Evolution of the deficit in total aphasia

J. P. Mohr, M.D., M. Sidman, Ph.D., L. T. Stoddard, Ph.D.,
J. Leicester, M.D. and P. B. Rosenberger, M.D.

Total or global aphasia, although long recognized as a major aphasic syndrome,[1-6] has proved difficult to study quantitatively because the behavioral syndrome does not restrict itself to a single response form, sensory modality, or class of stimulus materials. The extent of the deficit across all these major variables gives the syndrome its name and is usually taken as its major characteristic.

In the present report individual parameters of the deficit in three cases of total aphasia were studied by means of a special test methodology.[7] The tests used three types of responses—oral naming, written naming, and matching-to-sample; three types of sensory input—vision, hearing and touch (palpation); and several types of conventional stimulus materials—letters, words, numbers, pictures, colors and objects. Basic to the analysis is the examination of various stimulus inputs associated with the same response and, conversely, of constant inputs associated with different responses. Combining these two methods makes it possible to analyze total aphasia into its components of input deficit, output deficit, and relational deficit. Relational deficit involves impaired stimulus-response relations when input and output channels are individually intact. Relational performances, when properly characterized as a set of interlocking stimulus-stimulus and stimulus-response equivalences, constitute at least one aspect of language behavior.[8]

Total aphasia entails at least three major elements. The first is a double deficit in tasks of oral naming, involving both output and relational components. Second, oral and written naming on relational tasks show a degree of independence from one another that has not been emphasized in accounts of total aphasia. Finally, evidence is presented that the relational defects observed are more severe with letters than with words.

Methods

Patients A.J.G. and R.W. were evaluated in a behavior laboratory. They were seated before a display panel embedded at eye level in the wall of a small, quiet, softly lit room. The panel had nine translucent windows, each 2 in. square, arranged in a 3 by 3 matrix. The patients underwent tests of matching-to-sample, oral naming, and written naming of visual, auditory or somesthetic (palpated) stimuli. The stimuli were presented in the form of single letters, three letter trigrams (i.e., p-f-x), pictures, picture names, colors, color names, digits, digit names, dot clusters, and manipulatable objects (i.e., coins).

In matching-to-sample tests, each trial began by presenting the test stimulus (sample): Visual stimuli were projected onto the center window of the matrix, auditory stimuli were dictated from a prerecorded tape through an

From the Behavior Laboratory, Neurology Service, Massachusetts General Hospital, Boston.

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Dr. Mohr's address is Department of Neurology, Massachusetts General Hospital, Boston 02114.

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endless loop tape player and presented repetitively through a loudspeaker mounted in the ceiling of the chamber,[9] and somesthetic test stimuli were presented to the left hand only on a shelf shielded from view mounted directly below the matrix. Letter and digit stimuli used in somesthetic tests were raised plastic forms 2 in. high.

The patient responded to the stimulus by pressing the center window of the matrix. When he did so, visual comparison stimuli were projected onto the eight outer windows of the matrix. The patient indicated his selection by pressing that comparison stimulus window. Correct selections were rewarded by chimes ringing and delivery of a nickel through a chute next to the matrix. After each trial, regardless of correct or incorrect selection, the next trial followed immediately.

The test stimuli were presented in the same way for oral naming. Chimes and nickel reinforcement, or no reinforcement, occurred as in matching. The subject had simply to say aloud the names of the stimuli.

For written naming, stimulus presentation and reinforcement conditions were the same. The patient was required to write or print his response for each trial on a clean blank sheet of 8 by 10 in. paper. A fresh sheet was provided for each trial.

Patient F.F. was tested in a clinic examining room. The visual stimuli were presented on 3 by 5 in. cards, ruled into nine 1-in. squares to form a miniature display like the matrix used in the test chamber. Auditory stimuli were spoken aloud by the examiner and reinforcement consisted of the examiner saying, "Good." In all other respects the conditions were the same as for the other patients.

Most of the tests contained 20 trials, some 18. The number of tests per session varied. The initial and final tests of a given session were usually determined by previous satisfactory performances to insure control for adequate instruction in the task and control for fatigue, boredom, discomfort, satiation, etc. The sequence in which the tasks were presented to the patient and the time between sessions varied over the study without evident influence on the results. The materials were selected to represent those used traditionally in the testing of aphasia, and the tests were well within the abilities of average grammar school children. The stimuli were presented in their usual forms: typescript letters, arabic digits, ordinary colors, line-drawing pictures, and manipulatable objects.

The methodology is discussed more fully elsewhere.[7]

Case reports

Case 1. A.J.G., an active minor union official, was hospitalized August 12, 1967, after the sudden occurrence of total aphasia, right hemiplegia, hemianesthesia and hemianopia while he was chatting in his back yard with a neighbor. He had a known tendency for cardiac arrhythmias dating from childhood, varying from atrial flutter through atrial fibrillation to complete heart block. He had been treated with digitalis.

On admission, he was alert but was mute and unresponsive to dictated commands, and he showed conjugate ocular deviation to the left with dense right hemiplegia, hemianesthesia and hemianopia to threat. A single grand mal seizure occurred. Normal laboratory values were recorded for hematocrit, white blood cell count, blood smear, urinalysis, prothrombin time, electrolytes, urea, calcium and phosphorus, lupus erythematosus preparation, serum protein, and erythrocyte sedimentation rate. A lumbar puncture was interpreted as a traumatic tap; protein and sugar were normal. A skull x-ray was normal. A chest x-ray showed biventricular enlargement. An electrocardiogram (ECG) showed third degree atrioventricular block with nodal escape but no change from a previous tracing.

On the second day of hospitalization, he lay in bed with a motionless right side. He could cooperate in examination only when approached from the left side. He then reached out to shake the examiner's hand in greeting and could mimic the examiner in opening his mouth, waving his left hand, and raising his left leg. He turned his head to spoken words but did not obey commands to perform movements he had previously mimicked. There was no change in his response when the examiner changed his voice or manner by shouting, pleading, smiling, or appearing angry.

On the third and fourth hospital days the patient could be trained to raise his arm to the dictated command, "Raise arm," and also to "Let's go to the bank," if the examiner paired the dictated command with mimicry. The effects of the isolated command lasted for only a few trials and had to be reestablished by the re-pairing of the command with the movement. The response could not be trained to a cough or clearing of the throat.

On hospital day nine, when presented with a series of men's names, the patient nodded only to his own. He also nodded to all sets of words intoned in the form of a question, including German words and pig latin.

On hospital day 22, he was observed smiling and nodding to conversation made by his visitors. His nodding continued when they turned to question a nurse in the hall. Later, when alone, he was shown a large card with eight single-letter choices arranged in matrix form and asked to point to the "A." He smiled and nodded. He failed to learn to point to "A" after five trials in which his left hand was placed on the "A" and the command repeated aloud. He also failed to point correctly to colors, pictures of animate objects (i.e., cow, dog), or ellipses, although he did reliably point, apparently at random, to choice stimuli on the cards.

On day 25, he was first taken to the behavior laboratory. He was followed for over two years as an outpatient. His general status slowly improved. Within months he was able to walk slowly with a cane. The right side of the face remained weak, the right arm became stiffly flexed at the elbow, and the right leg was stiffly extended, serving as a prop in walking. The hemianopia cleared within weeks. The hemisensory syndrome was much less evident after several months. He continues living at home, tended by his wife. He bathes, dresses, feeds and amuses himself with television and some simpler card games and helps in household chores. His spontaneous speech is limited to a few words. He nods and appears to understand simple sentences but is easily tricked by complex word order, multisyllabic words, double negatives, and multistep commands. He remains totally disabled with respect to his previous occupation.

Case 2. R.W., a 14 year old boy, was hospitalized May 15, 1964 because of a sudden onset of total aphasia, right hemiplegia, hemianesthesia and hemianopia, shortly after he had finished a foot race. A left common carotid arteriogram obtained six hours after the onset of his deficit showed complete occlusion of the left middle cerebral artery just distal to the point of departure of the main temporal branch.[10] This patent branch appeared to supply the temporal pole and part of the middle temporal gyrus. A right common carotid arteriogram was normal. His three week hospital course was uneventful except for a transient period of cerebral edema.

Over a year after discharge, he regained the use of his right leg as a spastic prop in walking. The right side of the face and the right arm remain densely paretic seven years later. The hemianesthesia and hemianopia disappeared within a few months. He was unable to speak and could only sigh or grunt occasionally. He proved able to point to pictures on dictated command and obeyed a few simple motor commands.

In the years following his hospitalization, he gradually appeared to understand most spoken speech, participating in conversation by nodding or by printing a few short word responses. In 1968 he began to repeat short sounds from dictation. By 1970 he was able to speak spontaneously, although in a halting manner, in single words and short two and three word sentences.

Case 3. F.F., a hypertensive 47 year old truck driver, was hospitalized in November 1966 after several weeks of recurrent bifrontal headaches, at the end of which he awoke with a weak right arm and leg. On admission, he showed a trace of right central facial weakness, moderate weakness of the right arm, and more severe weakness of the right leg. He was unable to stand. There was no aphasia. A lumbar puncture showed normal values, and the rest of the examination was unremarkable. Recovery was complete within two months.

In August 1967, he was admitted to another hospital after he had awakened unable to speak aloud and with a weak right face and arm. On examination, blood pressure was 220/130. The right lower face and right arm were moderate to severely paretic. The right leg was barely involved. The plantar response was flexor bilaterally. He was mute, receptive aphasia was evident, and EEG showed left frontotemporal high-voltage delta activity with well preserved background activity elsewhere.

In August 1968 and in May 1970, he was tested in the speech therapy unit at the University of Maryland Hospital Stroke Clinic. On the Minnesota Test for Differential Diagnosis of Aphasia, he showed moderate to severe impairment in all language modalities. Examinations showed continuation of a dense right central facial weakness, flexion spasticity of the right upper extremity, and a walk characterized by a slightly circumducted gait.

The data reported here were obtained by the senior author from July to September 1970, on weekly trips made from Walter Reed Army Institute of Research to the University of Maryland Medical Center during part of his period of military service.

Results

"Identity" versus "nonidentity" performances. The three panels on the left side of figure 1 show the time course in weeks of patient A.J.G.'s scores on tests that required him to match visual, auditory and tactile upper and lower case test letters to lower case visual-letter comparison stimuli (bottom panel); to name the test letters orally (center panel); and to write (or print) the test letters (top panel) either as physically identical lower case letters or lower case letter responses to upper case letter stimuli.

During the early tests, the only satisfactory performances were matching and writing in response to visual and tactile sample letters. Matching and writing of dictated letters remained deficient throughout the 85 weeks of testing. Tests of oral naming at first were precluded by the patient's persisting mutism, but he began to improve in repeating dictated letter names long before he could name visual or tactile letters.

These results with single letters conform to a previously reported finding[7] that a patient with dominant hemisphere lesions is likely to improve more rapidly in tasks that involve "identity" than in "nonidentity" per-

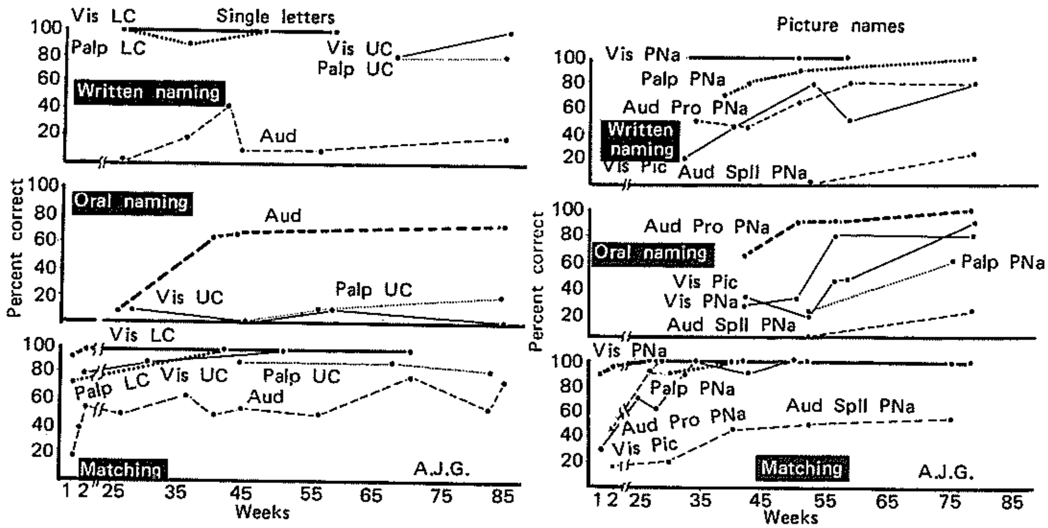

Figure 1. Responses by patient A.J.G. involving single letters (left side) and three-letter word picture names (right side). Data points represent the best performance on any test within a given three week period. Heavy lines and heavy dashes represent identity tasks. Nonidentity tasks are indicated by thin lines, dashes and dots. Vis = visual, Aud = auditory, Palp = palpated, UC = upper case, LC = lower case, Pro = pronounced as a name, Spll = spelled, Pic = picture, PNa = picture name.

formances. That is, in visual-visual and tactile-visual matching of letters, the test stimuli and correct comparison stimuli on each trial are equivalent on the basis of shared physical dimensions: Oral naming of dictated letters requires only repetition of the same sounds; writing of visual and tactile letters requires only copying of the forms. These are identity tasks. By contrast, matching auditory (dictated) to visual letters, naming visual and tactile letters aloud, and writing dictated letters all involve stimuli and responses that share no features in common; the equivalences must be learned.

The patient's scores on tests with three-letter nouns (figure 1, right side) confirmed the single-letter findings. The identity task of matching printed-word (picture name) samples to printed-word comparison stimuli was intact even during the earliest tests (figure 1, right side, bottom panel). Nonidentity matching tasks, in which dictated-pronounced words, dictated-spelled words, and pictures were to be matched with printed-word comparison stimuli, were all deficient during the first two weeks. During this time the patient was mute, precluding tests of spoken naming, and no tests of writing were attempted initially.

Over the next 85 weeks of testing, matching, naming and writing all improved, with identity tasks first, nonidentity tasks more slowly, and responses to dictated-spelled words remaining the most deficient.

Patient R.W.'s test scores for single-letter and three-letter word materials are shown in figure 2. Although the time course is plotted in months, rather than weeks, the relative trends are like those of patient A.J.G.

Both patients also underwent tests with other materials—pictures, colors, color names, numbers, number names, dot clusters, trigrams, and manipulatable objects. Within each material, matching, naming and writing performances in identity tests were either superior to or not worse than corresponding performances in nonidentity tests, both initially and over the course of testing.

Patient F.F. was tested over a six week period. Retests of the major findings were conducted over several weekly sessions during this period and showed no essential changes. For this reason, the data are shown in bar-graph form, representing performance averages (figure 3).

The heavy bars in figure 3 denote identity tests. The data corroborate the findings shown for A.J.G. and R.W: performances on identity tasks exceed or equal those for the nonidentity tasks within each type of stimulus material.

The findings with these three patients sup-

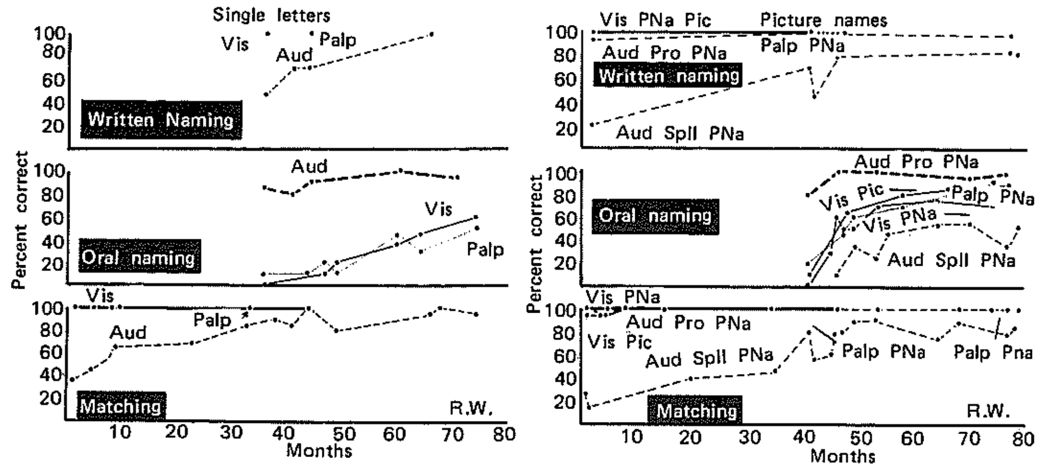

Figure 2. Responses by patient R.W. All test stimuli were lower case.

port our earlier observations. Particularly relevant here are the observations that (1) patients with total aphasia still can perform identity matching and writing tasks, and (2) the distinction between identity and nonidentity tasks is maintained in oral naming even while the patient is emerging from the period of initial mutism.

Double deficit in oral naming. In contrast with the matching and written naming, patient A.J.G.'s oral naming performance was virtually nonexistent under any conditions before week 40. When first tested formally in weeks 25 through 28 with single letters (figure 1) and digits, he failed utterly to echo any dictated names or to name any stimuli presented in visual, auditory or tactile modalities. On many trials, he made no utterance at all, while on others he managed a barely audible sigh or an inarticulate grunt.

Retested in week 40 and later, he improved greatly in the identity tests of echoing dictated single letters and picture names (figure 1), color names, digit names, and object names. On the nonidentity naming tests, however, he showed more severe impairment. In time, nonidentity naming of digit and picture stimuli improved considerably, but nonidentity naming of single letters and colors remained poor. After his ability to repeat aloud was demonstrated, the errors in his oral naming tests no longer could be attributed simply to mechanical dysarthria, since he now had proved able to vocalize the individual responses in the tests of repeating from dictation. Analysis of his errors on the nonidentity oral naming tests showed that he either remained silent (nonresponse) or uttered responses that bore little resemblance to those required on individual trials (figure 4). In the oral naming tests with colors, color names, and manipulable objects, many of the required responses were polysyllables, such as "yellow," "matchbook," "nut and bolt," etc. On these tests, his identity performance was impaired but was nevertheless far superior to his performance in the nonidentity naming of the visual or palpated stimuli.

Patient R.W. failed all informal attempts to test oral naming before month 36. These included attempts to engage him in echoic repeating aloud of dictated sounds and short words. In the formal tests, conducted after informal testing indicated that the attempt was worthwhile, improvement also occurred first in the identity tests of echoic repeating aloud from dictation. Figure 2 shows the data for single letters and picture names.

Oral naming thus was shown to be separable into two major deficits. The first, present initially, had to be classified as an output disorder, since oral naming was deficient in response to all test stimuli, and the matching and writing performances had shown that the input channels themselves were intact or nearly so. Once this oral naming output disorder cleared away, another disorder manifested itself, like those found in written naming and matching-to-sample, in nonidentity tasks. Since input and output now were

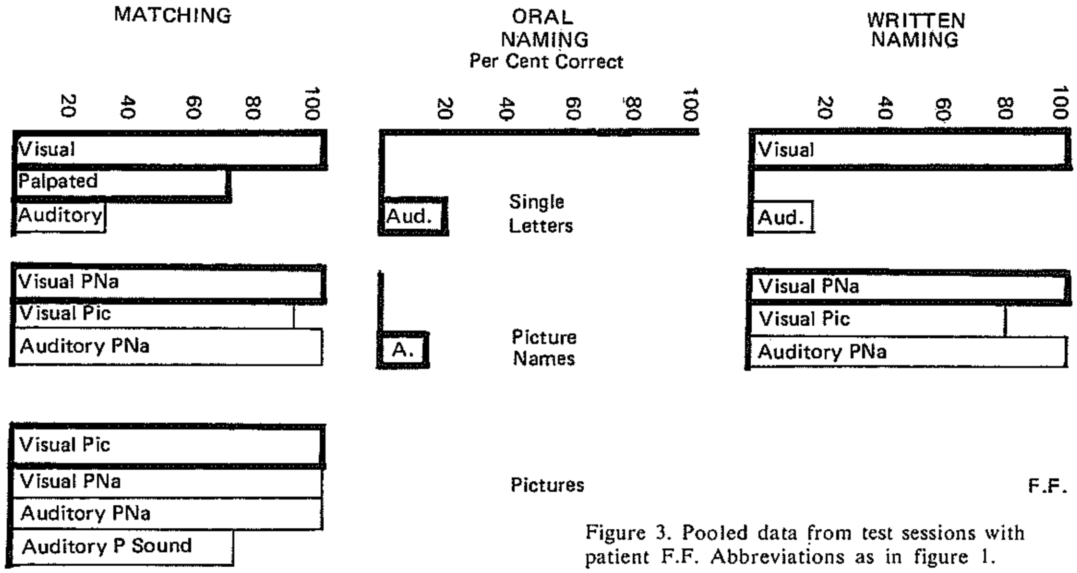

Figure 3. Pooled data from test sessions with patient F.F. Abbreviations as in figure 1.

both intact or nearly intact, the emerging oral naming deficit had to be classified as relational: oral naming was deficient only in response to certain stimuli.

Data for patient F.F. (figure 3) shows him at the stage of total mutism; as of the last period, he had not produced enough utterances to permit scoring of his oral speech responses.

Comparisons of oral naming, written naming, and matching-to-sample. Once the speech output disorder had improved, as reflected by intact oral identity naming (repeating aloud from dictation), considerations of mechanical sound production no longer could account for the patients' failures in nonidentity oral naming tests. From then on, valid comparisons could be made among nonidentity tests in which matching, writing, and oral naming were required as responses to the same stimuli.

All three patients showed a superiority of matching over both oral and written naming on all tests where such comparison was possible. The superiority of matching could have resulted from the limited number of choices available. There were no such limitations on the response in the written or oral naming tasks; the margin for error accordingly was wider in the naming tasks.

Further consideration of the requirements for oral and written naming, however, suggests that the margin for error is slightly greater for written naming; more individual responses—the single letters comprising the words—are required for the total written response than for the short monosyllables in most of the oral naming responses in these tests. Accordingly, it is of interest that the patients here showed

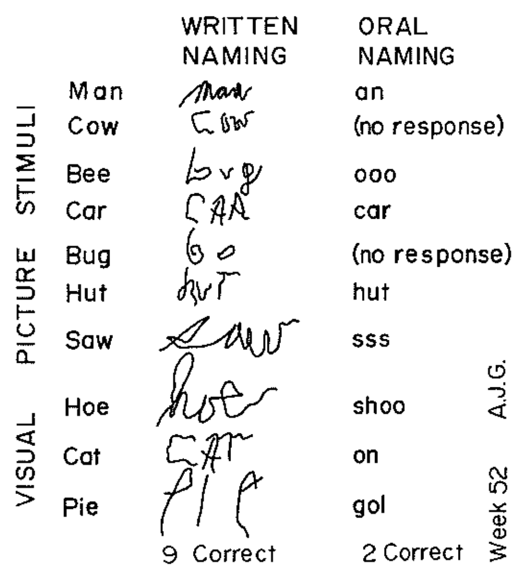

Figure 4. Oral and written naming responses by A.J.G. to visual picture stimuli during week 52. Responses to 10 pictures are shown. Oral naming of dictated picture name stimuli and written naming of visual picture name stimuli were intact for these exact stimuli.

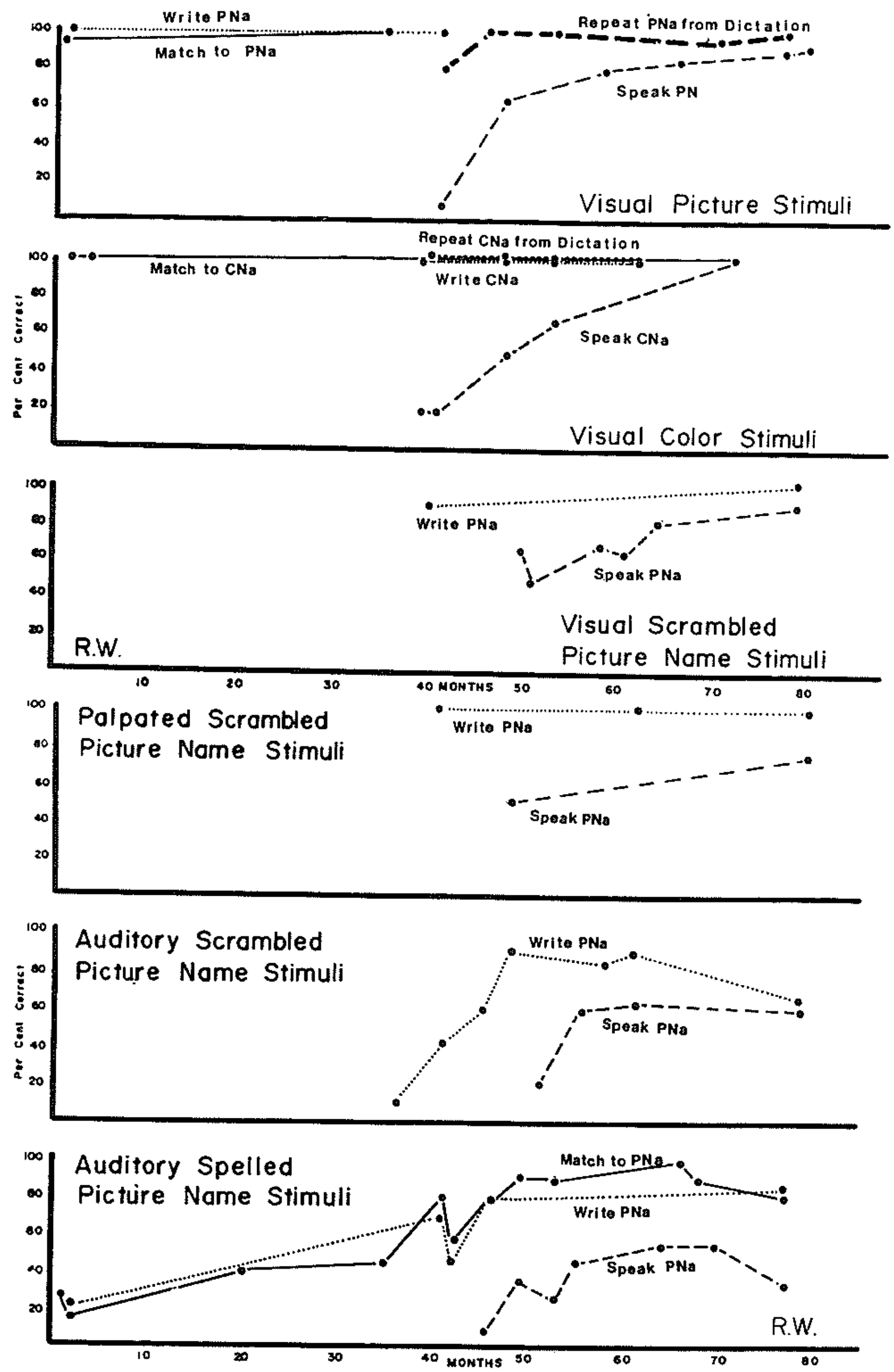

Figure 5. Comparison of matching, oral naming, and written naming for R.W. The data for nonidentity tasks (thin lines, dashes, dots) are plotted only when the corresponding identity form of the task was intact, and the identity data are shown only to indicate the appropriate control performance. The test stimuli for matching, oral naming, and written naming are labeled on each graph.

superiority of written over oral naming, especially in view of the superiority of oral over written naming previously reported from this laboratory.[7]

The comparison of written and oral naming could be made for A.J.G. and R.W. only after the identity responses for both were shown intact. For patient F.F., the comparison remains invalid, since he produced no scorable oral responses. When written and oral naming were compared in response to the same test stimuli, patient R.W. was the most consistent. Several years before oral naming responses emerged to testable levels, he was able to write in response to some stimuli. Even after oral identity naming had become satisfactory at about 40 months, the scores for oral nonidentity naming did not approach those for nonidentity writing. Figure 5 illustrates performances of patient R.W. in response to visual test stimuli (pictures, colors, and scrambled picture names), auditory stimuli (dictated-spelled and dictated-scrambled picture names), and tactile stimuli (scrambled picture names).

Patient A.J.G. (figure 6) showed the same superiority of nonidentity written naming over oral naming in response to visual and tactile scrambled words and colors and, somewhat less clearly, to pictures. The relation was reversed, however, in response to visual digits and was equivocal in response to tactile digits (figure 7). He was better at saying than at writing the names of the digits. On these tasks, many of his printed responses closely resembled the correct responses, but not enough to permit their being scored as correct (figure 8). Patient R.W., unfortunately, was not tested for digit naming and writing until both performances had become perfect.

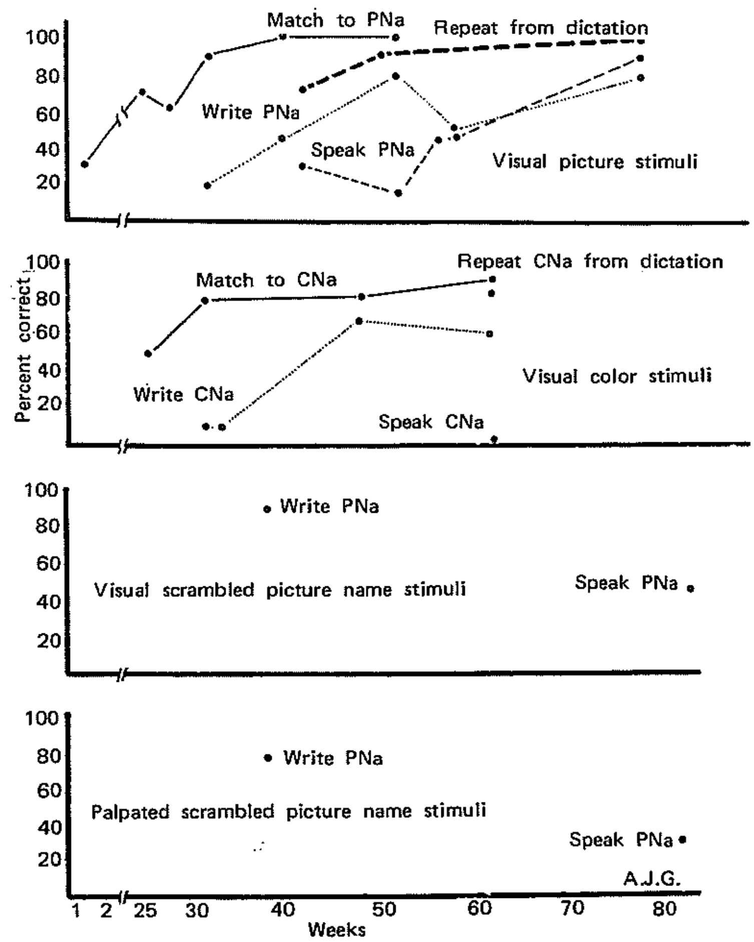

Figure 6. Comparison of matching, oral naming, and written naming for A.J.G. The conditions of the tests and the recording of data are the same as for figure 4. CNa = color name.

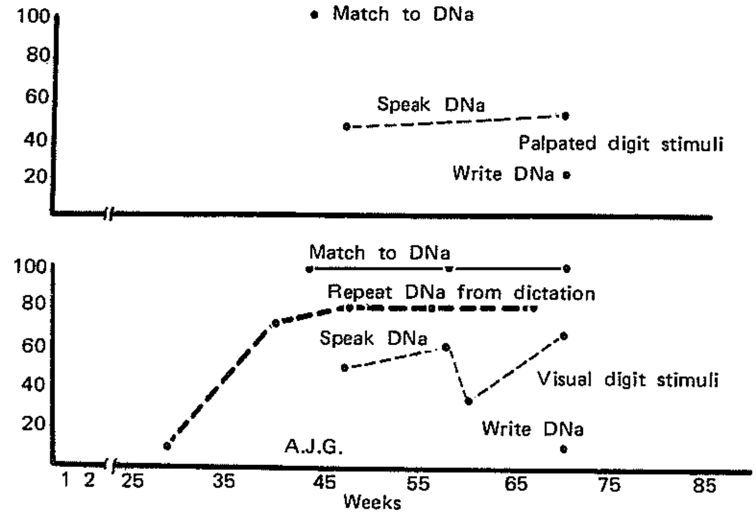

Figure 7. Comparison of matching, oral naming, and written naming for A.J.G. The conditions of the tests and the recording of data are the same as for figure 4. DNa = digit name.

The data for these subjects indicate that written and oral naming need not rise and fall together in aphasic deficits; a degree of independence exists between the two performances.

Sounds of words versus letters. In a previous report,[10] patient R.W. had better scores on tests involving the sounds of words (picture names) than on tests involving the sounds of single letters. Figure 2 includes his early data, shows their evolution over the years since the original report, and demonstrates other findings not then available. He easily matched dictated picture names to printed picture names and to pictures, but he did poorly in matching dictated single letters to printed single letters and in matching dictated-spelled picture names to visual picture names and to pictures. He also easily wrote picture names from dictation but did poorly in writing these names when dictated in spelled forms and in writing individual single letters from dictation. Oral naming, not previously testable, showed a similar deficit: he named printed picture names aloud but did poorly in naming single printed letters aloud; when presented with palpated stimuli, he named picture names aloud but did poorly with single letters.

Performances of A.J.G. (figure 1) were similar. Although his scores started low for the matching of dictated picture names to printed picture names and to pictures, they soon exceeded those for the matching of dictated single letters to printed single letters. Oral naming of visual picture names exceeded that for visual single letters, and written naming of dictated picture names exceeded that for dictated single letters.

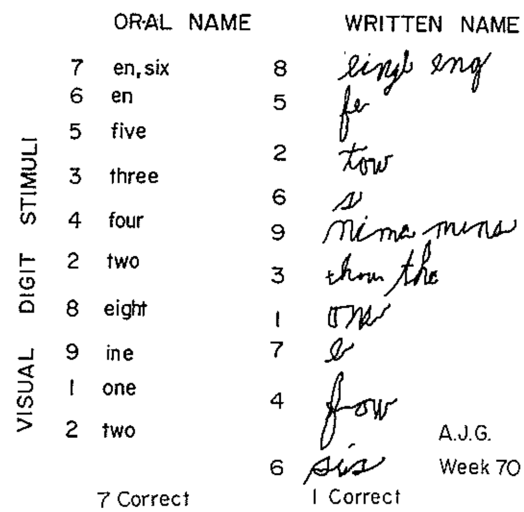

Figure 8. Oral and written naming responses by A.J.G. to visual digit stimuli, during week 70.

F.F. (figure 3), although unable to produce oral naming responses, showed similar results in matching and in written naming responses. He was more successful in matching dictated picture names to visual picture names and pictures than in matching dictated single letters to printed single letters, and was better in written naming of dictated picture names than of dictated single letters.

We have presented these differences between picture names and single letters only sketchily; we believe they are relevant to broader conceptions of language processes, and we are preparing a separate communication that will incorporate these data in detail.

Discussion

The present cases clinically typify the common syndrome of total aphasia, as traditionally defined.[1] Our test methodology has delineated several features of aphasic performance that have passed unemphasized in most previous reports. Analysis of these features leads to new possible interpretations of the nature of the syndrome.

Initially, no oral naming responses occurred under any test condition. In spite of this mutism, some performances involving written naming and matching-to-sample were adequate. These surviving performances, however, need not have involved language; the matching could have been based on physical identities, and writing could have been accomplished by copying. At this stage, the deficit profile was consistent with that predicted by traditional and more recent studies of the nondominant hemisphere functions.[11,12] In this context, the more rapid improvement in the older man than in the younger boy is of interest in relation to the postulated declining "plasticity" of the damaged brain with age.[13] In the absence of direct anatomic findings, however, the possible role of a damaged dominant hemisphere also must be considered. For these reasons, the terms "recovery," "restitution," etc., have been avoided, and "emergence," "improvement," and the like are used instead. Further analysis is confined to behavior alone.

The emergence of oral naming as a testable response, eliminating elementary anarthria as a sufficient explanation for the deficit, revealed two findings relevant to mechanisms of the oral naming deficit. The first was a persisting deficit in nonrepetitive oral naming, accompanied by a differential superiority of written naming on the same tasks. This persisting relative superiority of written naming, even after oral naming was adequate on tests of repeating from dictation, is of special interest largely because most theses of aphasia state or imply that written naming in some way depends on oral naming and is expected to be at least as badly impaired, usually more so, in cases of motor aphasia or total aphasia.[14] The present data suggest that written and oral naming have a demonstrable independence from one another. Unlike previously reported cases, the prolonged study of the present cases provided quantitative data from which this conclusion could be drawn and indicates that the present data are not the exception but are likely to be typical of cases of total aphasia. The usual clinical impression that oral and written naming are similarly affected in cases of total aphasia and motor aphasia may be explained by an anatomic proximity of pathways subserving related but different functions that often causes each separate function to be impaired by the same lesion.

The second finding was that, once oral speech had begun to appear, the profile of errors with different classes of stimulus materials was qualitatively similar in all the forms of response tested—oral naming, written naming, and matching-to-sample. The similarity of the deficit profiles across different response forms suggests a deficit in language behavior common or central to all the modes of response used to assess language behavior. A possible corollary is that the relational oral naming deficit, like the relational written naming and matching-to-sample deficits, actually was present from the beginning but was undetectable because of the anarthric disorder. When the anarthric deficit cleared away, the relational oral naming deficit resembled that observed in written naming and matching-to-sample.

When the tasks were of the nonidentity type, those involving words were done better than those involving letters. This differential deficit was evident from the earliest comparative tests done in each case. It persisted for as long as any impairment in scores was detected, for several years in R.W. More detailed consideration of the data showed that the differential features were not merely a contrast between words and letters, per se. He succeeded in matching visual upper case to dissimilar lower-case single letters and in matching visual scrambled words to pictures. The deficit with letters appeared most reliably on those tasks involving nonidentity response to the *sounds* of letters—matching auditory letter names to visual letter comparison stimuli, writing the letters from dictation, and naming aloud the dictated spelled words—or nonidentity responses that involved producing the sounds of letters—naming seen or palpated letters.

It seems reasonable to raise the possibility that this deficit profile is a central, perhaps *the* central, language deficit in total aphasia. Such a consideration raises questions about traditional notions of total aphasia. Most authors[5] consider total aphasia as a summative or possibly synergistic effect of a lesion producing both Broca's and Wernicke's aphasia. By such criteria, total aphasia would have no distinctive features other than those resulting from the combination of deficits reflecting Wernicke's and Broca's aphasia. The present findings, however, show a deficit profile with unique features, particularly the differential relational deficits involving written and oral naming, and the sounds of words versus letters. If such differential performances characterize the syndrome currently referred to as total aphasia, the profile, along with the complexity of the intact language performances, will prove the term to be inappropriate both in its descriptive and theoretic implications. The findings with letters and words also suggest that basic revision must be made in any theory of aphasia that is based on notions of hierarchial dissolution of performance.

The sequential deficit profile may be summarized as follows: (1) Initial mutism along with intact identity performances in written naming and matching, (2) gradual emergence of identity naming, preceded or accompanied by improvements in nonidentity matching and writing, (3) continued superiority of written over oral naming in nonidentity tasks, even where anarthria was no longer a factor, and (4) superiority of performances involving the sounds of words (picturable nouns) over those involving the sounds of letters. To reveal this profile, it was necessary to test different responses to the same stimulus material, to test identical responses to different stimuli, and to continue the testing over a period of time long enough for oral naming to emerge. The course of change appears predictable, sufficiently so, perhaps, to form a basis for rational therapeutic planning.

Summary

The aphasia profile of three clinical cases, typifying the traditional clinical syndrome of total (global) aphasia, has been studied by a special test methodology over periods up to five years. The findings revealed a lengthy deficit in tasks requiring oral naming responses and a more general deficit in verbal tasks involving written and matching-to-sample responses with a variety of stimulus materials.

With the emergence of oral naming responses weeks or months after onset of the condition, quantitative comparison between scores of written and oral naming responses showed a persisting comparative deficit in oral naming. With time, the more general deficit on verbal tasks showed improvement with all materials and forms of response except those involving verbal responses of or to the sounds of single letters.

These cases represent a newly delineated syndrome of aphasia and are a unique subgroup that may prove typical of the syndrome currently classified as total (global) aphasia.

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