A Divergent Semantic Model of Intervention In Adult Aphasia

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Recent theoretical and empirical evaluations of the language behavior of persons with aphasia suggest that there are both convergent and divergent components to this language impairment (Chapey, 1977; Chapey, Rigrodsky, and Morrison, 1976; Chapey, Rigrodsky, and Morrison, 1977). Specifically, the findings of this research indicate that some persons with aphasia will be impaired in their ability to respond appropriately in communicative contexts which involve the recognition or reproduction of highly learned semantic responses and which require the ability to converge upon one correct answer. These individuals are unable to respond appropriately to questions such as "I write with a pencil or a ____." "Point to the one that is used for writing." or "Say the word pen."

The above research also shows that most persons with aphasia will be impaired when communication requires formulation and searching for a variety of new ideas and relationships, producing a number and variety of different kinds or categories of response, and extending the boundaries of what they already know. That is, they will have a divergent semantic impairment. Thus, when individuals with aphasia are asked to respond to a divergent taks such as "Can you name objects that can roll?", "Can you think of problems that anyone might have in eating lunch?", or "Can you list many different uses for a pen?" they will demonstrate an impairment in their ability to produce a number and a variety of semantic responses. Persons with severe aphasia will be impaired in both convergent and divergent semantic behavior; less impaired individuals will only be impaired in their divergent semantic behavior (Chapey, 1977).

Traditional Therapy With Aphasics

Traditionally, aphasia has been treated by having patients respond to tasks such as those suggested by Butfield and Zangwill (1946), Goldstein (1948), Wepman (1953), Schuell, Carroll, and Street (1955), Schuell, Jenkins, and Jiminez-Pabon (1964), Vignolo (1964), Sarno, Silverman, and Sands (1970), Aurelia (1974), and Keenan (1975). An evaluation of the semantic tasks presented in these therapeutic schemas relative to the Guilford (1967) model of divergent and convergent behaviors indicates that aphasiologists have recognized the convergent component of the convergent-divergent language continuum. That is, the tasks which have been presented to persons with aphasia call for the reproduction of already learned material, and require subjects to converge upon one correct, previously agreed upon answer. For example, Schuell, Carroll, and Street (1955) suggest that the patient repeat words, phrases, and sentences, name objects, and complete phrases and sentences such as "a cup of ___" in order to increase the individual's language usage. Sarno, Silverman, and Sands (1970) require that subjects imitate sounds, words, and phrases in order to complete various levels of their programmed instruction regimen. Many of the aphasiologists listed above also indicate that the patient should be encouraged to produce longer, more spontaneous utterances during therapy. For example, Butfield and Zangwill (1946), Vignolo (1964), and Keenan (1975) suggest

that the patient be encouraged to describe actions, conditions, or pictures, or have 'conversations'. Schuell, Jenkins, and Jiminez-Pabon (1964) state that the person should be asked to "Tell . . something about ___ (coffee, clock, butter)". However, in each instance, response restrictions are convergent in nature and task instructions preclude the utilization of a divergent strategy. That is, the individual must describe this action or object or converse about that specific topic. Further, the object of this exercise is usually to "analyze whether the phrase was correct or how it might be made better" (Keenan, 1975).

Thus, a review of the semantic materials which have been used in aphasia rehabilitation indicates that tasks do not require the production of multiple possible solutions to problems nor do they ask a client to produce a variety of different kinds or categories of ideas, to think about what they know in new ways, or to extend the boundaries of what they already know. That is, the tasks which have been used in the rehabilitation of aphasic persons have not reflected the fact that a divergent operation can be used in producing semantic responses.

A Divergent Model of Therapy

It would seem logical that if a major component of the aphasic language defect is a divergent one, a major focus of therapy might be the facilitation of the individual's willingness and ability to produce divergent semantic responses and to increase the frequency with which such behavior occurs.

The Divergent Model of therapy which follows describes one possible method of intervention with mild and moderately impaired individuals who have some ability to comprehend oral language. The suggestions and activities which are presented were gathered informally and represent what the author has found helpful in clinical work with adults who have aphasia. It should be noted that no previous author used the concepts of divergent and convergent semantic behavior as a framework for aphasia therapy.

Rationale

This divergent approach to therapy is based upon the belief that spontaneous communication requires the use of a divergent semantic strategy. Indeed, most definitions of language and communication have components which are highly suggestive of a divergent strategy. For example, Hughy and Johnson (1975) stated that language is primarily used for information getting and giving, problem solving, and persuasion. Each component of this definition requires the use of a divergent strategy to some degree. For example, in asking for directions to an unfamiliar destination, an individual is often required to pose a variety of different questions which will enable him to secure the precise information he desires. Another definition, that proposed by Muma (1975), notes that communication entails the ability to switch or shift sets of reference as topics change, to initiate such shifts, and to overcome obstacles to communication flow. In order to communicate we need both convergent and divergent abilities. Communication goes far beyond what we have traditionally used in diagnosis and therapy with an aphasic individual.

A second rationale is based on the observation that aphasia results from an inability to produce the highest level CNS integrations (Wepman, 1951). Recent research by Bolwinick (1967) has indicated that the highest level cognitive integrations are: thinking (and divergent thinking is thinking); problem solving (and divergent behavior is viewed by many as one component of

problem solving); and creativity (and divergence is often used as a synonym for creativity).

Divergent therapy is also rooted in the fact that aphasia is a problem in language retrieval (Schuell, Jenkins and Jiminez-Pabon, 1964) or the searching and scanning mechanism which selects among many possibilities. Schuell, Jenkins and Jiminez-Pabon (1964) noted that the search mechanism is controlled by instructions, directing it to go to a specific address and bring out information. They suggest that appropriate stimuli are required to activate or reactivate patterns. Guilford (1967) and his associates indicate that divergent behavior involves the use of a broad search of memory storage while convergent production involves a narrow search of memory storage. Use of both divergent and convergent tasks in therapy appears to maximize the retrieval mechanism and focus on the essence of the impairment in aphasia.

Principles

Since moderately impaired individuals with aphasia will retain some convergent and divergent behaviors, it may be advisable to begin therapy with convergent and divergent semantic tasks and gradually increase emphasis on divergent tasks. Intervention may also be oriented toward the following traditional therapeutic principles:

1. Begin with the tangible (here and now) and move toward the representational.
2. Begin with the concrete and move toward the abstract.
3. Begin with the simple and move toward the complex.
4. Begin with the real and move toward the possible.
5. Begin with actions upon objects and move toward verbalizations concerning those actions.
6. Begin with simple classifications and move toward reclassifications and multiple classifications.
7. Begin with intrapropositions (one relationship) and move toward interpropositions (logical relationships among propositions previously formed) (Piaget, 1950).
8. Begin with exaggerated sensory stimulation - for example, talking through a microphone or using a variety of inflectional patterns (McConnell, Love, and Smith, 1974) and gradually decrease this exaggeration.
9. Begin with short responses and move toward longer and longer responses.
10. Begin with continuous reinforcement and move toward intermittent reinforcement (Grant, Hake, and Hornseth, 1951; Jensen and Cotton, 1960).
11. Begin with clinician reinforcement and move toward self reinforcement (Staats, 1968).

During the course of both diagnosis and therapy, the speech clinician may also attempt to isolate specific conditions under which divergent semantic retrieval is maximized and to increase the number and variety of these conditions. That is, with whom and under what conditions does divergent semantic behavior increase? The clinician may wish to manipulate some of the following variables and observe their effect on patient divergent behavior: the listener, referent, intent, situation, cueing devices, repetition and reauditorization, intonation, level of abstraction, cognitive complexity, linguistic complexity, length of stimuli, and frequency of occurrence of word stimuli. The conditions

which augment divergent semantic retrieval for each patient should become an integral component of all subsequent sessions.

Stages

The proposed Divergent Model of therapy suggests that the initial stage of intervention may focus on two of the prerequisites of language, orientation and attention. This suggestion is based upon the rationale that individuals with aphasia should be provided with an opportunity to hear and grasp the divergent semantic behaviors of others over and over again. That is, auditory stimulation is seen as an essential component of language retrieval in aphasic patients (Schuell, Carroll, and Street, 1955). Thus, for example, the clinician might videotape a group of normal adults responding to a divergent task such as "Can you think of problems that anyone might have in eating lunch?" Concomitantly, the patient could be reinforced for all listening and attending behavior. Although no verbal responses would be required during this phase of therapy, all attempts to produce verbal responses that relate to the task at hand could be highly reinforced.

Exposure to the vidoetaped responses of others may prove to be a vicarious learning experience (Bandura and Walters, 1963) for the individual with aphasia. This suggestion appears to be in consonance with Cooper's (1976) finding that persons with aphasia are able to model the verbal behavior of normals and improve their explanations of material that is presented.

As soon as the individual begins to produce divergent verbal responses, intervention should focus upon strengthening his ability to retrieve numerous and varied semantic responses through continuous reinforcement of relevant responses.

Tasks

There are a number of divergent tasks or tasks which have components which appear to stimulate divergent semantic behavior. Davis and Scott (1971), Guilford and Hoepfner (1971) and Parnes (1966) have shown that divergent semantic ability is strengthened in normals through practice and by teaching techniques for actually producing new idea combinations. Practice in generating responses to the tests which are described below also appears to increase the ability of persons which aphasia to produce a greater number and variety of semantic responses. All of the tests listed below were developed and researched by Guilford (1967) during the twenty years that he headed the Aptitudes Research Project at the University of Southern California.

These tests are as follows:

1. Common Situations. The individual is asked to list problems that are inherent in a common situation (Guilford and Hoepfner, 1971). For example, the person might be asked: "Can you list problems that anyone might have in eating lunch?"
2. Brick Uses. This test requires that the individual list many different uses for a common object (Guilford and Hoepfner, 1971). For example, patients might be asked, "Can you think of different uses for a tin can?"
3. Product Improvement. In this test, the subject is asked to suggest ways to improve a particular object (Guilford and Hoepfner, 1971). For example, "Can you think of different ways to improve a toy

elephant so that children would have more fun playing with it?"

4. Consequences. The individual is asked to list the effect of a new and unusual event (Guilford and Hoepfner, 1971). For example, subjects might be asked: "Just suppose that people no longer needed or wanted sleep. What would happen? List your ideas and guesses."
5. Object Naming. In this test subjects list objects that belong to a broad class of objects (Guilford and Hoepfner, 1971). For example, "Can you name objects that can roll?"

Conclusion

The present paper defines one approach to aphasia therapy which the present author has found to be clinically effective with moderately and mildly impaired individuals. The focus of this therapy is the retrieval of divergent semantic behavior or a number and a variety of verbal responses. The major principles for facilitating this behavior and materials which might be used in this type of therapy are described. Clinicians who use this approach should evaluate the specific language assets and liabilities of each patient so that the therapeutic effort will be individualized to fit the needs, interests, and abilities of each person who receives such therapy.

It is hoped that use of divergent tasks will broaden the ability of persons with aphasia to communicate a greater number and variety of ideas in life situations.

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Discussion

Q. Have you collected any data concerning the effectiveness of the techniques?
A. I am in the process of collecting data. Each patient is being used as his own control. Half the subjects receive the convergent techniques first; the other half receive the divergent tasks first. The data collected to date appears to substantiate my belief that divergent therapy is effective.

Q. Has divergent/non-divergent behavior been compared in non-aphasics?
A. During his twenty years as project director of the Aptitudes Research Project at the University of Southern California, J.P. Guilford compared 120 types of behavior in hundreds and hundreds of non-aphasic adults and children. The major focus of this research was to define the many types of behavior available to normal adults.

Q. Has the construct validity of divergent thinking and convergent thinking been demonstrated?
A. The construct validity of divergent thinking and convergent thinking was statistically demonstrated for non-aphasic individuals by J.P. Guilford. I have tested aphasic subjects and found that although divergent and convergent semantic behaviors are highly correlated for these individuals, they are two separate, distinct capacities. This statistical analysis will be published in an upcoming issue of the Archives of Physical and and Rehabilitative Medicine.

Q. Are there criteria for judging divergent tasks?
A. One of the essential components for a definition of divergence is that the response be relevant to the question. For example, if I ask you to 'think of objects that can roll' and you respond saying "That's an interesting question", your answer is not a relevant nor scorable response. The only way that one can establish an individual's fluency and flexibility (divergent) score is to train two or more judges to evaluate divergent responses.

Q. From the description, divergent tasks ask "Can you think of" whereas convergent tasks ask "Tell me the name of". But if you think about a divergent task, you have to tell me what you thought of and the way they were though of .
A. The concepts of divergent and convergent production were developed by Guilford. His research demonstrates that most testing is convergent in nature. I agree. Since I was adapting Guilford's material to aphasia, I used his terminology and his instructions for each task. The aphasic individuals that I tested did not appear to have difficulty grasping the instructions. One could rephrase the questions and ask "Tell me the name

of objects that can roll" and "Can you think of the name of this object (pencil)?" The important difference is not the wording of the task but the fact that different types of thought processes are used in responding to the two questions. Most mild and moderately impaired aphasic individuals are capable of producing both types of response.

Q. The problem is that Guilford did not look at people who had difficulty with retrieving a word. Aphasic individuals have a problem communicating information that has been retrieved from long-term memory in the divergent task.

A. Language behavior - whether it is divergent, convergent, or any other type - necessitates the use of a memory and a retrieval mechanism. In addition, almost all language behavior requires thinking. ALL language tasks are therefore limited, since we can never be sure if the individual knew the convergent or divergent response but could not retrieve a correct response. In a divergent task, the aphasic person may be able to produce a correct response even though he cannot converge upon specific words or specific syntactic structures - since highly accurate syntactic and semantic rules are not necessarily required. The individual may, on occasion, be able to express an idea in a circumlocutious or somewhat inaccurate manner and still receive credit for his response.