

The Measurement of Interictal Speech and
Language Disturbances in Temporal Lobe Epilepsy

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In 1898, Jackson noted the occurrence of dysphasia during seizures originating in the left hemisphere.

Castells (1957) found deficits described as anarthria with or without loss of comprehension, word substitutions, jargon, and word finding problems, all of which were felt to constitute the epileptic crisis itself or one of its elements.

Serafetinides and Falconer (1963) differentiated between paroxysmal dysphasia and speech automatisms during seizures. They described paroxysmal dysphasia as an inability of the patient to express himself by the correct words, the impairment being expressive only or a combination of expressive and receptive. By definition, these brief incidents are always recalled by the patient. On the other hand, speech automatisms are defined as intelligible utterances at the time of a seizure for which the patient is subsequently amnesic. The authors categorize these automatisms by semantic content.

Tormakh (1970) refers to disturbances of speech at the time of seizures as either anarthria, characterized by slow labored speech, or aphasia, where the patient hears but cannot understand; he may respond with paraphasias or be unable to speak.

Laplane (1968) believes that in epileptic seizures disturbances of comprehension are not common, but expressive dysphasia is not infrequent.

All of the foregoing speech and language behaviors were observed as they occurred during ictal periods, i.e., at the time of seizures, and they were described rather than measured by standardized test procedures.

Patients themselves also report disruptions in communication which apparently occur interictally, i.e., between clinically manifested seizures. The following statements regarding two patients include some of their own descriptive words:

". . . he stated that he cannot talk or 'make sentences' for a few minutes post-ictally. At other times a word may be incorrect or 'garbled' or may be 'turned around.' He may not hear himself make these mistakes. Sometimes he knows what he wants to say but two or three of the words don't come out right. At other times, he may have ideas that he is unable to put into words . . ."

". . . Sometimes he tries to say a word but it 'doesn't come out right.' He puts a 'different letter' into it and then may need two or three attempts to correct it. He might suddenly say something 'stupid' or unrelated to the situation instead of what he is thinking. He may leave out a word when writing a letter and not notice it at the time. Sometimes he cannot recall a current conversation although he may remember it later. Sometimes

he hears but does not understand what is said and must ask for it to be repeated, although occasionally he can 'get it' after thinking for awhile . . ."

Glowinski (1973) has theorized that in temporal lobe epilepsy "there exists a frequent minimal electrical discharge which can produce interictal disturbances of sufficient magnitude to be detectable on psychological tests."

A number of studies have examined interictal performances of patients with temporal lobe epilepsy on psychological test batteries which sample cognitive behaviors such as intelligence, attention, and memory. There is no record of such a standardized comprehensive examination of speech and language abilities in patients having an epileptogenic temporal lobe focus even though such deficits have been validated in temporal lobe destructive lesions.

To determine whether a thorough investigation of the relationships between higher cortical functions including speech and language in temporal lobe epilepsy is warranted, a pilot study has been carried out during the last few months. Twelve patients, all suffering from temporal lobe epilepsy, were studied. Patients with TLE following head injuries, surgery, vascular accidents, and other known destructive organic lesions were excluded from the study. Also excluded were patients who demonstrated gross neurological deficits indicating wide-spread cortical or subcortical damage which might interfere with their speech and language patterns. All twelve patients were males with an age range of 31-64 years (mean age = 46.4 years). All were on various anticonvulsive medications. None of the patients had had any major seizures for a few months although some had experienced "small" seizures of the TLE type.

Each subject was informed that he was being examined in order to determine whether the speech and language difficulties he had reported could be identified by or correlated with his performance on a standardized speech and language test battery. A brief history, with emphasis on speech and language difficulties, was taken. Each subject was interviewed and tested individually during a single examination session. The test battery contained three tests: The Porch Index of Communicative Ability (Porch, 1967), Part V of the Token Test (DeRenzi and Vignolo, 1962), and the Word Fluency Test (Borkowski, et. al., 1967). The handout shows the mean scores obtained on the Porch Index of Communicative Ability (PICA) for three groups: normals in dotted lines, TLE in solid lines, and left hemisphere aphasic patients in the dashed lines. Scores in the graphic modality show the most spread, with the aphasic patients scoring lowest, and the TLE patients falling between the aphasic patients and the normal subjects. There is no appreciable difference among the verbal scores except that there is a tendency for TLE patients to score lower than the others on subtests I (telling the function of test objects) and IV (naming test objects). On the gestural subtests, both TLE and aphasic patients score lower than normals on subtests II and III (demonstrating the use of test objects). A surprising number of TLE patients verbalized along with their gestures, which resulted in numerous delays and incomplete responses on those two subtests. TLE patients were most apt to have delays at the beginning of subtests, which contributed more to lowering their scores than did paraphasic types of responses, although there were occasional examples of the latter errors. During their interviews, the TLE patients had demonstrated little evidence of impaired communication,

but when questioned, had often revealed experiencing periodic disruptions in communication such as were mentioned earlier.

For the TLE patients, error scores on Part V of the Token Test ranged from 0 to 5, with a mean error score of 2.6. The average percentile ranking was 42 and ranged from the 4th percentile to the 90th percentile.

Total scores on the Word Fluency Test ranged from 22 to 78; the mean score was 39.8 words. The mean percentile score was 22. Only two of the 12 subjects scored above the 28th percentile. Virtually all of them had several lapses of more than 10 seconds each during which they did not produce any words. Later many reported that they were "blank" but had been trying to think of more words.

Although none of the patients had clinical evidence of destructive lesions in the temporal lobe areas, abnormal patterns in certain interictal speech and language abilities occurred, as evidenced by the results of standardized tests, suggesting that these subtle changes are related to irritative lesions and abnormal discharges within the temporal lobes.

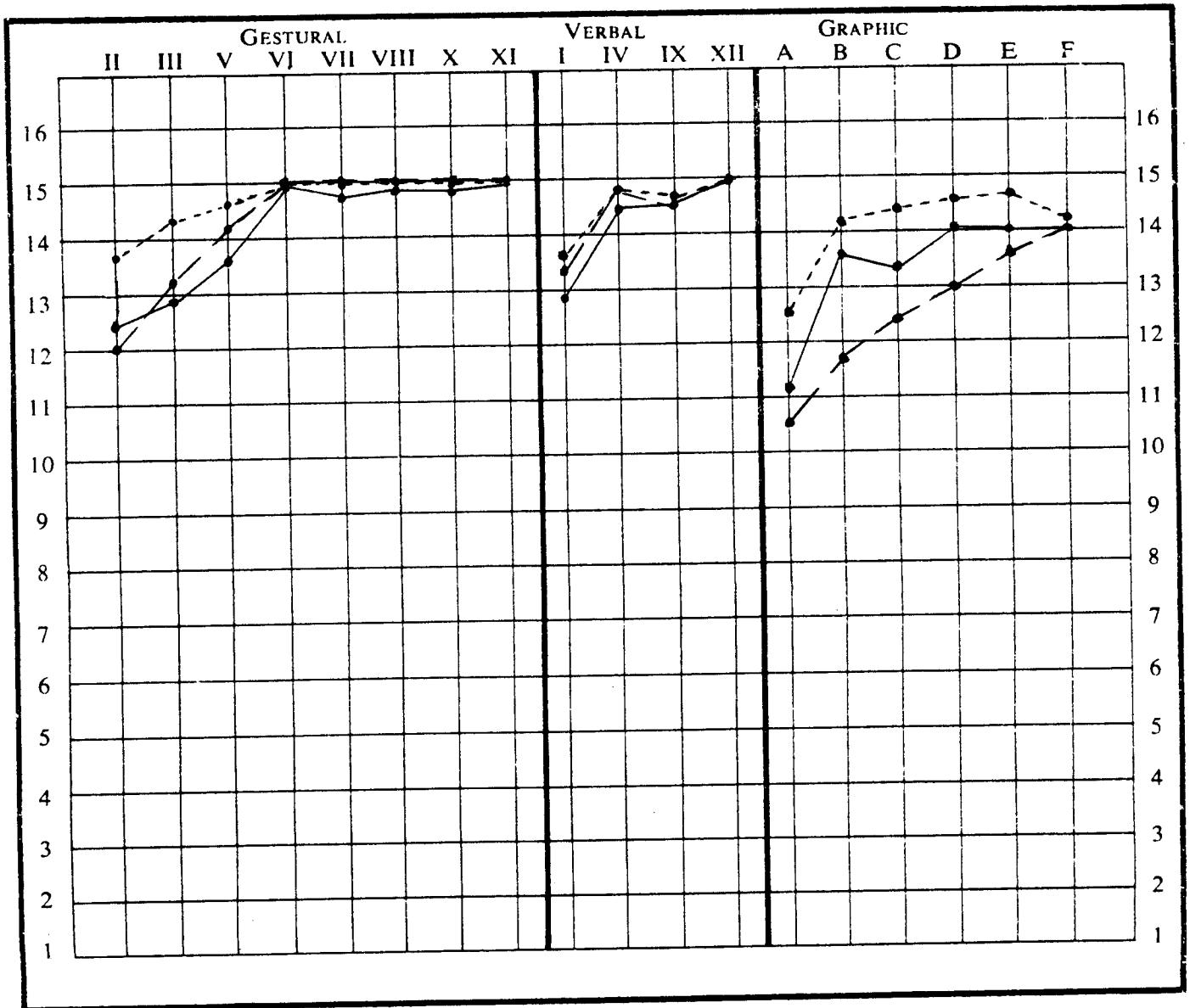
In order to explore further the value of standardized speech and language and other cognitive testing as diagnostic measures of TLE, a more extensive investigation has been proposed. Thirty subjects with clinical TLE and electroencephalographic evidence of spikes will be included: ten with spikes in the left temporal lobe, ten with spikes in the right, and ten with spikes in both temporal lobes. Ten to twenty normal subjects will also be tested. Some of the subjects will be tested both with and without seizure medication. Each subject will be given the speech and language test battery. Psychological tests such as the Weschler Adult Intelligence Scale (Weschler, 1955) will also be administered. Each subject will undergo an electroencephalographic study. In addition, a part of the speech and language test battery or specially designed tasks involving word production or auditory comprehension will be administered simultaneously with an EEG in order to correlate deficits in language processing with electroencephalographic findings.

Porch Index of Communicative Ability

MODALITY RESPONSE SUMMARY

Mean scores for 12 temporal lobe epilepsy patients compared to mean scores for normals and for aphasic patients with unilateral left hemisphere brain lesions

----- Normals	Overall 14.46	Gestural 14.66	Verbal 14.55	Graphic 14.12
———— TLE (92%ile)	Overall 13.97	Gestural 14.24	Verbal 14.31	Graphic 13.38
— — — L. hemis., 90%ile	Overall 13.77	Gestural 14.30	Verbal 14.45	Graphic 12.60



Note _____



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