Cognitve Assessment of Adults with Acquired Language Disabilities

By

Cherie L. Wadle

In Partial Fulfillment of the Requirements
For a Master of Science Degree
In Communicative Disorders
University of Wisconsin-Stevens Point

August, 1978
COGNITIVE ASSESSMENT OF ADULTS WITH ACQUIRED LANGUAGE DISABILITIES

By

Cherie L. Wadle

Approved by:

Judith E. Pratt, Ph.D., Chairman
Donald L. Aylesworth, Ph.D.
Gerald E. Chappell, Ph.D.

8/15/78
8-15-78
8-15-78
ACKNOWLEDGMENTS

This is to acknowledge all those people who helped me keep my sanity during this time of chaos and growth. Initially, I would like to thank my chairperson, Judith Pratt. Her guidance and encouragement made me feel I could conquer what seemed an impossible task. My appreciation also goes to my committee members, Gerald Chappell and Donald Aylesworth who willingly gave their time to my project.

For the people who participated as subjects in this study I hold a high degree of respect and appreciation since their time was spent in unselfish search of aid for others like themselves.

Finally, there are those who found time to support me even through their own chaos. I wish to thank my fellow graduate students and friends:

Cindy Abel-Knapp               Mary Holtz
Mary Bleser                    Kim Kolumba
Betsy Costello                 Sue Kuphall
Denise Donlon                  Betsy Lehman
Nancy Elsner                   Jane Siegel

and Cindy Stadelman, my roommate, who went through more pain than I to finish this study.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>ACKNOWLEDGMENTS</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter</td>
<td></td>
</tr>
<tr>
<td>I. INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>II. REVIEW OF THE LITERATURE</td>
<td>7</td>
</tr>
<tr>
<td>Normal Development</td>
<td>7</td>
</tr>
<tr>
<td>Cognitive Assessment and Training in Adults</td>
<td>10</td>
</tr>
<tr>
<td>III. METHOD</td>
<td>14</td>
</tr>
<tr>
<td>Subjects</td>
<td>14</td>
</tr>
<tr>
<td>Materials</td>
<td>14</td>
</tr>
<tr>
<td>Procedure</td>
<td>15</td>
</tr>
<tr>
<td>Scoring</td>
<td>17</td>
</tr>
<tr>
<td>Data Analysis</td>
<td>17</td>
</tr>
<tr>
<td>IV. RESULTS</td>
<td>19</td>
</tr>
<tr>
<td>Task Presentation</td>
<td>19</td>
</tr>
<tr>
<td>Scoring</td>
<td>19</td>
</tr>
<tr>
<td>Reliability</td>
<td>20</td>
</tr>
<tr>
<td>Analysis of The Data</td>
<td>20</td>
</tr>
<tr>
<td>Intra-subject Analysis</td>
<td>20</td>
</tr>
<tr>
<td>Inter-subject Analysis</td>
<td>21</td>
</tr>
<tr>
<td>Cognitive Tasks</td>
<td>22</td>
</tr>
<tr>
<td>Social Adjustment Task</td>
<td>22</td>
</tr>
<tr>
<td>Discussion</td>
<td>23</td>
</tr>
<tr>
<td>V. SUMMARY AND CONCLUSIONS</td>
<td>25</td>
</tr>
<tr>
<td>Purpose of the Study</td>
<td>25</td>
</tr>
<tr>
<td>Normal Development and Assessment in Adults</td>
<td>25</td>
</tr>
<tr>
<td>Methods and Results</td>
<td>26</td>
</tr>
<tr>
<td>Conclusions and Implications</td>
<td>27</td>
</tr>
</tbody>
</table>

iv
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIBLIOGRAPHY</td>
<td>30</td>
</tr>
<tr>
<td>APPENDIX A</td>
<td>33</td>
</tr>
<tr>
<td>APPENDIX B</td>
<td>43</td>
</tr>
</tbody>
</table>
CHAPTER I

INTRODUCTION

Brain damaged, aphasic, and language disabled are labels which have been used interchangeably, not only with each other, but with an abundance of other labels, all intended to describe elusive deficiencies in communication abilities. These are terms which have been repeatedly applied to children and adults, though not without controversy. And although the labels are the same for both populations, the treatments have remained dissimilar. Due to the nature of the present study, a relatively unambiguous label must be chosen for use in written discussion. Since controversy is so strong concerning the term aphasia, and the term brain damage provides too little information, it seems most appropriate to discuss acquired language disabilities in adults.

The cognitive-linguistic approach for the assessment and treatment of language disabilities in children and adults is far from new. However, acceptance and application of this viewpoint is relatively less common in adult language disorders. Cognitive aspects are seldom considered in dealing with adult language disabilities even
though some language authorities consider cognition and language inseparable (Piaget and Inhelder, 1973; Vygotsky, 1962; Goldstein, 1948; and Wepman, 1958).

In 1948, Goldstein presented ideas and evaluative measures for adult language disabled clients based upon the relationship of intellect and language. These processes are closely related according to Goldstein, since they are significant to humans in dealing with environmental situations.

Since at least 1958, Wepman has been encouraging speech and language pathologists to treat the "whole person" not just his (the client's) language. Wepman suggested at that time that, "A patient's language doesn't improve--he improves and his language reflects it." His opinion concerning the importance of cognitive considerations is evident in his definition of intelligence:

...the innate capacity to adapt to all or any life situations; to symbolize both verbally and nonverbally at both the level of concrete and abstract;...Intelligence then is the innate capacity to utilize one's thought processes (Wepman, 1976, p. 131).

Although the literature is filled with arguments as to the nature of the relationship between intelligence and language, many authors believe the relationship does exist in adults (Vygotsky, 1962; Goldstein, 1948; and Wepman, 1958) as well as in children (Piaget and Inhelder, 1964; Clark, 1974; and Morehead and Morehead, 1974).
When an adult loses all or part of his ability to communicate, the following possibilities (Goldstein, 1948) can be considered: unrelated, separate lesions in the brain may create corresponding disabilities of speech and cognition; a speech disability may be a by-product of the disordered intellect; language may not represent the order of thought formation; concrete thought and concrete speech may replace abstraction; language may express and influence thought formation; and emotional disturbances may affect speech.

Both Goldstein (1948) and Wepman (1976) suggest that intelligence is reduced in the post-morbid aphasic. They would most likely also agree that the reduction of intelligence is in direct relationship to the reduction of language abilities.

Perhaps Wepman (1976) was correct when he suggested that the cortical damage that occurs in some cases directly affects the aphasic's thought processes and thus indirectly affects his communicative functioning. A list of 34 observations which was composed by Wepman (1951) in his book, *Recovery From Aphasia*, reflects an interesting sample of frequently observed nonlinguistic behavior deviations in his aphasic patients. Included were the following: loss of memory; abstract-concrete imbalance; poor judgment; constriction of thought and interest; and reduced ability to generalize, categorize, group, or plan future action. In addi-
tion, Wepman (1964) has drawn parallels between levels of language disability in aphasics, levels of language development in children, and levels of dependence in both populations. If the language disability acquired by the adult is secondary to a loss of intelligence as Wepman (1976) suggests, or if language and cognition are considered inseparable, in any way, it may be more feasible to assess and treat this person's language indirectly through cognitive abilities similar to those used with developmentally delayed children. We should assess the disorder rather than the symptoms.

An investigation of aphasia characteristics through an application of Guilford's model of behavior was completed recently by Chapey, Rigrodsky, and Morrison (1977). The findings indicated that although most aphasiologists have treated the disorder as one of convergent semantics, there is also a divergent component left unconsidered. The divergent disorder leaves the aphasic unable to approach topics with a variety of words and/or ideas.

The relationship between language and cognition has been more clearly defined in the area of child language. Inhelder and Piaget (1964) concluded that certain aspects of language and memory coincide with and involve such cognitive abilities as classification, seriation, and conserva-
tion. According to these authors, the development of logic is not only "mirrored" but advanced by language. In 1973, Piaget and Inhelder concluded that memory and "intelligence" (particularly in relation to conservation) develop similarly and are in fact inseparable. In addition, Duska and Whelan (1975) believe that both "cognitive development" and "abstract reasoning ability" are essential to a child's moral development.

These considerations about child language development are further emphasized by Morehead and Morehead (1974) in the following statement about therapy.

The coordination of representational systems with advancing intellect should be central to language training even during the earliest stages of development... Although a child may be taught to imitate a word or linguistic rule, unless these language forms are appropriate to his level of cognitive development, they will not enter into the integrated processes of mental growth. Instead they will remain imitative tricks, restricted to the specific context in which they were acquired. Many 'carry-over' problems could be avoided by increased attention to the normal interaction of intellectual and linguistic growth (p. 185).

Where does the separation between child and adult language begin or end? Although adult language is more advanced, children develop the ability to comprehend and express through the same basic language as adults. The literature builds a strong case for cognitive-based assessment and therapy in both populations. However, the utilization of such methods with language disabled adults appears to be
limited. It would appear that, as Wepman (1964) suggests, we expect the adult (unlike the child) to move from a disturbed-speech state directly to a normal-speech state through imitation tasks.

The purpose of this study is to determine the correlation between the cognitive and linguistic abilities of the post-morbid language disabled adult, and the implications for assessment and therapy if a relationship exists. The present study will attempt to discover the extent to which the communication ability of the language disabled adult mirrors his/her underlying cognitive abilities. Is cognition a profitable area to tap for information regarding language reacquisition?

To answer this question, a battery of cognitive tasks has been assembled and administered to a group of language disabled adults in addition to a standardized test of aphasia. The tasks vary in difficulty through Piaget's (1973) developmental stages of preoperations, concrete operations, and formal operations. Since the tasks were taken from child research, no norms are available for adult performance on them. Therefore, the results will be presented descriptively.
CHAPTER II

REVIEW OF THE LITERATURE

The premise of this study involves research dealing with two main topics: (1) The relationship of language and cognition in the normal developing child and (2) the validity of using cognition as a diagnostic and/or therapeutic tool for adults with acquired language disabilities.

Normal Development

A recurrent theme within the work of Piaget and his associates (Piaget, 1962; Inhelder and Piaget, 1964; and Sinclair-de Zwart, 1969) is the role of language in the child's mental growth. They have maintained that language is not essential to the child's cognitive development, but is rather a facilitator to learning. The child will develop his mental processes without language. However, language will accelerate and expand this development.

Sinclair (1969) relates Piaget's thinking on the relationship of language and cognition developmentally. She says, "The formation of representational thought is contemporaneous with the acquisition of language; both belong to a more general process, that of the constitution of the symbolic function in general."
Piaget's levels of cognitive development appear to run parallel with the acquisition and expansion of language. The levels he has suggested (1973) as well as some of the characteristics within the stages will be reviewed.

In 1973, Piaget discussed cognitive development in terms of three periods: Sensorimotor intelligence; preparation and organization of concrete operations of categories, relations, and numbers; and formal operations. Within each of these periods are further substages. Since the present study does not include tasks from the sensorimotor period, this period will not be discussed here. Within the second period, Piaget provided two subdivisions: Preoperatory representations and concrete operations.

At the preoperational stage, a child is ego-centric. His perceptions and his speech reveal his preoccupation with himself. At this time, he is becoming adept at forming images in his mind of things that are no longer present. He is able to acknowledge the whole and its parts simultaneously (inclusion) (Sharp, 1969). This knowledge is a precursor for the comprehension of the processes of classification, addition, and multiplication (Burk, 1973).

As the child moves into the concrete operations stage, he acquires further understanding of seriation concepts begun in the preoperations stage. In addition, he is able to complete classificatory tasks including intersections and
matrix tests which involve the simultaneous consideration of two or more criteria. "Both the syntax and the semantics of language involve structures of classification and seriation," according to Inhelder and Piaget (1964). These authors continue by saying that words are placed in and drawn from syntactic classes (e.g., nouns, verbs, adjectives, etc.) by the speaker. Seriation is the basis for the comparative and superlative forms of language as well as hierarchical series (e.g., animal, mammal, dog, etc.).

Another skill is acquired by the child at the concrete operations stage; he is able to conserve. The ability to conserve in his thinking will allow the child to gain control over his observations due to his trust in the stability of his environment (Sharp, 1969). This is the beginning of logical thought, which coincides with the use of logical relations, such as since and because (Piaget, 1959).

Finally, the concept of the null set is comprehended by the child during this stage. However, this does not occur until the latter portion of the stage when the child shifts toward formal operations. The reason for the late comprehension of the zero concept, according to Inhelder and Piaget (1964) is this, "Concrete operations are bound up with the objects to which they apply. This supposes that these objects do exist and so the notion of an empty class is excluded."
When the child enters the period of formal operations, his reasoning becomes abstract, and he can deal with mathematical logic (Sharp, 1969; and Piaget, 1973). Moral judgments are at their highest level now as well.

One can easily see from the above discussion that the child is occupied with much more than just language as he develops. To treat the whole child, we would need to take his cognitive development into consideration. Sinclair (1971) takes this thought one step further when she says,

Our contention would be...that since intelligence exists phylogenetically and ontogenetically before language, and since the acquisition of linguistic structures is a cognitive activity, cognitive structures should be used to explain language acquisition rather than vice versa (p. 123).

Cognitive Assessment and Training in Adults

In 1964, Wepman presented five aphasias representing levels of linguistic regression which paralleled levels of normal language acquisition. Although there is great controversy over the validity of the regression hypothesis, several authors support the investigation of normal development for its application to language disabilities acquired in adulthood. Goldstein (1948) remarked,

From the point of view that development is increasing integration and pathology is disintegration, and the assumption that disintegration goes through similar stages (except in reverse) as the increasing organization in children, these studies should prove productive (p. 35).
Taylor and Anderson (1968) suggest that since these adults experienced normal language acquisition as children, it is probable that studying normal development may enlighten us in regard to their reacquisition.

It must not be taken for granted that the adult with an acquired language disability can be treated in the exact same manner as the developing child, however. The adult will not regress to one level in all areas, but will retain residual language from higher levels (Wepman, 1964). His language is inseparable from him (Goldstein, 1948). Finally, one must consider that the adult's neurological impairment is not presumed to be a factor in the normally developing child (Taylor and Anderson, 1968). However, these cautions do not imply that language reacquisition occurs in a significantly different manner from acquisition of language. Research is necessary to determine the truth or falsity of that statement.

Parallels can be drawn between the assessment of normal language development and the assessment of the language of the disabled adult. Piaget's stand on the relationship between language and cognition (Sinclair, 1969) was mirrored by Goldstein in 1948 when he investigated the relationship between the frequent disturbance of thought processes in aphasics and the "deterioration of the instrumentalities" (i.e., language). His assessment battery included methods
which are currently employed to assess language acquisition.

Goldstein (1948) referred to the loss of abstract attitude in adult language disabilities as being a loss of "simultaneous function" (i.e., a loss of the ability of the brain to deal with two things at the same time). Simultaneous function, as opposed to successive function, is disturbed first when the level of brain functioning is lowered since it is a higher mental process. This process, as was mentioned earlier, is developed by the child in the concrete operations stage and is necessary for classificatory basis of semantics and syntax (Inhelder and Piaget, 1964).

Sorting tasks within Goldstein's (1948) battery reveal a loss of abstract attitude, if the client: Doesn't group all of the objects; doesn't use more than one group; allows only a limited number of objects in each group; rejects suggested groups; or doesn't initiate or carry through a shift of strategy.

Another method of assessment for Goldstein was pantomime, since it represents the presence of abstract attitude. This work preceded the similar use of pantomime as a tool for analyzing child language development (Phalen and Chappell, 1976).

The use of the principles of cognition in language ther-
apy has been dealt with by Wepman (1968 and 1976). He has reviewed several successful attempts with clients who had plateaued when treated only by direct language therapy. Wepman's use of an indirect, process-oriented therapy (e.g., reviewing the client's work with his fellow workers, and card games) proved more effective than traditional adult language therapy.

The intention of this study is to further determine the similarities between child language acquisition and adult reacquisition of language. The tasks were chosen based on the information presented here. Some of the tasks are not new to the field of adult language assessment and/or therapy, but, perhaps, are seldom used. Other components of the present battery are novel to this population. All of the tasks may give additional insight into the patterns of adult language reacquisition.
CHAPTER III

METHOD

Subjects

The subject sample selected for participation in this study consisted of eight adults (four males and four females) ranging in age from 32.1 years to 66.2 years (mean age was 51.9). The subjects were chosen randomly from the files of two hospital speech and language pathologists and from the files of the Center for Communicative Disorders at the University of Wisconsin-Stevens Point. All subjects were at least six months post-onset with the mean period being one year, three months. Three of the subjects were attending therapy at the time of testing. The remainder had been dismissed.

The Aphasia Language Performance Scale (ALPS) was administered by the examiner to each subject as a standardized measurement of communicative ability prior to the presentation of the sequence of experimental tasks.

Materials

The stimulus materials consisted of a series of cognitive tasks of varying degrees of complexity representing Piaget's (1973) preoperation, concrete operation, and formal
operation stages (see Appendix A). These tasks were selected by the examiner from three sources: Burk's (1973) Piaget Attainment Kit (PAK); an Inhelder and Piaget study (1964); and Evelyn Sharp's (1969) text, Thinking is Child's Play. Selections were made on the basis of the complexity of the tasks, the extent of necessary linguistic instruction for the tasks, and the importance of the tasks to language and logic learning. Areas tested included an examination of the extent of egocentrism, as well as the abilities of: Classification; seriation; conservation; imagery; sequencing; inclusion (part-whole relationships); and the use of a logical strategy. In addition, the Social Adjustment subtest of the Detroit Test of Learning Aptitude (Detroit) was administered in order to obtain additional information related to each subject's social awareness and moral judgment.

The experimenter did not score responses at the time of testing. A tape recorder was used for the duration of each subject's testing to form a more permanent record of responses.

Procedure

Each subject took part in one testing session at the hospital or Center where they previously (or currently) received speech and language therapy. The sessions ranged in length from one hour to two hours and thirty minutes (the
mean length was one hour and forty-five minutes), depending upon the client's speed in completing the tests. The only activities in which there was a time limit, were those specified in the ALPS.

The tasks were placed in approximate order of complexity, although some had to be changed to prevent confusion in the instructions (e.g., the Cardinal-Ordinal Relations task was administered after the Equal Angles task to prevent misunderstanding as to when the subject could measure and when he could not).

The experimenter, a graduate student in speech and language pathology, was the sole examiner. Testing took place at a table in a relatively quiet room with only the examiner and subject present (this was true in all but two cases when a third person was present to check reliability). The examiner was seated opposite the subject, and the tasks were presented one at a time, with the remaining materials out of the direct view of the subject.

Instructions and questions for the tasks (excluding the Social Adjustment subtest of the Detroit) were presented to the subjects in printed form on 5 x 8 index cards and read to the subjects with accompanying gestures. The instructions were read twice when necessary, and the subjects were allowed to read them as many times as they wished. The purpose of the written, oral and gestural modes
was to assure the subject the best possible conditions for his/her comprehension of the instructions.

Scoring

Scoring for the ALPS and the Social Adjustment of the Detroit was accomplished according to the scoring procedures set forth in the administration manuals of those tests. The experimental tasks were scored by a categorical system similar to that used in the original tests. The wording on a few test items was changed to accommodate the age differences of the tests and the subjects (e.g., item #4 of the Social Adjustment subtest was amended from, "You are playing near a place where someone is in bed very sick," to "You are having a party near a place where someone is in bed very sick."). However, these changes were not viewed as significantly different from original stimuli for scoring purposes. All answers were written by the examiner at the time of testing and were taped for later comparison.

Data Analysis

A descriptive analysis was chosen as the best mode for this study. The subjects' data were examined in the following ways:

1. An intra-subject evaluation regarding each subject's performance on the ALPS in comparison with his overall performance on the experimental cognitive tasks.
2. An inter-subject evaluation comparing the data from the ALPS results of all of the subjects with the over-performances on the cognitive tasks (i.e., continuity or patterns of errors and correct answers).

3. Comparison of overall subject patterns with normal development patterns.
CHAPTER IV

RESULTS

Task Presentation

Each of the fourteen experimental cognitive tasks was presented to the client with the examiner's spoken instructions and accompanying gestures. The subject was then allowed to read the written instructions which were left in full view for the duration of the tasks. Three of the tasks included questioning which was also printed on the instructional cards.

Scoring

Although all answers were written down by the examiner during testing, scoring was not attempted at that time. The examiner used each subject's audio tape to complete and, if necessary, correct the test responses. The responses were scored on the basis of the written and taped data.

The diversity of the tasks necessitated a varied amount of total points possible. Three of the tasks were scored as either right (1) or wrong (0). The total possible points for the remaining tasks ranged from two to six. The point system was related to the complexity of the task rather than the skill necessary to complete it. Points were assigned for reasoning and appropriate completion of
each constituent within the task.

The subjects were allowed to change their answers as often as necessary within a task. The final response was the one scored.

Reliability

A reliability check was accomplished by a certified University professor who was present during the testing sessions of two subjects (A.S. and J.M.). Subject responses were written by her at that time and were scored at a later time. Comparison of the cognitive-task scores revealed 100% agreement. The reliability check on the Social Adjustment subtest of the Detroit resulted in agreement 91 percent of the time for J.M. and 86 percent of the time for A.S.

Analysis of The Data

Intra-subject Analysis

An analysis of intra-subject results reveals little relationship between performance on the ALPS and overall performance on the cognitive tasks. Six of the eight subjects successfully completed 50% or less of the tasks. The highest number of points gained on the cognitive tasks were obtained by the remaining two subjects, J.M. and F.D. (only eight of the 14 tasks were passed). Both of these subjects ranged in the mild to insignificant categories on the ALPS (Figures 6 and 7). The highest ALPS score
was obtained by L.S. who was scored as insignificantly impaired in all four areas (listening, talking, reading, and writing). L.S. passed only 6 of the 14 tasks and ranged in the lower half of the group in points (Figures 8a and 8b). The scores of the Social Adjustment subtest of the Detroit were not obviously related to the subjects' levels of functioning on the ALPS or the experimental cognitive tasks.

**Inter-subject Analysis**

Inter-subject data analysis reveals a similar incongruity. Results of the ALPS (Figure 9) support the idea that the majority of the subjects are mildly or insignificantly impaired in all areas (i.e., listening, talking, reading, and writing). One subject (H.F.) was moderate-severely impaired in listening ability. All other subject impairment, which was greater than mild, involved either reading or writing. However, instances of this type were few in number and can be summarized as follows:

1. C.S.'s reading ability was severely impaired and her writing ability was categorized as moderate-severe.
2. L.N. had a mild-moderate impairment in his writing skill.
3. A.S. was categorized as having mild-moderately impaired reading skill.
4. C.K.'s writing was mild-moderately impaired.

**Cognitive Tasks**

Figures 10-23 show the extent to which each of the cognitive tasks was correctly completed. The Equal Angles task, which is representative of the formal operations stage (Burk, 1973), was the only task not appropriately completed by any of the subjects. One to seven people successfully completed the remaining tasks. No single task was completed correctly by all of the subjects. Only four of the tasks were successfully completed by more than 50% of the subjects.

**Social Adjustment Task**

The responses to the Social Adjustment subtest of the Detroit were interesting, though inconclusive. All of the subjects fell short of the total possible points by at least six points (Figure 24). Some of the answers were unmistakeably wrong and some appeared to have no bearing on the question (e.g., H.F. was asked, "What is the thing for you to do if you see a live wire that has fallen in the street?" She replied, "Is it big or small?"). In general, however, the responses to this test appeared to be influenced more by the subjects' ages, attitudes, and experiences rather than by their disabilities.
Discussion

Although the language abilities of the majority of the subjects proved to be mild, their cognitive abilities appeared to be functioning in a depressed manner. This appears to be contrary to the information provided previously in the review of the literature. The difference between the two skills could be due to the selection of the cognitive tasks included, or it could be attributed to the nature of the disorder itself. One argument that could be formulated to reflect the task selection problem would examine the possibility that the tasks were oriented to a greater extent to language than to cognition. However, the fact that the instructions were kept at a basic reading level, and were kept to a minimum, lessens the probability of this being a factor. In addition, an examination of the complexity of the task instructions (see Appendix A) and the completion of the tasks (Figures 10-23) indicates little relationship between the two. Some of the lengthiest and most complex instructions led to better than or equal completion of tasks than less involved instructions. For example, three people successfully completed the Conservation of Area task which contained the largest number of sentences in the written instructions. The fewest sentences were used for the initial Matrix task (A) which was also correctly completed
by three people. Further, there is also little apparent relationship between the extent of the subject's reading impairment and the length or complexity of the instructions. For example, C.S. had a severe reading impairment according to the ALPS and was able to complete two of the tasks which contained the lengthiest instructions (Discontinuous Volume and Ordinal Seriation).

A relationship was also unapparent between the sequence of stages of normal development and the task skill represented by these subjects with acquired language disabilities, with the exception of the failure of all subjects to successfully complete the single formal operations task (Equal Angles). Ordering Seriation, of the preoperations stage (usually acquired around five years of age), was only completed by four of the subjects while two of the Matrices (B and C), which were representative of the concrete operations stage (acquired at approximately eight years of age), were successfully completed by all but one of the eight subjects.
CHAPTER V

SUMMARY AND CONCLUSIONS

Purpose of the Study

The thought-oriented aphasia therapy developed by Wepman (1976) has opened new avenues of investigation to the analysis of acquired language disabilities. Although such studies have shown success, there has been little new research done to indicate the possible implications. This study was designed to provide information concerning the cognitive abilities (as opposed to intelligence quotients) of the adult who acquires a language disability and the relationship of the cognitive and linguistic abilities in the same individual.

Normal Development and Assessment in Adults

The normal developmental sequence was the basis for the cognitive tasks chosen. Successful completion of tasks similar to those used in this study has been observed in children by Piaget and others (Inhelder and Piaget, 1964; Piaget, 1973; Sharp, 1969; and Burk, 1973). Many of the skills represented by these tasks are basic to language acquisition of the young child (Sinclair, 1971).
It seems likely then that the loss of language in adulthood may have some relation to, or be reflective of, a similar loss of cognition. This assumption has been dealt with by Wepman (1968 and 1976) and Goldstein (1948) in therapy and has proven to be of value. Although little investigation of the importance of normal development findings to adult language therapy has been accomplished, there are authors who have supported such research (Taylor and Anderson, 1968). It is important, they warn, to keep in mind the differences between adults and children, in addition to considering the differences between normal and disturbed language. 

Methods and Results

Eight adults who acquired language disorders at least six months prior to this experiment were individually presented with a standardized test of aphasia (ALPS); the Social Adjustment subtest of the Detroit; and a set of fourteen cognitively-based tasks. All of the cognitive tasks were administered in printed form and in spoken form with accompanying gestures. The responses were recorded during testing and verified later through the use of compared audio recordings of the testing procedure with each subject. Scoring of the cognitive tasks was accomplished in a categorical manner. Scoring of the ALPS and the Social Adjustment subtest was accomplished according to the test
manual instructions.

The results were analyzed descriptively through the use of graphs according to three considerations: Intra-subject test relations; inter-subject test relations; and the relationship between normal development and overall test results. Little relationship was found in any of these categories, although there was a definite deficit in cognitive abilities indicated by the scores of all the subjects. Indications of mild or insignificant language impairment in the ALPS did not preclude success on the cognitive tasks. Also no trend of task failure is apparent. In other words, no one general type of test was noted to be in error by most of the subjects.

The difficulty or failure of a task by these subjects did not appear to reflect normal development. Those skills gained initially by a normal developing child were not correctly displayed more often than those that are developed at a later age.

Conclusions and Implications

No direct or obvious patterns were noted within or between the subjects outside of the lack of skills in dealing with the cognitive tasks. If the discrepancy between the responses of the ALPS and the cognitive tasks is not due to the client's lack of comprehension of the instructions, it would seem that the standardized test did not appro-
appropriately test and/or categorize the subjects' language abilities.

On the other hand, perhaps the failures on the cognitive tasks are not representative of the same skills as the subtests of the ALPS. This conclusion does not necessarily imply the cognitive tasks are unrelated to the language of that person. There are many subtle impairments not tested by so-called language tests, which are apparent in conversation. Perhaps this method of assessment dealt only with surface language learning and left the underlying cognition untapped.

The analysis of acquired language disabilities included in this study was general, by design. Even so, there was evidence of a residual deficiency in cognitive analysis in subjects who were assessed as being mildly or insignificantly impaired linguistically.

Based upon the data presented in this study, the experimenter feels that further research of cognitive behaviors in adults with acquired language disabilities would be worthwhile. Additional considerations for the selection of a population could include the following:

1. An ongoing analysis of cognitive abilities in adults who are at an earlier point in the recovery process could provide further information about the importance of cognition to the reacquisition of language.
2. The present study gave no attention to the types of language disability displayed by the subjects. It is possible there was a lack of pattern formation in the data due to this factor. A comparison of populations in relation to the site of cortical lesion or based upon the characteristics of the language disability (e.g., Anomia, dysarthria, etc.) could be beneficial in providing such a pattern.

3. A similar consideration in selection of the population may be the etiology of the language disability. For example, data may reveal a pattern differentiation between victims of cerebral trauma and victims of cerebral vascular accidents.
BIBLIOGRAPHY


APPENDIX A:

The Experimental Cognitive Tasks, Instructions, And Questions in Order of Presentation
I. Ordering Seriation

Materials:
- A pencil
- A set of drawings representing a falling pencil

Procedures and Instructions:

"I am going to drop this pencil. I want you to watch very carefully how it falls. I will do it twice."

The pencil was held by the eraser with the point ½ inch from the table and dropped. This was done twice. The pictures were shuffled and given to the subject.

"Take these pictures of the pencil falling. Put them in the correct order. Start with the way the pencil looked when I was holding it. End with the way it looked when it stopped moving. Use all of the cards."

Scoring: Correct order = 1
Incorrect order = 0

II. Discontinuous Volume

Materials:
- 16 wooden inch cubes

Sky Scraper

Hotel

Motel
Procedures and Instructions:

"Imagine that each of these blocks is a room. I am going to build a motel. I want you to count the rooms and tell me how many there are."

A structure such as the motel shown above was formed and the subject was allowed time to count the rooms.

"Now I will take down the motel and build a hotel."

A structure resembling the hotel pictured above was assembled and the subject was asked the following question:

"Was one building larger than the other or were the number of rooms the same in both of them?"

"I am going to tear down the hotel now and build a sky scraper."

A structure resembling the sky scraper pictured above was assembled, and the subject was asked the following questions:

"Is the sky scraper larger than the hotel was? Is the sky scraper larger than the motel was? Which building do you think had more rooms?"

Scoring:

Counts the number of rooms correctly = 1
Hotel is the same size as motel = 1
Sky scraper is the same size as the other buildings = 1
All buildings have the same amount of rooms = 1

III. Inclusion

Materials:

12 wooden beads; brown and red

Procedures and Instructions:

"What do you think this bead is made of?"

A brown bead is handed to the subject first, and then a red bead is given with a repetition of the above question. When it was agreed that all the beads were wooden the following question was asked:
"Are there more brown beads, or more wooden beads?

IV. Conservation of Area

Materials:

2 wooden boards; green on one side
2 miniature plastic cows
8 miniature wooden barns

Procedure and Instructions:

The two green boards and eight barns were placed in front of the subject one at a time with the following question:

"Are these the same size?"
"Imagine these boards are pastures. I will put a cow in each one. Both animals have the same amount of grass to eat, because both pastures are the same size. There is a fence between so neither cow can get the other one's grass. Now we'll add some barns."

Four of the barns were placed in a group, touching each other, in one corner of one green board. The following question was asked:

"Does one cow have more to eat than the other, or do they both have the same amount to eat? Tell me why you think so. Now we'll add some barns to the other pasture."

Four more barns were placed, in a scattered fashion, on the other green board, and the above question and explanation are repeated.

Scoring:

Agreement to the same size boards = 1
Agreement to the same size barns = 1
First part-one cow has more = 1
Reason = 1
Second part-both cows have the same = 1
Reason = 1

V. Bottles

Materials:

A laminated page containing four drawn bottles
An orange felt-tip marker
Procedure and Instructions:

Attention of the subject is drawn to one bottle where the tester is drawing a horizontal line with the felt-tip pen.

"Look at this bottle. It has juice in it. It has a tight stopper in the top. Draw juice in the other bottles just like it would be if they were sitting on a shelf that way.

Scoring:

No discernible pattern = 0
Juice follows a diagonal, but not necessarily horizontal = 1
Juice consistently horizontal = 2

VI. Null Inclusion

Materials:

Deck of cards consisting of: 4 pictures of objects; 4 pictures of people; and 4 blanks

Procedure and Instructions:

"Put all of these cards into two (2) groups that seem right to you."

Scoring:

No discernible pattern = 0
3 classes: People/blanks/objects = 1
Blanks mixed in with people and/or objects = 1
Blanks and pictures = 2
VII. **Equal Angles**

Materials:

- Paper (folded in half)
- Pencil
- Ruler
- Compass

Procedure and Instructions:

Examiner used pencil and ruler to draw an angle on one side of the folded paper. The paper and instruments were handed to the subject with these instructions:

"Draw one just like mine. You may use any of these tools. You may look at mine as often as you want. You may *not* trace, and you may *not* look at mine while you draw."

When the subject completed the angle, the same procedure and instructions were followed for drawing a triangle.

![Equal Angles Diagram](image)

Scoring:

- Completion of similar structures = 1
- Use of the ruler to measure = 1
- Use of the compass = 1

VIII. **Cardinal-Ordinal Relations**

Materials:

- 8 straws of varying lengths

Procedure and Instructions:

"Put all of these straws in order like a staircase. (Pause) Give me all of the straws that this second straw (pointed to) would cover an even number of times. Don't measure! (Pause) Now give me the
straws that this third straw (pointed to) would cover an even number of times."

Scoring:

Forms a staircase = 1
2nd straw: 4, 6, 8 = 3
3rd straw: 6 = 1

IX. Intersection

Materials:

A laminated intersectional matrix showing cats in the horizontal direction and blue objects in the vertical direction. Individual pictures of blue objects, cats, and unrelated objects.

Procedure and Instructions:

"Find the picture that best fits in this space."

Scoring:

Choice of a cat = 1
Choice of a blue object = 1
Choice of a blue cat = 2
X. **Matrices A, B, C, D**

**Materials:**

- Laminated Matrices (as shown below)
- Sets of individual pictures used as possible choices

![Diagram of matrices and pictures](image-url)
Procedure and Instructions:

"Find the picture that best fits in this space."

Scoring:

Matrice A - Color = 1
Shape = 1

Matrice B - Color = 1
Shape = 1

Matrice C - Color = 1
Object = 1

Matrice D - Color = 1
Object = 1
Direction = 1
XI. **Egocentrism**

**Materials:**
- Coffee cup
- Box of kleenex
- Photographs (black and white) of the cup and box together in different positions.

**Procedures and Instructions:**

The cup and box were placed between the examiner and subject with the cup to the examiner's left (handle facing outward) and the box directly to the left of the cup.

"Look at the cup and box. Find the picture that shows how they look from my side of the table."

**Scoring:**

- Correct choice = 1
- Incorrect choice = 1
Insignificant
Mild
Mild-Moderate
Moderate-Severe
Severe
Profound

Figure 1a. Levels of Performance Achieved by C.S. on the ALPS on the Subtests of Listening, Talking, Reading, and Writing.
x___x = total possible points
0----0 = total points achieved by the subject

Figure 1b. A Comparison of Total Points Possible and Total Points Achieved by C.S. on Each of the Cognitive Tasks.
Figure 2a. Levels of Performance Achieved by H.F. on the ALPS on the Subtests of Listening, Talking, Reading, and Writing.
Figure 2b. A Comparison of Total Points Possible and Total Points Achieved by H.F. on Each of the Cognitive Tasks.
Figure 3a. Levels of Performance Achieved by L.N. on the ALPS on the Subtests of Listening, Talking, Reading, and Writing.
Figure 3b. A Comparison of Total Points Possible and Total Points Achieved by L.N. on Each of the Cognitive Tasks.
Figure 4a. Levels of Performance Achieved by A.S. on the ALPS on the Subtests of Listening, Talking, Reading, and Writing.
Figure 4b. A Comparison of Total Points Possible and Total Points Achieved by A.S. on Each of the Cognitive Tasks.
Figure 5a. Levels of Performance Achieved by C.K. on the ALPS on the Subtests of Listening, Talking, Reading, and Writing.
Figure 5b. A Comparison of Total Points Possible and Total Points Achieved by C.K. on Each of the Cognitive Tasks.
Figure 6a. Levels of Performance Achieved by F.D. on the ALPS on the Subtests of Listening, Talking, Reading, and Writing.
Figure 6b. A Comparison of Total Points Possible and Total Points Achieved by F.D. on Each of the Cognitive Tasks.
Figure 7a. Levels of Performance Achieved by J.M. on the ALPS on the Subtests of Listening, Talking, Reading, and Writing.
Figure 7b. A Comparison of Total Points Possible and Total Points Achieved by J.M. on Each of the Cognitive Tasks.
Figure 8a. Levels of Performance Achieved by L.S. on the ALPS on the Subtests of Listening, Talking, Reading, and Writing.
Figure 8b. A Comparison of Total Points Possible and Total Points Achieved by L.S. on Each of the Cognitive Tasks.
Figure 9. Listening, Talking, Reading, and Writing Results of the Aphasia Language Performance Scale for all of the Subjects.
Figure 10. Total Points Achieved by Each Subject on the Ordering Seriation Task.

Figure 11. Total Points Achieved by Each Subject on the Discontinuous Volume Task.
Figure 12. Total Points Achieved by Each Subject on the Inclusion Task.

Figure 13. Total Points Achieved by Each Subject on the Conservation of Area Task.
Figure 14. Total Points Achieved by Each Subject on the Bottles Task.

Figure 15. Total Points Achieved by Each Subject on the Null Inclusion Task.
Figure 16. Total Points Achieved by Each Subject on the Equal Angles Task.

Figure 17. Total Points Achieved by Each Subject on the Cardinal-Ordinal Relations Task.
Figure 18. Total Points Achieved by Each Subject on the Intersection Task.

Figure 19. Total Points Achieved by Each Subject on the Matrix A Task.
Figure 20. Total Points Achieved by Each Subject on the Matrix B Task.

Figure 21. Total Points Achieved by Each Subject on the Matrix C Task.
Figure 22. Total Points Achieved by Each Subject on the Matrix D Task.

Figure 23. Total Points Achieved by Each Subject on the Egocentrism Task.
Figure 24. Raw Scores Obtained by Each Subject on the Social Adjustment (A) Subtest of the Detroit Tests of Learning Aptitude.