Language Deficit in Aphasia and Dementia: The Same As, Different From, or Both

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In The White Hotel, D.M. Thomas (1981) has Sigmund Freud describe the speech of his patient, Frau Anna.

> Before, she had been miserable but sensible; now she was happy and demented. Her speech was full of imaginative products and hallucinations; at times it was not so much speech as Sprechgesang, practically an operatic recitative, elevated and lyrical-dramatic (Thomas, 1982, p. 131).

For Freud, the diagnosis was easy. Frau Anna was crazy. Had he been wearing his neurologist's hat, and had he consulted a speech pathologist, Frau Anna's verbal deficits may have received a more thorough analysis. For example,

> "...now she was happy and demented." Perhaps the language of generalized intellectual impairment?
> "...her speech was full of imaginative products and hallucinations;" Ahha! Perhaps the language of confusion?
> "...it was not so much speech as Sprechgesang," Had someone diagnosed her as aphasic and instituted a course of Melodic Intonation Therapy?

Whatever Frau Anna's linguistic deficits were, we do not know. However, her case illustrates a current dilemma. The terminology that different disciplines might use to label a language deficit transcends the ultimate term that is applied and influences what comes after diagnosis--the patient's prognosis and how the language problems may or may not be managed.

In this paper, I will condense the current dilemma and focus on two disorders, dementia and aphasia. I will be seeking an answer to two questions. First, are the language deficits seen in demented patients described best as aphasia? And, second, if they are not, can one differentiate the language deficits seen in dementia from those present in aphasia?

THE CURRENT CONTROVERSY

Some speech pathologists tend to be precise in the terms they use, and one of the most precise is Darley. In his recent book (Darley, 1982), he tells us what he believes aphasia is and what it is not. For Darley, aphasia is,

> Impairment, as a result of brain damage, of the capacity for interpretation and formulation of language symbols; multimodality loss or reduction in efficiency of the ability to decode and encode conventional meaningful linguistic elements (morphemes and larger syntactic units); disproportionate to impairment of other intellective functions; not attributable to dementia, confusion, sensory loss, or motor dysfunction; and manifested in reduced availability of vocabulary, reduced auditory retention span, and impaired efficiency in input and output channel selection (Darley, 1982, p. 42).

For Darley, dementia, which he describes as the language of generalized intellectual impairment, is,

> Deterioration of performance on more difficult language tasks; reduced efficiency in all modes; greater impairment evident in language tasks requiring better retention, closer attention, and powers of abstraction and generalization; degree of language impairment roughly proportionate to deterioration of other mental functions (Darley, 1969).

For Darley, therefore, aphasia is not dementia, and the language deficits seen in dementia are not aphasia.

Some agree. For example, Kitselman (1981) suggests "the primary difference between language impairment in aphasia and dementia is the degree to which the language impairment is isolated in the two disorders" (p. 209). In aphasia, language deficit is the primary problem, but in dementia, language deficit is embedded within a variety of behavioral deficits.

Nevertheless, many discuss aphasia in dementia. Ernst, Dalby, and Dalby (1970) reported "aphasic symptoms" in nine patients with presenile dementia. Watson and Heilman (1974) define dementia as a decline in the organism's ability to solve problems, but they note that aphasia may be seen in degenerative diseases such as Alzheimer's and Pick's. Hécaen and Albert (1978) report that aphasia may suddenly appear in a previously demented patient, or aphasia may precede the general intellectual impairment. Benson (1979) observes that the most common type of aphasia in dementia is anomia, but this relationship is not exclusive. Appell, Kertesz, and Fisman (1981) administered the Western Aphasia Battery (Kertesz, 1980) to a sample of Alzheimer's patients and concluded that all were aphasic. Horner and Heyman (1982) differentiate between focal aphasia and the language of patients with Alzheimer's disease, but they label the language deficits in the latter Alzheimer's aphasia.

So, the current controversy can be reduced to a conflict between those who believe that the language deficits in aphasia differ from those in dementia and those who label the language deficits in dementia aphasia. Representatives from both sides agree that the differential diagnosis of dementia and aphasia is not easy. Darley (1979) points out that we have not developed "a discriminating, economical test which can tell us with reliability into what diagnostic group a patient should fall" (p. 28). Benson (1979) agrees that differential diagnosis of patients with dementia and aphasia "may be subtle and mysterious" (p. 169). Nevertheless, some have tried. And, that is the second question I have posed. Can one differentiate the language deficits seen in dementia from those present in aphasia? Perhaps an answer to this question will provide an answer to the first question, are the language deficits in dementia described best as aphasia?

DIFFERENTIATING APHASIA FROM DEMENTIA

One way of differentiating among disorders is to use one's clinical experience. One may have learned, over the years, that certain behaviors are characteristic of certain disorders and that different behaviors typify others. For example, I have never seen an aphasic patient who brought me a urine sample to assist in his management. But a demented patient did.

Further, no aphasic patient has told me that, "As completely as possible, tell me what you do with these." was "The silliest God damned request" he had ever heard. But a demented patient has. (We thought he might be normal.) Or, one can draw from another discipline. Norma Rees has stated that her study of foreign languages helped her understand language disorders. I can agree, with certain modifications. My use of a crash course in Spanish for Medical Workers with a Hispanic patient suspected of being demented assisted in diagnosis. His respone to my request, "Abra su lengua," reminded me there is a difference between "lengua"--tongue, and "boca"--mouth, and try as one might, even if demented, one cannot "open your tongue."

Typically, however, our history of differentiating aphasia from dementia has involved the use of language tests. We have administered measures to samples of patients drawn from each disorder and compared performance. Halpern, Darley, and Brown (1973) did this. While they compared four disorders, we are interested only in the differences between aphasia and the language of generalized intellectual impairment. They observed that the pattern of deficits on different language tasks may differentiate between the two disorders. What was easy for demented patients may be difficult for aphasic patients. For example, aphasic patients found auditory retention tasks difficult, and they made a large number of fluency errors. Conversely, demented patients had less difficulty with auditory retention tasks and made few fluency errors. Thus, the patient's profile on the various language tasks should classify him as aphasic or demented.

However, we (Deal, Wertz, and Spring, 1981) questioned this approach. For example, Halpern et al. (1973) did not specify whether their patients were diagnosed solely on the basis of language performance or whether the patients' history and neurologic data were used to make the original diagnosis. Further, no statistical tests were used to demonstrate that the profiles for different disorders did, in fact, differ. We attempted a cross-validation of their results for two groups of patients--aphasic and demented--who had been diagnosed independent of their performance on the Halpern et al. measures.

Twenty-one aphasic patients and 15 demented patients were studied. The demented patients were older, but the groups did not differ significantly in time postonset. Most of the aphasic patients experienced a change in handedness postonset. Few of the demented patients did. All aphasic patients suffered lesions confined to the left hemisphere. Most demented patients showed bilateral lesions. All aphasic patients displayed focal lesions. Most demented patients displayed diffuse or disseminated lesions. An infarct was the most common etiology in the aphasic group, but the demented patients spread across three etiologic categories--infarct, degeneration, and mixed.

Aphasic patients made more errors on all of the Halpern et al. language measures than the demented patients. All differences except reading comprehension, written dictation, and arithmetic were significant ($p < .05$).

To test the power of the Halpern et al. profiles to differentiate aphasia from dementia, we computed Q-correlations for all subjects. The Q-correlation is an index of similarity between profiles. In this case, a patient's profile on the language tests was correlated with the Halpern et al. profiles for aphasia and for dementia. The magnitude of the correlation with one profile or the other should classify the patient as aphasic or

demented. Seventeen of the aphasic patients were classified as aphasic. Four were classified as demented. Seven of the demented patients were classified as aphasic, and eight were classified as demented. Thus, the Q-correlations tended to pick out the aphasic patients, but not the demented patients.

Rochford (1971) has used a more economical approach for differentiating between aphasia and dementia. Almost everyone agrees that both aphasic and demented patients make naming errors. Rochford analyzed these. His results are summarized in Table 1. He found that aphasic naming errors were of three types--inability to name, but correct recognition of the stimulus indicated by giving the appropriate function; rejection of the stimulus, "I don't know."; and no response. Over half of the demented naming errors, however, resulted from an incorrect recognition of the stimulus, for example, calling an "anchor" a "hammer." In a subsequent investigation that compared object naming with naming body parts--the latter, Rochford believed, would be less influenced by visual misrecognition--he found that aphasic patients made essentially the same total errors on both tasks, but that demented patients made 50 percent fewer errors in naming body parts than they did in naming objects. He concluded that naming deficits in aphasia represented language impairment, but naming deficits in dementia may result from impaired recognition and may not reflect impairment of language.

Table 1. Comparison of naming errors in aphasic and demented patients. (After Rochford, 1971.)

GROUPS	% OF TOTAL ERRORS			
	Correct Recognition	Misrecognition	Don't Know	No Response
Aphasia	36	5	33	26
Dementia	8	55	26	11

Horner and Heyman (1982) studied language performance in patients with Alzheimer's disease and compared their results with what we know about language performance in patients who suffer aphasia from a focal lesion. They point out that most aphasic naming errors are semantic and most demented naming errors are visual. Writing errors in aphasia tend to be misspellings characterized by letter substitutions and sequencing errors, and errors increase as words increase in length. Demented writing errors are also characterized by misspellings, but the errors are often phonetically related, and addition of letters is frequent. Aphasic patients copy better than they write spontaneously, but the reverse is seen in dementia. Aphasic patients show deficits in all areas--phonology, syntax, and semantics. Demented deficits depend on severity--semantic errors occur first followed by syntax errors and then phonologic errors. Regardless of severity, aphasic patients can be classified into fluent or nonfluent types. Only severely demented patients can be classified as fluent or nonfluent. Aphasic patients may not be able to perform, but they indicate that they know what has been

requested. Their ideas are logical, temporal sequence is preserved, and responses are relevant. Conversely, demented patients show poor logical and temporal sequence of ideas. Their speech may be redundant and composed of repetitive ideas and self-referrential statements.

Another approach to differentiating aphasia from dementia is to give demented patients a test for aphasia and see if they do what aphasic patients do. Appel et al. (1981) administered the Western Aphasia Battery (WAB) to patients suffering Alzheimer's disease. Their results led them to conclude the demented patients were, indeed, aphasic. A comparison, shown in Table 2, with what aphasic patients are known to do on the WAB indicated that the demented sample was more fluent but had poorer auditory comprehension. When Appel et al. applied the WAB taxonomy, 88 percent of the demented sample were classified as either global, Wernicke's, transcortical sensory, or anomic. None was classified as Broca's or transcortical motor. Unfortunately, the authors did not report data for aphasic patients on reading, writing, praxis, and construction tasks. Except for praxis, the demented group scored lower on these tasks than they did on the measures used to determine the presence of and to classify aphasia. While a comparison of aphasic patients and demented patients on reading, writing, and construction tasks may not refute the authors' contention that all demented patients were "without exception" aphasic to some degree, such a comparison may be useful in differentiating aphasia from dementia.

Table 2. Comparison of mean performance by aphasic and demented patients on the Western Aphasia Battery. (After Appell et al., 1981.)

Measure	Aphasia	Dementia
Fluency	5.4	6.8
Information	4.8	4.3
Comprehension	6.2	4.6
Repetition	5.8	5.7
Naming	4.5	3.6
Aphasia Quotient	53.5	50.1
Reading	Not Reported	3.1
Writing	Not Reported	2.3
Praxis	Not Reported	4.2
Construction	Not Reported	2.1

Finally, Watson and Records (1978) also compared performance between aphasic patients and demented patients on a test for aphasia, the Porch Index of Communicative Ability (PICA) (Porch, 1973). Figure 1 shows that the aphasic group was more severe (approximately the 35th percentile overall) than the demented group (approximately the 60th percentile overall). Watson and Records observed that a comparison of subtests composed primarily of auditory stimuli with those composed primarily of visual stimuli differentiated between the two groups. For example, demented patients generally had more difficulty on visual tasks--subtests VIII, XI, E, and F--than on auditory tasks--subtest VI, X, C, and D. And, generally, the reverse was true for aphasic patients--more difficulty on auditory subtests than on visual subtests. They concluded that the PICA "may be beneficial in detecting the fine differences in brain damage" (p. 101).

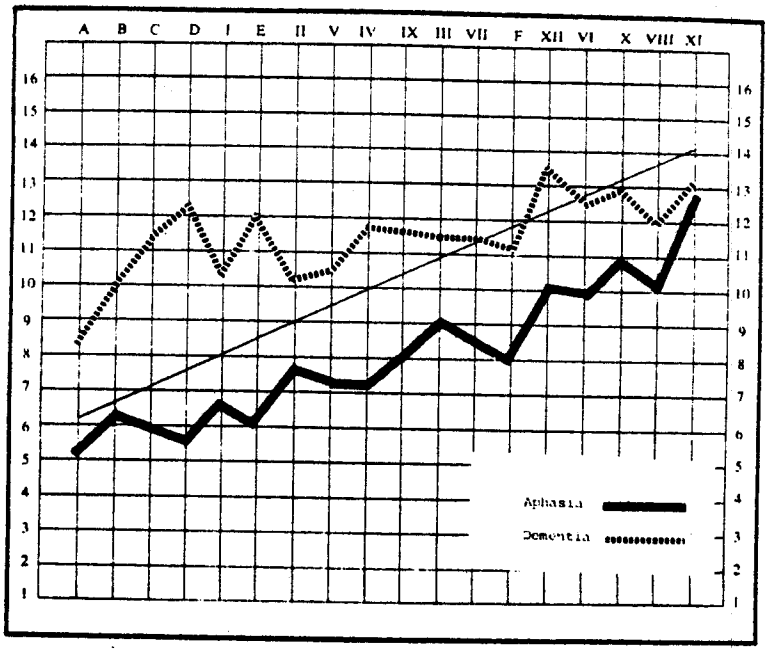

Figure 1. Comparison of aphasic and demented mean performance on the PICA Ranked Response Summary. (After Watson and Records, 1978.)

Watson and Records (1978) experienced the same problem that most comparisons of aphasic patients with demented patients have experienced. Their aphasic sample displayed more severe language deficits than their demented sample. However, because they administered the PICA, one can manipulate their data and equate severity. I have. Their demented sample performed at the 60th percentile overall on the PICA. Porch (1973) has provided 60th percentile performance for aphasic patients in his normative sample. I asked, would the differences between aphasic and demented patients be washed out if the two were equated for severity? Figure 2 shows that they are not. When one compares Watson and Records' demented sample with 60th percentile aphasic performance, differences between the two disorders remain. Demented patients do better than aphasic patients on more difficult writing tasks--subtests A, B, and C; worse on reading tasks--subtests V and VII; worse on verbal tasks requiring naming, sentence completion, and repetition--subtests IV, IX, and XII; worse on auditory tasks--subtests VI and X; and worse on visual tasks, subtests VIII and XI.

An additional comparison is possible. Porch, Friden, and Porec (1976), in a study that differentiated aphasic performance on the PICA from that of non-brain-injured persons, have provided discriminant function weights to distinguish among patterns of PICA performance. Subtest percentile performance can be plotted on the PICA Ranked Response Summary, and patterns of performance can be compared. If one compares 60th percentile aphasic performance with performance by Watson and Records' demented sample, as shown in Figure 3, the patterns differ. The aphasic profile resembles the PICA's definition of aphasia, a negative function curve where performance is worse on more difficult subtests and better on easier subtests. The demented

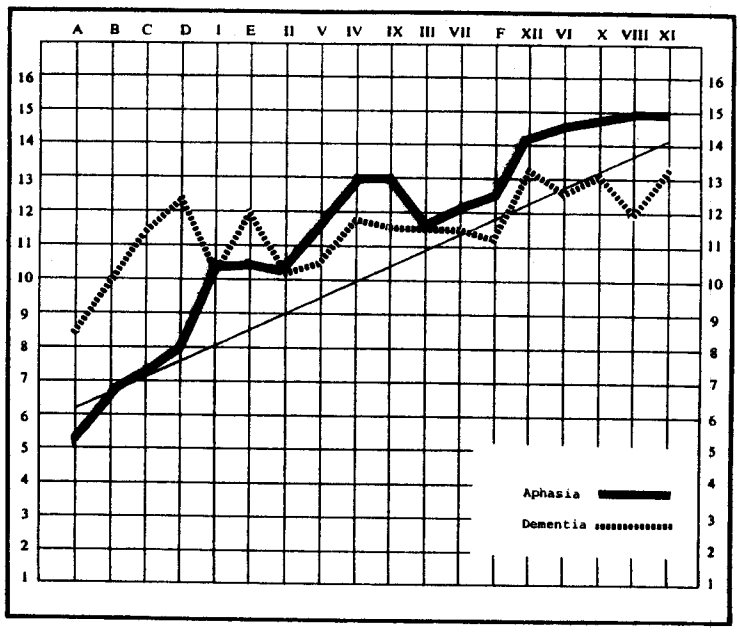

Figure 2. Comparison of PICA 60th percentile performance by demented patients with 60th percentile performance by aphasic patients. (After Watson and Records, 1978.)

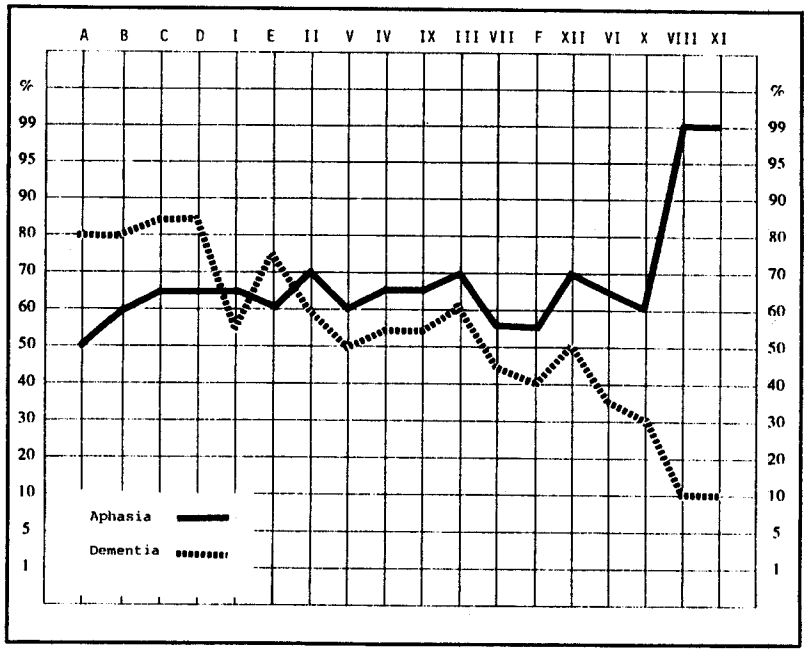

Figure 3. Comparison of PICA subtest percentile performance by demented patients and aphasic patients. (After Watson and Records, 1978.)

patients' profile is almost the reverse, better on more difficult subtests for aphasic patients and worse on easier subtests for aphasic patients.

Discriminant function analysis requires multiplying subtest percentile performance by the appropriate weight provided by Porch et al. (1976). The results are added to obtain a discriminant score that classifies performance as aphasic, nonaphasic, or aphasia undetermined. Scores larger than -.211 represent aphasia, scores less than -.279 are considered nonaphasic, and scores between the two values are unclassifiable. My calculations for Watson and Records' demented sample yield a score of -.612, clearly nonaphasic.

DISCUSSION

Returning to the two questions posed earlier, I will discuss the second first. Can one differentiate the language deficits seen in dementia from those present in aphasia? The evidence supports an affirmative answer; however, the data are not consistent. The Halpern et al. (1973) profiles appear to differentiate, but our (Deal, Wertz, and Spring, 1981) use of Q-correlations missed 19 percent of our aphasic patients and 47 percent of the demented patients. But, if language performance was coupled with neurologic data, all patients in both of our groups would have been classified correctly. Rochford's (1971) detailed analysis of naming errors also appears useful in differentiating aphasia from dementia. Similarly, if one performs Horner and Heyman's (1982) detailed analysis on a variety of language tasks, differences between language deficits in dementia and aphasia begin to emerge.

The Appell et al. (1981) results and those of Watson and Records (1978) conflict. Both administered a test of aphasia to demented patients. Appell et al.'s demented patients were classified as aphasic, Watson and Records' demented patients were not. Certainly, the two aphasia tests differ. One of Kertesz's (1980) primary purposes in developing the Western Aphasia Battery was to classify aphasic patients who were not classifiable on other aphasia tests, for example, the Boston Diagnostic Aphasia Examination (Goodglass and Kaplan, 1972). His discrete cut-off scores seem to have achieved that purpose. On the other hand, the system may classify patients as aphasic when they are not. Poor performance on a language test does not necessarily make one aphasic. If it did, many deaf, blind, mentally retarded, comatose individuals, animals, and, perhaps small appliances should be considered aphasic. Conversely, one of Porch's (1973) primary purposes in developing the PICA was to differentiate aphasia from other disorders, including bilaterally brain-injured patients, dysarthric patients, illiterate patients, and malingerers. Watson and Records' results indicate that purpose has been achieved. Their demented patients cannot be classified as aphasic on the PICA.

So, we can conclude that Darley (1979) is correct. We have not developed a discriminating, economical test which can tell us with reliability into what diagnostic group a patient should fall. However, by administering a variety of measures, probing the results, and utilizing a patient's history and neurologic data, we can differentiate aphasia from dementia.

Now, are the language deficits seen in dementia described best as aphasia? While the language behaviors may be similar, they are far from identical. Sarno (1976) considers that one of our current problems in the

study and management of aphasia resides in how we use the nomenclature and terminology. She points out the considerable confusion and ambiguity that exists and suggests that the boundaries are in need of clear deliniation so that patients with dementia are not classified as aphasic. I agree. To call a demented patient aphasic based on his performance on a test for aphasia is no more useful or correct than to call an aphasic patient demented based on his performance on a test of intelligence. This is not to deny the presence of language deficits in dementia. It is to place those deficits in an appropriate perspective for proper management.

The task for the aphasiologist is not to be misled. Our labels--aphasia, dementia--imply more than just a diagnosis. They also imply prognosis and management. The aphasic patient's future and his management differ from the demented patient's future and management.

In the study of aphasia and dementia, we have followed Lewis Thomas' (1980) map that guides how science gets most of its information. We have plodded the path of reductionism. We have explored the details and the details of the details. The smallest bits have been laid out, counted, and scrutinized. The differences between the two disorders sum to more than the similarities. While we continue to probe, and we should, we must heed Thomas' caution in labelling today's patient. Our endless, obsessive preoccupation with the parts may tempt us to overlook the whole. Because the language, the prognosis, and the appropriate management for aphasia and dementia differ, I do not believe that talking about aphasia in dementia is very useful.

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