, and the Boston Diagnostic Aphasia Examination (BDAE) (Goodglass and Kaplan, 1972) types. Our purpose was fourfold; to determine clinicians' reliability in classifying patients, to determine reliability among classification systems, to determine change in a patient's classification that may occur over time. Our patients had been evaluated at four weeks postonset and every 15 weeks thereafter up to 48 weeks postonset or until they dropped out of the study. Each patient received eight to ten hours of treatment each week he was in the study.

While we did not administer the WAB or the BDAE, our measures permitted us to classify patients in the three systems. Using measures of conversation, auditory comprehension, repetition, and naming, patients were placed in the eight WAB types--global, Broca's, isolation, transcortical motor, Wernicke's, transcortical sensory, conduction, and anomic. Using the same measures, patients were also placed into ten BDAE types---global, Broca's, isolation, transcortical motor, Wernicke's, transcortical sensory, conduction, anomic, mixed, and unclassifiable. Classification into fluent and nonfluent groups was based on the measure of conversation.

We looked at agreement in classification between two clinicians. Patients were divided into cohorts which represented the number of evaluations they received. For example, the four week cohort received one evaluation, the 15-week cohort received two evaluations, and so on. Measures of association varied among cohorts and among classification systems. As shown in Table 1, agreement on all evaluations ranged from a low of 63 percent on the BDAE to 90 percent on the WAB and 95 percent on the fluent vs. nonfluent dichotomy. While agreement was statistically significant ($p. < 0.05$) on all comparisons, our judges failed to agree on over a third of the patients when using the BDAE system and disagreed on ten percent of the patients when using the WAB system.

After a third judge was used to arbitrate disagreement and all patients were given final classification, we looked at the agreement among systems. As shown in Table 2, a measure of association indicated significant agreement ($p. < 0.05$) between the WAB and the BDAE on all comparisons. However, classification

in the two systems agreed for only 62 percent of the patients. Thus, 38 percent of our sample received one classification on the WAB and another classification on the BDAE.

Table 1. Measure of agreement (A*) and percent of agreement (%) between two judges for three classification systems.

EVALUATION	CLASSIFICATION SYSTEM					
	BDAE		WAB		FLUENCY	
	A	%	A	%	A	%
4 Week	.61	57	.84	84	.82	91
15 Week	.67	63	.88	88	.96	98
26 Week	.80	63	.92	93	.87	91
37 Week	.71	66	.94	97	1.00	100
48 Week	.81	71	.89	90	.92	97
All Evaluations	.56	63	.89	90	.88	95

*Cramer's V

Third, to estimate the prognostic contribution of classification, we calculated how much our 32 patients who were treated for 44 weeks improved. Four levels of improvement, ranging from "none," (zero percentile improvement on the Porch Index of Communicative Ability (PICA) Porch, 1967), to "marked," (improvement of 21 percentile units or more), were established. Table 3 shows that more nonfluent patients made marked improvement than fluent patients. The WAB classification (Table 3), indicated that global patients and the one isolation patient made more improvement than the other types, and transcortical sensory patients made less improvement than other types. The BDAE classification (Table 3), also indicated most global patients made marked improvement as did mixed patients and, what's this, transcortical sensory patients. Thus, we have evidence that classification systems are humane. Want to give the transcortical sensory patient a favorable prognosis? Classify him with the BDAE, not the WAB. Want to get more improvement out of your Broca's? Classify him with the WAB, not the BDAE.

Finally, we plotted the evolution on type of aphasia in our patients over time (Table 4). None of our fluent patients became nonfluent, however 56 percent of our nonfluent patients became fluent. Fifty percent or more of the patients in every WAB type except anomic changed their classification, at least once, during the first year postonset. Global, Broca's and isolation patients were the most fickle. Similarly, on the BDAE, only the conduction patient and most of the unclassifiable patients retained their original classification. Fifty percent or more of the patients representing other types of aphasia changed, at least once, during the first year postonset. One wonders whether the early classifiers who used type of aphasia to localize lesions were aware of how migratory a lesion might be.

Table 2. Measure of association and percent agreement between patients' classification on the BDAE and on the WAB.

EVALUATION	N	CRAMER'S V	% AGREEMENT
4 Week	57	.77	58
15 Week	57	.73	63
26 Week	48	.76	63
37 Week	39	.81	64
48 Week	32	.83	66
All Evaluations	233	.68	62

Certainly, our results can be criticized by attacking our measures. We did not give the BDAE nor the WAB. We used similar measures that sampled the same behaviors that are used to classify with the BDAE and the WAB. We did what speech pathologists and neurologists in Boston and London, Ontario do when they forget their packaged stimuli. We used fluency, auditory comprehension, repetition, and naming behavior to classify patients in both systems. Nevertheless, one wonders what we might have found had we actually administered the BDAE and the WAB. Here is a partial answer.

We (Wertz and Deal, Unpublished) have given both measures to 23 patients. As shown in Table 5, agreement in classification between the two measures was 26 percent. Six patients received the same classification on both measures, and 17 were classified differently. Of course, one must remember the geographic influence on aphasia classification. Every aphasic patient is classified in London, Ontario and only 40 to 60 percent are classified in Boston. Apparently, an explanation of the geographic influence on classification's accuracy will have to come from cartography, because the data have not been offered by aphasiology.

A DISCUSSION, OUT OF SORTS

Based on our (Wertz, Kitselman, and Deal, 1981) experience in typing the VA Cooperative Study patients retrospectively, we can arrive at a few conclusions. First, while clinician agreement was statistically significant ($p < 0.05$), they disagreed on how over one third of our patients should be classified on the BDAE. Similarly, while there was significant agreement ($p < 0.05$) between classification on the BDAE and the WAB, over one third of the patients were classified differently. When we actually administered the two tests, agreement between systems dropped to 26 percent. Certain types of aphasia appear to improve more than others, and certain types have a more favorable outcome. However, the former is not necessarily the latter. Global patients may make the most improvement, but anomic patients attain the highest level of language ability. Further, certain types appear to improve more in one classification system than they do in the other. Finally, change in type of aphasia is rampant. Over 50 percent of our sample changed their type of aphasia during the first year postonset.

Table 3. Improvement of PICA Overall percentile according to aphasia type.

GROUPS AT 4 WPO	N	IMPROVEMENT AT 48 WPO (% OF PATIENTS) None (0 %ile)	Mild (1-10 %ile)	Moderate (11-20 %ile)	Marked (21 + %ile)
FLUENCY CLASSIFICATION					
Fluent	15	0%	7%	40%	53%
Nonfluent	17	0%	6%	23%	71%
WAB CLASSIFICATION					
Global	5	0%	0%	20%	80%
Broca's	11	0%	9%	27%	64%
Isolation	1	0%	0%	0%	100%
Wernicke's	3	0%	0%	33%	67%
Transcortical Sensory	5	0%	20%	20%	60%
Conduction	1	0%	0%	100%	0%
Anomic	6	0%	0%	50%	50%
BDAE CLASSIFICATION					
Global	6	0%	0%	17%	83%
Broca's	5	0%	20%	40%	40%
Wernicke's	2	0%	0%	50%	50%
Transcortical Sensory	4	0%	0%	25%	75%
Conduction	1	0%	0%	100%	0%
Anomic	3	0%	0%	33%	67%
Mixed	7	0%	0%	14%	86%
Unclassified	4	0%	25%	50%	25%

Now, I am not suggesting one cannot classify the aphasias, but one must be very careful not to be misled. For example, we recently diagnosed a case of transvestite aphasia; however he turned out to be a case of dressing apraxia.

I do suggest that the application of aphasia classification to patient management is yet to be demonstrated. To be useful, classification systems must be reliable. Our experience indicates that agreement among clinicians is unacceptably low, and agreement among systems indicates greater similarity between Baskin Robbins and Hagen Das than between the BDAE and the WAB. The contribution which classification has to make to prognosis is not clear. One does not need to classify the aphasias to know that more severe patients, (the globally aphasic), have more room to improve than mild patients (the anomic), and that mild patients will end up mild and severe patients will end up severe. Finally, it is not amazing that patients change in both severity and symptoms. If, however, one believes that a set of symptoms is indicative of a specific type of aphasia and types of aphasia result from damage in specific areas of the brain, a change in type of aphasia implies a change in the location of the lesion. That is amazing.

Table 4. Change in classification between four weeks and 48 weeks post-onset.

TYPE AT 4 WPO	N	% OF PATIENTS	
		Unchanged	Changed
FLUENCY CLASSIFICATION			
Fluent	28	100%	0%
Nonfluent	29	44%	56%
WAB CLASSIFICATION			
Global	7	19%	81%
Broca's	16	25%	75%
Isolation	1	0%	100%
Wernicke's	10	40%	60%
Transcortical Sensory	9	44%	56%
Conduction	2	50%	50%
Anomic	11	73%	27%
BDAE CLASSIFICATION			
Global	8	50%	50%
Broca's	9	33%	67%
Transcortical Motor	2	0%	100%
Wernicke's	6	50%	50%
Transcortical Sensory	7	28%	72%
Conduction	1	100%	0%
Anomic	5	40%	60%
Mixed	10	30%	70%
Unclassified	7	71%	29%

Table 5. Comparison of 23 patients' classification who were evaluated with the BDAE and the WAB. Agreement between the two systems was 26%.

BDAE Type	WAB N	G	B	TM	W	TS	C	A	M	U	NA
Global	2	2									
Broca's	4		1							3	
T. Motor											
Wernicke's	1				1						
T. Sensory											
Conduction											
Anomic	4						2				2
Mixed	1		1								
Unclassifiable	11	2			1		6				2
Nonaphasic											

Certainly, we cannot prevent clinicians from labeling. We can ask, however, that those who insist on classifying the aphasias look closely for some useful application of this endeavor. I must conclude that classification of the aphasias, presently, is more chimerical than commodious.

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