THE HIDDEN LANGUAGE DISORDERED CHILD

A THESIS

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE OF MASTER OF ARTS

IN THE GRADUATE SCHOOL OF THE

TEXAS WOMAN'S UNIVERSITY

INSTITUTE OF HEALTH SCIENCES

SCHOOL OF HEALTH CARE SERVICES

DEPARTMENT OF COMMUNICATION SCIENCES

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DENTON, TEXAS

DECEMBER 1987

TEXAS WOMAN'S UNIVERSITY
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November 9, 1987

To the Provost of the Graduate School:

I am submitting herewith a thesis written by Michelle Mizell Herzer entitled "The Hidden Language Disordered Child." I have examined the final copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Arts, with a major in Speech-Language Pathology.

Delaina Walker Gotcher
Major Professor

We have read this thesis and recommend its acceptance:

Delaina Walker Gotcher

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Accepted

Leslie M. Thompson
Provost of the Graduate School

DEDICATION

I wish to dedicate this thesis to my loving husband, Frederick who has made my life complete. Happy Thirtieth Birthday!

ACKNOWLEDGMENTS

I would like to thank the members of my research committee, Dr. Delaina Walker-Batson, Dr. Dorothy Grant, and Mrs. Mary Dobson for providing me with a wonderful experience throughout graduate school. I would like to extend my gratitude to....

Dr. Delaina Walker-Batson, for her continual support, enthusiasm, kindness, and friendship from Language Disorders Class through this thesis....

Dr. Dorothy Grant, for her patience, serenity, and belief that this could be done....

Mrs. Mary Dobson, for her clinical expertise and guidance in helping me believe in myself....

The Garland Independent School District, the faculty and staff at Bradfield Elementary School, my principal, Mr. William K. Gossett, and my students who supported me throughout this study....

The subjects and their parents for making this study possible. The actual testing of these young men was a very enjoyable experience, their enthusiasm and positive attitudes are to be commended....

My special friend, Connie Spence, for her friendship, words of encouragement, and understanding that carried me

through this project....

My dear parents, Leo and Muriel Mizell for providing me with a loving and nurturing childhood and for their continuous love, support, and encouragement ....

My brothers, Michael and William Mizell (whom I am so proud of) for being there from ballet recitals on....

My sister-in-law Kim, for understanding and listening and listening....

My mother and father-in-law Mary Ann and Joe Herzer, brothers-in-law Greg and Joe, sister-in-law Martha, and niece Ashley, for their words of encouragement, patience, and understanding....

Most importantly, my God for pulling at my heartstrings to do this study and making it all possible.

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December 1987

In an effort to assess language processing in a small sample of slow learning children, a detailed language battery used previously with dyslexic and learning disabled children (Denckla, 1977) was administered to five slow learning boys enrolled in the Garland Independent School District's Alternative for Individual Needs of Students (GAINS) Program, Garland, Texas. The questions explored were: (a) Do slow learners enrolled in the GAINS Program have underlying specific language deficits as determined by a comprehensive language battery? and (b) If slow learners have specific language deficits do they fall into subgroups found previously (Denckla, 1977) in dyslexic children?

The data was handled descriptively. Results indicated that three of the five subjects appeared to have a language deficit as measured by the language battery augmented for

the purposes of this study. The two subjects that did not appear to have a language deficit were previously enrolled in Resource Classes, unlike the three who showed a language deficit.

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER I

INTRODUCTION

DeHaan and Kough (1956) define a slow learner as "a child whose mental ability is high enough to justify keeping him in the regular classroom but low enough to give him considerable difficulty in keeping up with the average speed of the regular class" (p. 152). Slow learners will generally have an intelligence quotient between 70 and 89 (Frain, 1956). The application of the term "slow learner" is often used to describe all levels of academic underachievement, however there is general agreement that these children comprise 15 to 20 percent of the total school population (Abraham, 1964). Terms such as the following are often used to describe the slow learning child; borderline retarded, low normal, and dull normal (Abraham, 1964).

Passage of Public Law (PL) 94-142 in 1975 granted free and appropriate education to all handicapped students as part of their constitutional rights. To receive special services under this law, a child must meet specific eligibility requirements listed under each handicapping condition. PL 94-142 does not provide a classification for the slow learner. The two most related handicapping

conditions appear to be learning disabilities and mental retardation (Mueller, 1983).

Statement of the Problem

Approximately 15 to 20 percent of the public school population has an I.Q. between 70 and 89 and subsequently are classified as slow learners. Due to changes in educational guidelines these children do not "qualify" for special education. These children routinely experience failure in the regular classroom and do not perform tasks as easily as their peers. They are cognizant that their learning style is slow and different yet they are kept in the mainstream with modified curriculum and placed from grade to grade. Because of their consistent failure many slow learners drop out of school and it has been suggested that these factors contribute to the development of juvenile delinquency (Jacobson, 1974). Problems in language processing, both oral and written, have not been studied to a great extent in this population although evidence points to this as a possibility (Abraham, 1964; ASHA, 1982; Naremore & Dever, 1975; Silva, McGee & Williams, 1983; & Younie, 1974). Children with language disorders are at high risk for varying degrees and types of failure as language is a necessary skill for success in academic, social, and emotional development (ASHA, 1982). Speech-Language Pathologists are aware of the difficulties

that many children with language impairments encounter when learning to read. In addition, some children with language problems may experience difficulties when dealing with mathematics, as language is a vehicle for learning the code of mathematics (Andrews & Brabson, 1977).

Statement of the Purpose

The purpose of this study was to provide data on language processing in a small sample of slow learning children with a Full Scale Intelligence Quotient between 70 and 89. By administering a detailed battery of language tests used previously with dyslexic and learning disabled subjects (Denckla, 1977) this study will attempt to determine if a subset of slow learning children may have a specific deficit in language processing. More specifically, this study sought to determine if there was a significant discrepancy between language processing and nonverbal intellectual potential in one or more of the areas of receptive and expressive language, receptive vocabulary, auditory phoneme perception, visual-spatial problem solving abilities, sentence repetition, rapid automatic naming ability, phonemic segmentation, and written language. The battery of language tests (Denckla, 1977) which was augmented for the purposes of this study was administered to five slow learning children enrolled in the Garland Independent School District's Alternative for

Individual Needs of Students (GAINS) Program.

Research Questions

Answers to the following questions were determined through this study: (a) Do slow learners enrolled in the GAINS program have underlying specific language deficits as determined by a comprehensive language battery? and (b) If slow learners have specific language deficits do they fall into subgroups found previously (Denckla, 1977) in dyslexic children?

Definition of Terms

For the purpose of this study, the following terms are defined as follows:

1. Slow Learners. A population with a diagnosed intelligence quotient between 70 and 89 (Frain, 1956).

2. Specific Learning Disability. A disorder in one or more of the basic psychological proceses involved in understanding or in using language, spoken or written, which may manifest itself in an imperfect ability to listen, think, speak, read, write, spell, or to do mathematical calculation. The term includes such conditions as perceptual handicaps, brain injury, minimal brain disfunction, dyslexia, and developmental aphasia. The term does not include children who have learning problems which are primarily the result of visual, hearing, or motor handicaps, of mental retardation, of emotional

disturbance, or of environmental, cultural, or economic disadvantage (LSHSS, 1981, p. 132).

3. Learning Disabled Student. A student who has been determined by a multidisciplinary assessment team to have a significant discrepancy between academic achievement and intellectual abilities in one or more of the areas of oral expression, listening comprehension, written expression, basic reading skills, reading comprehension, mathematics calculation, mathematics reasoning, or spelling (Texas Education Agency, 1986).

4. Mentally Retarded Student. A student who has been determined by a licensed or certified psychologist, a psychological associate, or an educational diagnostician to be functioning two or more standard deviations below the mean on individually administered scales of verbal ability, performance or non-verbal ability, existing concurrently with deficits in adaptive behavior (Texas Education Agency, 1986).

5. Garland's Alternative for Individual Needs of Students (GAINS) Program. A special remedial category in which students that meet specific guidelines are mainstreamed in regular classes and are placed, not promoted, to the next grade level due to achievement at their maximum ability (Texas Administrative Code, Section 75.195, 1985).

6. Language. Language is a complex and dynamic system of conventional symbols that is used in various modes for thought and communication. Contemporary views of human language hold that (a) language evolves within specific historical, social, and cultural contexts, (b) language, as rule governed behavior, is described by at least five parameters, phonologic, morphologic, syntactic, semantic, and pragmatic, (c) language learning and use are determined by the interaction of biological, cognitive, psychosocial, and environmental factors, and (d) effective use of language for communication requires a broad understanding of human interaction including such associated factors as nonverbal cues, motivation, and sociocultural roles (American Speech-Language-Hearing Association, 1983).

7. Language Disorder. The impairment or deviant development of comprehension and/or use of a spoken, written, and/or other symbol system. The disorder may involve (a) the form of language (phonologic, morphologic, and syntactic systems), (b) the content of language (semantic system), and/or (c) the function of language in communication (pragmatic system) in any combination (American Speech-Language-Hearing Association, 1982).

8. Dyslexia. The inability to derive meaning from a string of printed symbols (Kamhi & Catts, 1986). The two major types are called "acquired" and "developmental"

dyslexia.

Limitations

Generalizations of the results of this investigation to a larger population of slow learners must be guarded due to the small sample investigated. Because this was a small study involving only five subjects, the findings may not be indicative of the general population of slow learners.

Significance of Study

There is a lack of studies which have assessed the slow learning population. Therefore, data obtained from this study could prove useful in determining if a subset of slow learners exists that have a specific language deficit. Many authors suggest that slow learners need additional educational assistance, however, there is little evidence to support these assumptions (Featherstone, 1951; Younie, 1974). Younie (1974) states, " The research results that are available are frequently inconclusive because subjects are poorly defined, defined in widely different terms, or not defined at all" (p. 55). Documentation is needed to challenge the current educational guidelines which may be leaving these children out of special classes, setting them up for failure, and providing them with few choices in their lives.

Summary

Slow learning is a complex problem that affects

approximately 15 to 20 percent of the total school population. Differences in potential level arise from a variety of causes. Learning problems created by these different causes must be treated in different ways (Younie, 1979, p. 23). The major objective of this study was to closely analyze, compare, and describe results obtained from a detailed language battery administered individually to five male slow learning students enrolled in the Garland Independent School District's Alternative for Individual Needs of Students (GAINS) Program.

CHAPTER II

REVIEW OF LITERATURE

Slow learning children are much more numerous in our schools than are the physically handicapped, yet they receive little special attention (Gaddis, 1971). DeHaan and Kough (1956) define a slow learner as "a child whose mental ability is high enough to justify keeping him in the regular classroom but low enough to give him considerable difficulty in keeping up with the average speed of the class" (p. 152). Slow learners will generally have an intelligence quotient between 70 and 89 (Frain, 1956). The application of the term "slow learner" is often used to describe all levels of academic underachievement, however there is general agreement that these children comprise 15 to 20 percent of the total school population (Abraham, 1964). Terms such as the following are often used to describe the slow learning child; borderline retarded, low normal, and dull normal (Abraham, 1964). This literature review will: (a) present characteristics of the slow learning child, (b) define specific learning disability, learning disabled students, mentally retarded students, and the Garland Alternative for Individual Needs of Students (GAINS) Program, (c) describe language as a base for

academic achievement, (d) discuss the importance of language for reading, and (e) summarize issues affecting the slow learner.

Slow Learners

Slow learners have a reduced ability to make abstractions. They often act upon information that is immediately available without recognizing its present or future implications. Slow learners find it is difficult to learn from material lacking familiar elements even though the content includes many clues to ideas previously mastered. They have difficulty questioning ideas and situations because of an impaired ability to discover the existing gaps in their own knowledge and they have difficulty in constructing an overall conclusion from smaller pieces of information (Younie, 1974).

Abraham (1964) lists the following frequently cited comparisons of slow learners to children considered intellectually normal: (a) short attention and interest span, (b) limited imagination and creative thinking, (c) slow reaction time, (d) academic retardation, especially in reading, (e) absence or easy loss of self-confidence, (f) gullibility, shyness, submissiveness, (g) low power of retention, memory, and concentration, (h) inability to do abstract thinking and to handle symbols, and (i) low levels of vocabulary, reasoning, defining, discriminating, and

analyzing (p. 18).

Slow learning children have the same basic needs for acceptance and belonging as all children, however, the slow learner may begin to feel left out of the total group because of his or her lack of academic achievement (Meyer, 1976). Because of the slow learner's failure in academic subjects the schools are left with few options. Retention does not reduce the complexity of the academic material assigned and promotion leads to increased frustrations for the slow learners because of their lack of comprehension and knowledge. These inappropriate solutions may result in frustrating the slow learner therefore these children may react by withdrawing or by becoming aggressive. If the child withdraws his or her needs may be completely ignored while aggressive behavior may lead to increased alienation and social problems, such as juvenile delinquency (Meyer, 1976; Zincus & Gottlieb, 1978). Due to the fact that the options currently available for the slow learner are not appropriate, it seems obvious that these children need some type of educational assistance.

Passage of Public Law (PL) 94-142 in 1975 granted free and appropriate education to all handicapped students as part of their constitutional rights. To receive special services under this law, a child must meet specific eligibility requirements listed under each handicapping

condition. PL 94-142 does not provide a classification for the slow learner (Mueller, 1983). Prior to 1973, children who were in the borderline mental retardation range (I.Q. ranging from 68 to 84) could receive special education services (Luick & Senf, 1979). However, the revised classification system of mental retardation in 1973 deleted this borderline category and instituted a more detailed adaptive behavior index to be considered in conjunction with the child's I.Q. leaving the slow learners without extra educational assistance (Grossman, 1973). The handicapping conditions that appear to be related closest to slow learning are learning disabilities and mental retardation.

Definitions

The First Annual Report of the National Advisory Committee on Handicapped Children (1967) developed a definition of learning disabilities, a definition that is quoted widely and is included in PL 94-142:

> "Specific learning disability" means a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, which may manifest itself in an imperfect ability to listen, think, speak, read, write, spell, or to do mathematical calculations. The term includes such conditions as perceptual handicaps, brain injury,

> minimal brain dysfunction, dyslexia, and developmental aphasia. The term does not include children who have learning problems which are primarily the result of visual, hearing, or motor handicaps, of mental retardation, of emotional disturbance, or of environmental, cultural, or economic disadvantage (LSHSS, 1981, p. 132).

In order to differentiate between learning disabled students and mentally retarded students, the State Board of Education Rules for Handicapped Students (1986) addresses the definitions as follows:

> A learning disabled student is a student who has been determined by a multidisciplinary assessment team to have a significant discrepancy between academic achievement and intellectual abilities in one or more of the areas of oral expression, listening comprehension, written expression, basic reading skills, reading comprehension, mathematics calculation, mathematics reasoning, or spelling. The multidisciplinary assessment team shall determine that the discrepancy is not primarily the result of visual handicap, hearing impairment, mental retardation, emotional disturbance, or environmental, cultural, or economic disadvantage and for whom the inherent disability exists to a degree such that they cannot be

adequately served in the regular classes of the public schools without the provision of special services other than those provided under compensatory education programs. The team shall determine the student's intellectual ability based on standardized intelligence tests, and shall determine the student's achievement level based on standardized achievement tests in areas in which the student has had appropriate learning experiences. The two sets of standardized scores shall be compared. The team shall find that a severe discrepancy exists when the student's assessed intellectual ability is above the mentally retarded range, but where the student's assessed educational achievement in areas specified is more than one standard deviation below the student's intellectual ability. The team's report shall include a statement of the degree of discrepancy and the method of computation used in determining the severe discrepancy (p. 97). When a student's educational performance is consistent with the student's assessed intellectual ability, the student shall not be eligible to be classified or served as learning disabled (p. 97).

A mentally retarded student is a student who has been determined by a licensed or certified psychologist, a psychological associate, or an educational

> diagnostician to be functioning two or more standard deviations below the mean on individually administered scales of verbal ability, performance, or nonverbal ability, existing concurrently with deficits in adaptive behavior. The report of individual assessment must specify the degree of mental retardation. If mental retardation is suspected, assessment instruments must be selected from the list of instruments approved by the State Board of Education (p. 5).

The Garland Alternative for Individual Needs of Students (GAINS) Program has been developed for students who meet the eligibility criteria according to state and local guidelines. Students who are eligible for this program must have an I.Q. between 70 and 89 or must be limited in their English proficiency. Students are mainstreamed in regular classes using modified curriculum and are advanced to the next grade based upon performance compared to their ability level.

Language as a Base for Academic Achievement

Because language underlies the major portion of academic learning and is the primary means through which curriculum is presented, it is crucial that a multidisciplinary team of professionals be aware of the variety of language interactions that take place in a specific learning task during an instructional day. Public

education assumes that a child enters school with an intact oral language system. The design and formulation of the school curriculum is based on the same assumption without regard for the central role of language in learning academic content areas. Children with language disorders are at high risk for academic failure of varying degrees and types as language is a necessary skill for success in academic, social, and emotional development (ASHA, 1982, p. 941).

Speech-Language Pathologists are aware of the difficulties that many children with language impairments encounter when learning to read. Reading is based on the ability to obtain meaning from a structured system of written symbols that are used to represent oral language. Thus, oral language is a basis for written language (Bangs, 1968). In addition, some children with language problems may experience difficulties when dealing with mathematics, as language is a vehicle for learning the code of mathematics (Andrews & Brabson, 1977).

Silva, McGee and Williams (1983) studied the prevalence and effects of early language delay of 1,027 children from three to seven years of age. The sample children were being followed longitudinally by the Dunedin Multidisciplinary Health and Development Research Unit (Silva, 1980). Each child was assessed within

approximately one month of his or her third, fifth, and seventh birthdays by trained psychometrists. The Reynell (1969) Developmental Language Scales were used at ages three and five. Language was assessed at age seven by means of the Auditory Reception and Verbal Expression subtests of the Illinois Test of Psycholinguistic Abilities (Kirk, 1968). Intelligence was assessed at age seven with the Wechsler Intelligence Scale for Children-Revised (Wechsler, 1974). Reading was assessed by the Burt Word Reading Test (Scottish Council for Research in Education, 1976). Children who scored at or below the fifth percentile on only the comprehension or expressive scales at any of the three ages were designated as having a "specific comprehension delay" or "specific expression delay." Children with these scores on both comprehension and expression scales at any age were considered to have "general language delay." "General language delays" at any age were associated with a highest prevalence of later problems. Sixty percent of these children with "general language delay" (difficulties in both expressive and receptive language) between the ages of 3 and 7, had a low Full Scale I.Q. or reading difficulties at age seven. Most of these children had a low Verbal I.Q. in comparison to their Performance I.Q.. This suggests that in the children with "general language delays" their deficit was verbal

rather than global. Therefore, these children may be penalized by the verbal nature of an intellectual assessment which would reflect their verbal deficit rather than their overall level of functioning.

Importance of Language for Reading

One specific deficiency in reading is defined as developmental dyslexia (Kamhi & Catts, 1986). Benton (1978) postulated that developmental dyslexia is often viewed as a more specific form of a broader developmental language disability. Dyslexic children have poor abilities in naming, speech discrimination, syntactic development, short term memory, and poor reasoning abilities. Benton (1978), Velluntino (1978), and Denckla (1977) all reported that speech and language difficulties are a frequent finding in dyslexic children, especially those children with lower verbal scores on the WISC-R and those with poor language skills at the kindergarten level.

Denckla (1977) attempted to define specific subgroups or syndromes of heterogeneous dyslexic children. In Denckla's original study of 52 dyslexic and language-learning disabled children between the ages of 7 and 14, she found the following syndromes or subgroups (a) Language Disorder Subgroup, (b) Articulatory-Graphomotor Subgroup, (c) Visuo-Spatial Subgroup, and (d) Verbal Memorization Learning Disorder Subgroup. The most

frequently occurring syndrome was the language disorder subgroup which comprised sixty percent of the subjects in this study. Denckla further divided the language disorder subgroup into smaller, more specific subcategories. The subcategories included the following: (a) mixed, which consisted of children who had below normal naming abilities, poor repetition skills, poor comprehension, and disturbed, or modified receptive and phonemic memory/sequencing skills, (b) anomic, which included children who were behind on at least two Rapid Automatic Naming (RAN) tasks, and who were at least one standard deviation below age level on the Oldfield-Wingfield Object Naming Battery (1965), but who had normal comprehension and were able to complete at least one repetition task (Stanford-Binet Sentence Repetition, 1960) or, anomic plus repetition disorder if the latter criteria was not met, and (c) dysphonemic sequencing disorder, which included children with poor repetition scores characterized by phonemic substitutions and mis-sequencings and, despite normal Oldfield-Wingfield naming scores, their errors were phonemic and sequential (e.g., "shoehorse" was the most typical response to picture of horseshoe) but comprehension and speech sound production (articulation) were normal.

The second major subgroup or syndrome designated by Denckla was the articulatory-graphomotor disorder, this

subgroup comprised twelve percent of the subjects in this study. Denckla observed that the children in this subgroup had normal receptive language and naming scores but they had motor coordination problems which caused a deficit in their ability to perform motor actions required for writing, drawing, and articulation. The third major syndrome or subgroup which made up four percent of the subjects in this study was the visual-spatial perceptual disorder. Children with this syndrome had characteristics of visual memory problems and difficulty with visual discrimination. These children exhibited characteristics of a Verbal I.Q. more than 10 points higher than their Performance I.Q.. Their Benton Test of Visual Retention scores occurred at or below the borderline level and their Raven's percentile was found to be below their Performance IQ percentile.

In addition to these subgroups or syndromes, Denckla designated a fourth category of verbal memorization learning disorder, this subgroup comprised 10 percent of the subjects in this study. The patients in this category had poor sentence repetition and poor verbal paired associate learning, otherwise, language was not affected.

Summary

Slow learners, as other children, need a balance between success and failure, recognition of abilities and

problems, and help that every child needs in establishing worthwhile, realistic goals (Abraham, 1964). Differences in potential level arise from a variety of causes and the learning problems created by these different causes must be treated in different ways (Younie, 1974, p. 23). Whatever causes verbal language deficiencies, the slow learner with an apparent verbal deficit should receive school instruction based on strengthening their language development (Younie, 1974).

The literature that is currently available on slow learners is not well defined and much that is found is based on various authors opinions rather than empirical data (Meyers, 1976; Younie, 1974). The causes of slow learning appear to be only speculative at the present time (Younie, 1974). In 1956, Bolzau and Keltz wrote the following article "What Shall We Do for the Slow Learner?", it seems rather ironic that this question has gone unanswered for so long.

With the passage of PL 94-142 which has helped so many children, slow learners began slipping through the cracks. Although they appear to overlap the learning disabled and mentally retarded population, they simply do not fit into either category. One author has suggested that they are being penalized because a language disorder may be pulling down their Full Scale I.Q. (Younie, 1974).

One large study looked at predictors of reading achievement between ages three and seven. Sixty percent of the sample who had low language skills at age three years also had low reading levels at age seven. This highlights the importance of expressive and receptive language that are needed for reading achievement. Reading underachievement has numerous causes, one specific cause is found in a group with developmental dyslexia. This specific form of reading disability is known to have an interrelation between language abilities and reading abilities. Because the dyslexics are a heterogeneous group of disorders Denckla (1977), has defined subgroups within the dyslexic population and has developed a battery that has proven to differentiate clinical subgroups: (a) Language Disorder, (b) Articulatory-Graphomotor, (c) Visuo-Spatial, or (d) Verbal Memorization Learning Disorder.

Because it has been said that slow learners may be penalized due to an underlying language disorder a study is needed which carefully assesses the language processing abilities of the slow learning child.

CHAPTER III

METHODOLOGY

The purpose of this study was to provide data on language processing utilizing a small sample of slow learning children with a Full Scale Intelligence Quotient between 70 and 89, by administering a detailed battery of language tests used previously with dyslexic and learning disabled subjects (Denckla, 1977). This study sought to determine if there was a significant discrepancy between language processing and nonverbal intellectual potential in one or more of the areas of receptive and expressive language, receptive vocabulary, auditory phoneme perception, visual-spatial problem solving abilities, sentence repetition, rapid automatic naming ability, phonemic segmentation, and written language. A battery of language tests developed for use with learning disabled children (Denckla, 1977) was augmented for the purposes of this study. This battery was administered to five male slow learning children enrolled in the Garland Independent School District's Alternative for Individual Needs of Students (GAINS) Program. The study was descriptive in nature and was designed primarily to identify if specific language deficits exist in this small sample of slow

learners.

Population and Sample

All of the subjects participating in this study were selected from the Garland Independent School District's Alternative for Individual Needs of Students (GAINS) Program, Garland, Texas. Approval was granted from the Garland Independent School District to perform the study. Written permission for participation in the study was obtained from the parents of each subject.

The five subjects, identified as subjects 1, 2, 3, 4, and 5, selected for participation in this study were male, monolingual, between the age of 10 and 12 years, and were from lower-middle to upper-middle socioeconomic environments (Warner, Meeker & Eells, 1960). Each subject was required to have a minimum Performance I.Q. of 87 as measured by the Wechsler Intelligence Scale for Children-Revised (Wechsler, 1974). All subjects were administered the following assessment measures: (a) the Raven's Coloured Progressive Matrices - Sets A, Ab, B (Raven, 1956), (b) the Lindamood Auditory Conceptualization Test (Lindamood & Lindamood, 1979), (c) the Peabody Picture Vocabulary Test - Revised (Dunn and Dunn, 1981), (d) the Test of Language Development - Intermediate (Hammill & Newcomer, 1982), (e) the Sentence Repetition Subtest of the Stanford-Binet Intelligence Scale

(Terman and Merrill, 1960), (f) the Rapid Automatic Naming Tasks (Denckla & Rudel, 1974), (g) the Assessment and Analysis of Handedness: Edinburgh Inventory (Oldfield, 1971), (h) the Phonemic Segmentation Tasks (Lundberg, Olofsson & Wall, 1980), and (i) the Hunt written language samples (Hunt, 1970).

In addition, all subjects were required to pass audiological screening administered at 25 dB hearing level and show no evidence of a visual, hearing, or orthopedic handicap, mental retardation, emotional disturbance, or environmental, cultural, or economic disadvantage.

Protection of Human Subjects

The current rules and regulations of the Human Research Review Committee at the Texas Woman's University were followed. In compliance with these rules and regulations, application to the Human Subjects Review Committee was made and approved for all subjects selected for this study. The subject's names and other identifying characteristics were not used so all test results were considered confidential.

Setting

The subjects for this study were tested individually in a quiet carpeted classroom at their local elementary school in Garland, Texas. Each testing session was approximately three hours in length, breaks were provided upon subject's request. All tests, except the Wechsler Intelligence Scale

for Children-Revised (WISC-R) and the Woodcock-Johnson Psycho-Educational Battery (WJ), were administered by the researcher. The WISC-R and WJ were previously given by a qualified educational diagnostician in the Garland Independent School District.

Instruments

The descriptive battery of tests included the following: (a) the Wechsler Intelligence Scale for Children-Revised (Wechsler, 1974), (b) Woodcock-Johnson Psycho-Educational Battery (Woodcock and Johnson, 1977), (c) the Test of Language Development- Intermediate (Hammill & Newcomer, 1982), (d) the Peabody Picture Vocabulary Test-Revised (Dunn & Dunn, 1981), (e) the Lindamood Auditory Conceptualization Test (Lindamood & Lindamood, 1979), (f) the Raven's Coloured Progressive Matrices - Sets A, Ab, B (Raven, 1956), (g) the Sentence Repetition Subtest of the Stanford-Binet Intelligence Scale (Terman and Merrill, 1960), (h) the Assessment and Analysis of Handedness: Edinburgh Inventory (Oldfield, 1971), (i) Rapid Automatic Naming (Denckla & Rudel, 1974), (j) Phonemic Segmentation (Lundberg, Olofsson & Wall, 1980), and (k) Written Language Samples (Hunt, 1970).

The following descriptions provide a general overview of the formal and informal assessment measures that were given to the subjects in this study. This overview includes

a general description of each instrument and information regarding its standardization. In addition, a summarizing statement is provided concerning the validity and reliability of each instrument.

Formal Assessment Instruments

Wechsler Intelligence Scale for Children-Revised (WISC-R) Description and Standardization. The Wechsler Intelligence Scale for Children-Revised was designed by David Wechsler (1974) as a general intelligence test. It consists of 12 subtests, six on the Verbal scale and six on the Performance scale. The WISC-R is designed for the use with children in the age range of 6 to 16.

The WISC-R was standardized on a group of 2,200 children. The sample included 200 children from each of the eleven age groups ranging in age from 6 years, 6 months to 16 years, 6 months. The sample included 100 boys and 100 girls from each age level.

Validity and Reliability. Split-half reliability coefficients for the individual tests and the Verbal, Performance, and Full Scale I.Q.'s were obtained. The coefficients were established for six age groups with about 50 children in each group. The results revealed high reliability across all age ranges. The average coefficients were .94, .90, and .96. The coefficients for the individual tests ranged from .77 to .86 for the Verbal

tests, and from .70 to .85 for the Performance test. To test the stability of the twelve individual tests over time, 303 children (245 white and 58 non-white) were selected from the six age groups in the standardized sample and were re-tested after a time period of one month. Three re-test groups were formed by combining several of the groups together. The results were three groups ages 6 1/2 - 7 1/2, 10 1/2 - 11 1/2, and 14 1/2 - 15 1/2. The coefficients were found to be similar to the first sample. Additionally, the WISC-R was found to have high correlations with other intelligence tests.

Woodcock-Johnson Psycho-Educational Battery (WJ) Description and Standardization. The Woodcock-Johnson Psycho-Educational Battery is a test that provides standard measures of cognitive abilities, scholastic aptitudes, language proficiency, achievement, interests, and adaptive behaviors (Woodcock & Johnson, 1977). The assessment tool consists of three main parts. Part One includes twelve cognitive ability subtests that range in difficulty and include such tasks as; visual matching, auditory blending, concept formation, and analogies. Subtest scores on this section provide information on: (a) broad cognitive ability, (b) special cognitive abilities, and (c) scholastic aptitude. Part Two contains ten subtests that measure various aspects of scholastic achievement. Scores

from these subtests provide information related to reading, mathematics, and written language skills as well as a measure of the knowledge of academic areas such an social studies, science and humanities. Part Three can be used to evaluate an individual's level of interests in various scholastic and nonscholastic activities. The WJ was standardized on 4,732 subjects ranging from school age to adult.

Validity and Reliability. The test scores for all of the subjects tested in the norming sample were used in the calculation of the reliability statistics for each of the subtests. Each subtest except for 2, 4, 7, 9, and 11 had reliabilities calculated by using the split-half procedure. The odd and even scores on each subtest were used in the split-half coefficient calculations. All of the split-half coefficients were corrected for the various lengths of tests using the Spearman-Brown correction formula. Due to the fact that subtests 2 and 7 are tests of speed, they could not be tested for reliability using the split-half procedure. Therefore, the reliability coefficients for these subtests were determined using test-retest correlations. A sample of subjects at various age and grade levels was retested no more than two days following the first assessment period. Reliability was also determined using a standard error of measurement for

cluster tests and achievement aptitude tests. The WJ was tested for validity using four types of validity: concurrent, predictive, content, and construct. Criterion-related validity was determined by comparing WJ scores to other assessment scores, i.e., Stanford-Binet Intelligence Scale, Peabody Picture Vocabulary Test-Revised, and the Wechsler Intelligence Scale for Children-Revised. A number of samples at varying age levels was collected. Some of them included a preschool sample, and sample of third grade students, fifth-grade students and twelfth-grade students. In all four types of validity, evidence indicated that the WJ was comparative to other instruments presently being used in psychoeducational evaluations.

The Test of Language Development-Intermediate (TOLD-I) Description and Standardization. The Test of Language Development-Intermediate (Hammill & Newcomer, 1982) has four principal uses: (a) to identify children who are significantly below their peers in language proficiency, (b) to determine children's specific strengths and weaknesses in language skills, (c) to document children's progress in language as a consequence of special intervention programs, and (d) to serve as a measurement device in research studies involving language behavior. The TOLD-I is made up of five subtests: (a) Sentence

Combining, (b) Characteristics, (c) Word Ordering, (d) Generals, and (e) Grammatical Comprehension. Raw scores for each subtest are converted to standard scores. All five standard scores are added to produce a sum of standard scores which is converted into a Spoken Language Quotient. Four other composite scores are also obtained: (a) Listening, (b) Speaking, (c) Semantics, and (d) Syntax.

The results of the TOLD-I are useful for differential diagnosis such the diagnosis of strengths and weaknesses in specific skill areas. The TOLD-I measures various features (syntax and semantics) and systems (listening and speaking) of language. Therefore, its results reveal a profile of children's specific abilities and disabilities in these areas. Such information has clinical utility in that it allows for the determination of a person's intra-individual differences. Although many types of assessment are necessary before definitive conclusions about an individual's language proficiency can be drawn, the TOLD-I can contribute valuable quantitative information to the total diagnostic effort. The TOLD-I is designed for use with children in the age range of 8 years, 6 months to 12 years, 11 months.

The TOLD-I was standardized on a sample of 871 children residing in thirteen states (Alabama, California, Iowa, Kansas, Kentucky, Louisiana, Maine, North Carolina, North

Dakota, New York, Pennsylvania, Texas, and Washington). Boys represented 49 percent of the standardization sample while girls made up 51 percent of the total sample. Fifty children at each age between 9 and 13 years were drawn at random from the standardization sample. The standard scores were added to produce a sum of standard scores for each of the five TOLD-I composite variables. For every age, the means and standard scores were computed. Since the data for each age level were practically the same, the sum of standard scores associated with the composites were combined into a single group of 200 children. The means and standard deviations of this total group were used to construct a standardized table which converts sums of standard scores to quotients.

Validity and Reliability. Coefficient alpha was used to estimate the internal consistency of the TOLD-I subtests and composite scores. This statistic was calculated on the test performance of the 200 randomly selected children who were used as subjects in the item analysis. According to the analysis, the scores associated with the composites have more than adequate internal consistency at all age levels studied. With a single exception, the same can be said of the subtest scores. Only the scores for the Word Ordering subtest failed to reach the criterion of .80 at the eleven and twelve year levels. The coefficients

reported for each age level for all five subtests and five composite scores 83 percent reached or exceeded .90.

To study the stability of the TOLD-I, thirty normal fifth and sixth grade children attending two elementary schools in Austin, Texas, were given the TOLD-I twice with one week intervening. The reliability coefficients exceed .80 for all five subtests and five composite scores. Additionally, the TOLD-I was found to have high correlations with the Test of Adolescent Language (Hammill, Brown, Larsen, & Wiederholt, 1980).

Peabody Picture Vocabulary Test-Revised (PPVT-R)

Description and Standardization. The Peabody Picture Vocabulary Test-Revised (PPVT-R) is a test designed to measure receptive vocabulary (Dunn & Dunn, 1981). This test is designed for subjects age 2 1/2 to 40. Raw scores are converted to; standard score equivalents, percentile ranks, stanines, and age equivalency scores.

The PPVT-R was standardized on a carefully selected sample of 5,028 persons which include 4,200 adolescents and children and 828 adults. The children and adolescents ranged in age from 2 years, 6 months to 18 years, 11 months. There were an equal number of males and females, 100 of each for each grade level. The sample of adults included 828 adults ranging in age from 19 to 40 years.

Validity and Reliability. Split-half correlations were

obtained for all subjects in the standardization sample. For the sample of children and adolescents, coefficients ranged from .67 to .88 on Form L with a median of .80 and from .61 to .86 on Form M with a median of .81. Thus, the split-half reliabilities were found to be similar for forms L and M. The median split-half coefficients for the adult sample was .82 on Form L. For the re-test reliability for the child's sample, the coefficients ranged from .71 to .89 with a median of .79. The validity of the PPVT-R has been tested through many studies comparing the PPVT-R with other vocabulary tests, and vocabulary subtests of intelligence and psycholinguistic tests. The PPVT-R correlated strongly with these various measures with an overall median value of .71 based on a total of 55 correlations. Three observations of the validity of the PPVT-R are found in the literature: (a) PPVT-R correlates highly with other vocabulary tests, (b) PPVT-R correlates moderately with other verbal intelligence scales, and (c) PPVT-R correlates somewhat to other measures of school achievement, but does not do well at predicting school success.

Lindamood Auditory Conceptualization Test (LAC)

Description and Standardization. The Lindamood Auditory Conceptualization Test (LAC) is a test used to measure auditory perception (Lindamood & Lindamood, 1979).It may be administered to a subject at any chronological or academic

level. The test consists of two categories: (a) isolated sounds in sequence, and (b) sounds within syllable patterns. Within each category there is a gradual increase in the complexity of the patterns presented as the test progresses. The subject is required to manipulate colored wooden blocks in response to speech patterns presented by the clinician. The subject places colored blocks in a row from left to right, each block representing a sound he has heard. One point is given for each correct pattern. The total possible score is 100.

The LAC was standardized on 660 students, grades K-12 from a school district in Monterey, California. Fifteen classrooms at each grade level, K-6 were selected which represented all of the district's socio-economic, ethnic and linguistic ranges. The teachers divided their classrooms into four sections based on classroom performance (upper and lower boys and upper and lower girls). One student from each of the four sections was randomly selected, which produced 60 students from each grade level. In grades 7 - 12 again each grade level was divided into four sections. Ten students were selected from each category for a total of 40 students from each grade level. A second sample of 52 students was chosen and tested from a school district in Pismo Beach, California.

Validity and Reliability. The reliability was determined

by testing and re-testing the sample of 52 students from the school district in Pismo Beach, California. Alternate forms of the LAC were used to test four students from each grade level, K-12. The tests were administered within a four week period. The test re-test reliability between form A and B was +.96 indicating that reliability and stability were high. The scores of both samples of children on the Wide Range Achievement Test, Reading and Spelling Subtests, were compared to the LAC test to predict its validity in being able to predict reading and spelling performance. The correlations of the WRAT combined with Reading and Spelling subtests ranged from +.66 to +.81 at the different age levels, the average being +.73, for the first sample of children. In the second sample of children, correlations of the LAC test with the WRAT reading and spelling subtests ranged from +.72 to +78 for both forms A and B. Those figures agree with the scores of the first sample of children.

The Raven's Coloured Progressive Matrices - Sets A, Ab, B Description and Standardization. The Raven's Coloured Progressive Matrices (Raven, 1956) consists of a recording form and a book of colored geometric matrices. In a large reproduction of each matrix, there is a small piece missing. The subject is instructed to select the missing piece, from a set of six smaller pictures, that fits into

the empty space on the larger matrix. The three sets of twelve problems constituting the Coloured Matrices are arranged to assess the chief cognitive processes of which children under 11 years of age are usually capable. The three sets together provide three opportunities for a person to develop a consistent theme of thought, and scale of thirty-six problems as a whole is designed to assess as accurately as possible, mental development up to intellectual maturity.

The Coloured Matrices, Sets A, Ab, B, are arranged to assess mental development up the stage when a person is sufficiently able to reason by analogy to adopt this way of thinking as a consistent method of inference. This apparently decisive stage in intellectual maturation appears to be one of the earliest to decline in later life, and the one most apt to be seriously impaired as the result of organic dysfunction.

Standardization was conducted twice in a test-retest situation. In 1948, the first sample was composed of 291 children, aged 5 years, 6 months to 9 years, 6 months. The second sample was obtained in 1949 and included 608 children, aged 5 years, 6 months to 11 years, 0 months.

Validity and Reliability. Information regarding validity and reliability was not available.

Stanford-Binet Intelligence Scale

Description and Standardization. The Stanford-Binet was originally devised by Binet and Simon to measure general intellectual abilities. Since its development, the Stanford-Binet has been revised three times. The first revision was in 1916 by Lewis M. Terman. In 1937, it was again revised by Terman and Merrill. The third and final revision was made in 1960. The scale consists of a number of subtests that are used to assess general intelligence for subjects age 2 years, 6 months to adult. One such subtest is the sentence repetition task, which was used in this study.

The Stanford-Binet was standardized in 1937 on 3,184 native born white subjects. There were approximately 100 subjects at each half-year internal for people ranging from 1 year, 6 months to 5 years, 6 months. There were 200 subjects at each level from ages 6 years to 14 years, and 100 subjects at each year from 15 to 18. There was an equal number of males and females.

Validity and Reliability. Correlations were made for each of the subtests on Forms L and M of the 1937 scale. The overall mean correlation for the 1960 revision was .66 as compared to a mean of .61 for all the tests in the 1937 revision. The correlations for the age range of 2 years, 6 months to 5 years had a mean of .61 in the 1960 revision as compared to .62 in 1937. For the age range of 6 years to

14 years, the mean was .67 in 1960 and .60 in 1937. The adult levels had the highest correlation with a mean of .73 in 1960 compared to a 1937 mean of .61. Reliability of the Stanford-Binet is represented by the high correlations for both Form L and M. There is also a high correlation between the individual subtests and the test as a whole.

Informal Assessment Measures

The Assessment and Analysis of Handedness: Edinburgh Inventory

Description and Standardization. The Edinburgh Inventory (Oldfield, 1971) was developed to provide a simple method of screening handedness. The instrument is based on a quantitative scale which provides a Laterality Quotient (L.Q.).

The Edinburgh Inventory was standardized on a group of 394 male and 734 female, undergraduate, psychology students at several English and Scottish Universities. The subjects comprised a wide range of socioeconomic, intelligence, and cultural backgrounds. The average age of the male subjects was 21.3 years, while the female subjects averaged 20.7 years. The author was not concerned about the limited age group because he believed that handedness was fully developed by age 20.

Validity and Reliability. Information on the reliability and validity of the Edinburgh Inventory was not available.

Rapid Automatic Naming (RAN) (Denckla & Rudel, 1974)

Description and Standardization. The RAN tasks were made up of nine charts consisting of an assortment of 50 pictured stimuli; objects, colors, letters, or numbers. The 50 stimuli consist of five different items that have been duplicated 10 times. These 50 items were randomly arranged in five horizontal rows with 10 items in each row. The pictured items on each chart were the following: (a) colors; red, green, black, blue, yellow, (b) numerals; 2, 6, 9, 4, 7, (c) high frequency of occurrence capital letters; A, D, S, L, R, (d) animals; dog, cow, cat, bird, squirrel, (e) lower case letters; b, q, e, c, i, (f) use objects; comb, key, watch, scissors, umbrella, (g) lower frequency of occurrence capital letters; V, U, H, J, F, (h) random objects; flag, drum, book, moon, wagon, and (i) high frequency of occurrence lower-case letters; p, o, d, a, s.

The pictured objects on the charts were photographed from the Stanford-Binet Intelligence Scale, Form L-M (1960) materials for Picture Vocabulary and Picture Memories, age ranges from 2 years, 3 months through 4 years, 1 month and year 3 level, respectively. This makes them suitable and recognizable for young children. The items on the use objects chart were chosen because of their familiarity, and the pictures of random objects were chosen due to the lack

of associations between items.

The subjects were instructed to name the pictures, numbers, or letters as fast as they could without making mistakes. They started in the upper left corner of the chart, moved across it toward the right while naming the pictures, and at the end of the line, moved back to the left to name the next row.

These tasks were standardized on 90 boys and 90 girls who were equally represented in six age groups, 5 to 11 years. The subjects were selected from the middle 50 percent of their class and were tested at their school in Fort Lee, New Jersey. The mean I.Q. for the public school population of Fort Lee, New Jersey was 106 with a standard deviation of 9.

Validity and Reliability. Information regarding validity and reliability was not available.

Phonemic Segmentation

Description and Standardization. (Lundberg, Olofsson, & Wall, 1980) designed a series of tasks to predict phonemic awareness skills in kindergarten. These tasks were divided into Word Syntheses and Word Analysis. The Word Synthesis Task that was used in this study was Synthesis of Phonemes (SYNPHONC). Each phoneme of a given word was attached to a peg, which was inserted into a pegboard. After the subject produced the phoneme in isolation he was then instructed to

read the word. After a successful synthesis of the phonemes the examiner turned a corresponding hidden picture of the word face up. The subject was then asked to perform two Word Analysis Tasks. The first Analysis Task was Segmentation into Phonemes (ANPHONC) in which the subject and the experimenter changed rolls. The subject presented a given word to the examiner by dividing the word into phonemes. The experimenter was to figure out, with guidance from the visually presented phonemes, what word the concealed picture represented. The second Analysis Task was Reversals of Phonemes (ANPHONREV) which required the subject to turn words around and pronounce them backwards, reversal of each word produced a meaningful word.

The subjects included in this study were 200 kindergarten children born in 1970. This investigation took place in Sweden, May 1977 and followed the children through their first semester of second grade. The institutions were scattered over the whole city of Umea and no socioeconomic bias could be discerned in any place.

Reliability and Validity. Information regarding reliability and validity was not available.

Written Language Samples (Hunt, 1970)

Description and Standardization. Written language samples were also obtained. The subjects were asked to read a

passage taken from Hunt (1970). They were then instructed to re-write the passage in a better way; to combine sentences, change the order of words, and omit redundant words. The passages were analyzed using a T-Unit analysis (Hunt, 1970). A T-unit is defined as " one main clause with all the subordinate clauses attached to it" (Hunt, 1970, p.4). Older children should begin to blend sentences together by the use of words such as "but" and "with." As the child matures, there should be fewer T-units per sentence but the length of the T-unit increases with age.

This task was administered to more than a thousand students in grades 4, 6, 8, 10, and 12 in the public schools of Tallahassee, Florida. The students were almost exclusively white. Steps were then taken to select from each grade 50 students who would represent something close to a normal distribution of academic ability. A normal curve for 50 subjects was divided into intervals the width of one-half a standard deviation, and the number of subjects that would be needed to fill each of those intervals was then calculated. However, to avoid the necessity for finding students with extremely high and low scores, the three intervals at the extreme ends of the bell curve were merged into one internal representing 1.5 standard deviations rather than 0.5. Then, on the basis of

their scores on certain standardized tests, the number of students needed to fill each of these intervals were chosen at random. These 50 students from each grade were further subdivided; 17 formed formed the "high" third (I.Q. range of 116.9 to 117.5) 16 formed the "middle" third (I.Q. range of 100.0 to 101.3) and 17 formed the "low" third (I.Q. range of 79.4 to 84.4).

Validity and Reliability. Information regarding validity and reliability was not available.

Data Collection

Each subject in the present study was seen individually in one diagnostic session, for approximately three hours. Responses to formal and informal assessment items for each subject were recorded on individual score sheets accompanying each instrument. Scoring of these responses was done by the examiner according to standard procedures for each instrument administered.

Treatment of Data

Because of the small sample size and types of scores obtained, all data in this study was handled descriptively. Formal and informal assessments of each subject were analyzed to determine if a subset of slow learners have a specific language deficit.

Chapter IV

FINDINGS

The description of the subjects used in this study includes information obtained from past and present assessments, from other professionals, and reports describing the subjects educational and medical background. The purpose of this study was to gather and analyze data obtained from a specific battery of language tests administered to five slow learning children enrolled in the Garland Independent School District's Alternative for Individual Needs of Students (GAINS) Program. The results of testing were analyzed to answer the following research questions: (a) Do slow learners enrolled in the GAINS Program have underlying specific language deficits as determined by a comprehensive language battery? and (b) If slow learners have specific language deficits do they fall into subgroups found previously (Denckla, 1977) in dyslexic children?

Description of Participants

Background Information

The five subjects used in this study were selected from the Garland Independent School District's Alternatives for Individual Needs of Students (GAINS) Program. All of the

subjects were male, monolingual, and were from lower-middle to upper-middle class socioeconomic environments as defined by the ranking developed by Warner, Meeker, and Eells (1960). The subjects exhibited hearing levels within normal limits as assessed by audiological screening administered at 25 dB hearing level. Age ranges were from 10 years, 0 months to 12 years, 10 months with a mean age of 11 years, 7 months, 24 days.

Each subject was required to exhibit intellectual functioning within the slow learner range (Full Scale I.Q. 70 to 89) as assessed by the Wechsler Intelligence Scale for Children-Revised. In addition, each subject was required to have normal nonverbal intelligence of 85 or above. Table 1 provides each subject's (identified as 1, 2, 3, 4, and 5) background information and information obtained from previous sources.

Subject 1 was an 11 year, 11 month old white, monolingual male who was in the fifth grade. The subject repeated the first grade. An evaluation for Special Education placement was conducted April 26, 1984, he did not qualify for services under current state guidelines. All other medical and developmental history was unremarkable. The subject was identified as a slow learner by using his Wechsler Intelligence Scale for Children-Revised, Full Scale Intelligence Quotient of 89, he had a Performance

Table 1

Descriptive Summary of Subjects' Backgrounds

Category	Subject 1	2	3	4	5
Date of Birth	7-7-75	5-31-77	12-11-74	8-9-74	6-2-76
Age	11yrs 11mos	10yrs 0mos	12yrs 6mos	12yrs 0mos	11yrs 0mos
Sex	Male	Male	Male	Male	Male
Education	Fifth Grade	Third Grade	Fifth Grade	Fifth Grade	Fourth Grade
Medical History	No history of CNS infection, surgery, or trauma	No history of CNS infection, surgery, or trauma	No history of CNS infection, surgery, or trauma	Born 6 wks early, at 5lbs, 6ozs. Hernia operation 1yr. No history of CNS infection or trauma	Jaundice, cancer of kidneys at birth. Cancer treatments, oxygen used at birth. No history of CNS infection or trauma
WISC-R					
Date Given	4-26-84	1-5-87	9-18-85	11-7-84	9-22-86
Performance I.Q.	96	95	87	93	92
Verbal I.Q.	85	82	82	75	85
Full Scale I.Q.	89	87	84	83	87
Woodcock-Johnson					
Date Given	4-26-84	1-5-87	9-18-85	11-7-84	9-22-86
Reading S.S.	81	84	79	69	79
Mathematics S.S.	81	87	87	82	84
Written Language S.S.	85	84	78	77	79
Spelling S.S.	n/a	n/a	n/a	n/a	69

Note: For a student to qualify as learning disabled in the State of Texas, the Woodcock-Johnson ----- Achievement standard scores must be 16 points below the WISC-R Full Scale I.Q..

Intelligence Quotient of 96 and was placed in the Garland Alternative for Social Promotion (GAINS) Program.

Subject 2 was a 10 year, 0 month old white, monolingual male in the third grade. The subject repeated the second grade. An evaluation for Special Education was conducted January 5, 1987, he did not qualify for services under current state guidelines. All other medical and developmental history was unremarkable. The subject had been identified as a slow learner by using his Wechsler Intelligence Scale for Children-Revised, Full Scale Intelligence Quotient of 87, he had a Performance Intelligence Quotient of 95 and was placed in the Garland Alternative for Social Promotion (GAINS) Program.

Subject 3 was a 12 year, 6 month old white, monolingual male in the fifth grade. The subject repeated the third grade. This subject was served in the Campus Based Special Education Classroom for reading, however, results of his three year special education re-evaluation on September 18, 1985 revealed that he no longer qualified for services. All other medical and developmental history was unremarkable. The subject had been identified as a slow learner by using his Wechsler Intelligence Scale for Children-Revised Full Scale Intelligence Quotient of 84, he had a Performance Intelligence Quotient of 87 and was

placed in the Garland Alternative for Social Promotion (GAINS) Program.

Subject 4 was a 12 year, 10 month old black, monolingual male who was in the fifth grade. The subject repeated the first and fifth grades. An evaluation for Special Education placement was conducted November 7, 1984, he did not qualify for services under current state guidelines. The subject's father stated that birth was six weeks earlier than expected, birth weight was 5 pounds, 6 ounces. The subject had a hernia operation at age 1 year. All other medical and developmental history was unremarkable. The subject had been identified as a slow learner by using his Wechsler Intelligence Scale for Children-Revised, Full Scale Intelligence Quotient of 83, he had a Performance Intelligence Quotient of 93 and was placed in the Garland Alternative for Social Promotion (GAINS) Program.

Subject 5 was an 11 year, 0 month old white, monolingual male who was in the fourth grade. The subject repeated kindergarten and was served in Campus Based Special Education Classes. Upon completion of his three year re-evlauation on September 22, 1986, the ARD committee agreed that the GAINS Program would be the least restrictive environment for him even though he qualified for spelling under state guidelines as a learning disabled student. The subject's mother stated that during pregnancy

she had a tumor and that he was born with cancer of both kidneys. Due to cancer treatments she felt he lost about 1 1/2 years of maturity time. The subject was jaundiced at birth and oxygen was used. Birth weight was 7 pounds, 13 ounces. All other medical and developmental history was unremarkable. The subject had been identified as a slow learner by using his Wechsler Intelligence Scale for Children-Revised, Full Scale Intelligence Quotient of 87, he had a Performance Intelligence Quotient of 92 and was placed in the Garland Alternative for Social Promotion (GAINS) Program.

Analysis of the Data

Results of Formal Assessment

The Test of Language Development - Intermediate (TOLD-I) (Hammill & Newcomer, 1982) was administered to each subject to evaluate language ability. The TOLD-I consists of five subtests. The subtests are: Sentence Combining (SC) which requires the subject to form one compound or complex sentence from two or more simple sentences presented orally by the examiner. This is considered to be primarily a speaking task. Characteristics (CH) which requires the subject to determine the validity or truth of simple statements that are spoken by the examiner. This subtest is primarily a listening task. Word Ordering (WO) requires the subject to reorder words which form a complete, correct

sentence from randomly ordered words presented orally by the examiner. This is considered to be primarily a speaking task. Generals (GL) which requires the subject to tell how three words spoken by the examiner are alike by verbalizing either the relationships among the words or the superordinate category to which the words belong. This is essentially a speaking task. Grammatic Comprehension (GC) measures the subject's ability to recognize incorrect grammar in spoken sentences. This subtest primarily involves listening ability. Each of the subtests raw scores are converted to standard scores which have a mean of 10 and a standard deviation of 3, thus scores between 7 and 13 are considered to be in the average range. Each subject's subtest standard scores are shown on Table 2 below:

Table 2

Subjects' TOLD-I Subtest Standard Scores

		Subjects				
Subtests		1	2	3	4	5
Sentence Combining	C.A.	4	4	6	3	4
	M.A.	5	5	7	4	5
Characteristics	C.A.	5	2	7	5	9
	M.A.	6	6	8	6	9
Word Ordering	C.A.	1	6	9	5	6

(table continues)

Subtests		Subjects 1	2	3	4	5
	M.A.	4	8	10	6	7
Generals	C.A.	3	4	9	7	9
	M.A.	6	6	11	8	11
Grammatic Comprehension	C.A.	6	5	5	7	8
	M.A.	6	5	6	9	8

C.A. = Chronological age

M.A. = Mental age

The subtests of the TOLD-I can be combined into composite scores which show performance on understanding language (Listening), expression (Speaking), vocabulary development (Semantics), sentence structure (Syntax), and overall language development (Spoken Language). Each of these composite scores are converted to standard scores having a mean of 100 and a standard deviation of 15, thus cluster scores between 85 and 115 are considered to be in the average range. Each subject's composite standard scores are shown on Table 3 below:

Table 3

Subjects' TOLD-I Composite Standard Scores

(table continues)

	Subjects				
Composite Scores	1	2	3	4	5
Spoken Language					
Quotient C.A.	54	56	79	66	79
M.A.	66	70	88	74	85
Listening					
Quotient C.A.	73	61	76	76	91
M.A.	76	73	82	85	97
Speaking					
Quotient C.A.	53	66	87	68	76
M.A.	68	76	96	74	85
Semantic					
Quotient C.A.	64	58	88	76	94
M.A.	76	76	97	82	100
Syntax					
Quotient C.A.	59	68	79	68	74
M.A.	68	74	85	76	79

Note: For a student to qualify for language therapy in Garland, Texas their TOLD-I Spoken Language Quotient must be 16 points below their WISC-R Full Scale Intelligence Quotient.

The Peabody Picture Vocabulary Test - Revised - Form M (PPVT-R) (Dunn & Dunn, 1981) was administered to the subjects to assess their receptive, or understanding, vocabulary. The subject's task is to point to the picture

considered to illustrate best the meaning of a stimulus word presented orally by the examiner. Each plate of pictures has four simple, black and white pictures, arranged in a multiple choice format. The test has a mean of 100 with a standard deviation of 15, thus scores between 85 and 115 are considered to be in the average range. The subjects receptive vocabulary standard scores and percentile ranks for their chronological and mental ages are listed on Table 4 below:

Table 4

Subjects' PPVT-R Standard Scores and Percentile Ranks for their Chronological Age and Mental Age

Subjects	Standard Scores	Percentile Rank
1	C.A. = 70 M.A. = 77	C.A. = 2 M.A. = 6
2	C.A. = 70 M.A. = 81	C.A. = 2 M.A. = 11
3	C.A. = 92 M.A. = 106	C.A. = 30 M.A. = 66
4	C.A. = 65 M.A. = 75	C.A. = 1 M.A. = 5
5	C.A. = 96 M.A. = 108	C.A. = 40 M.A. = 70

Note: Subjects' Mental Ages were computed using their WISC-R Full Scale Intelligence Quotients.

Note: For a student to qualify for language therapy in Garland, Texas their PPVT-R standard scores must be 16 points below their WISC-R Full Scale Intelligence Quotient.

The Lindamood Auditory Conceptualization Test (LAC) (Lindamood & Lindamood, 1979) was administered to the

subjects to assess their ability to distinguish speech sounds. This test was designed to evaluate the subjects conceptualization of an isolated phonemic unit and to further evaluate their ability to perceive the number and sequence of sounds presented orally in a specific spoken pattern. Category I-A and I-B test the subjects ability to perceive isolated sounds in sequence. The total possible score for this category is 28. Category II tests the subjects ability to perceive sounds within a syllable pattern. The total possible score for this category is 72. Minimum expectancy scores for grade levels K through 12 are presented for the first and second halves of each grade level. The subjects in this study were compared with the second half scores since this testing was administered the last three days of school for the 1986 - 1987 school year. Each subjects LAC scores are presented in Table 5 according to their current grade placement.

Table 5

Subjects' LAC Scores as Compared With Minimum Grade Expectancy Scores

Subjects	Category I Score	Category II Score	Total Score	Grade Expectancy Score

(table continues)

Table 5

Subjects' LAC Scores as Compared With Minimum Grade Expectancy Scores

Subjects	Category I Score	Category II Score	Total Score	Grade Expectancy Score
1	28	24	52	93
2	28	48	76	81
3	28	42	70	93
4	28	12	40	93
5	25	54	79	86

Note: Category I has a maximum possible score of 28.
Category II has a maximum possible score of 72.
The Total possible score for the LAC is 100.

The Raven's Standard Progressive Matrices (Raven, 1956) were administered to the subjects to assess their visual spatial problem solving abilities. From a large reproduction of each matrix there is a small piece missing. Each subject was instructed to select the missing piece from a set of six smaller pictures that fit into the empty space on the larger matrix This test was designed to assess as accurately as possible, a person's nonverbal ability to reason by analogy and their current level of intellectual development. The scores that are obtained on

this test are converted to a quartile of I, II, III, IV, or V. Quartile III is considered to represent average intellectual functioning. A plus or minus sign inserted following the quartile designation indicates whether the subject's performance is in the upper or lower half of quartile III. Subject 1 received a percentile of 52 which was converted to quartile III+, Subject 2 received a percentile of 52 which was also converted to quartile III+, Subject 3 received a percentile of 76 which was unable to be converted due to norms not being available for his C.A., Subject 4 received a percentile of 11 which was also unable to be converted due to norms not being available for his C.A., and finally Subject 5 received a percentile of 49 which was converted to quartile III.

The Sentence Repetition Subtest of the Stanford-Binet Intelligence Scale (Terman and Merrell, 1960) was also administered to all of the subjects. This subtest consists of two sentences. The subject is asked to repeat the two sentences following oral presentation by the examiner. The total possible score for this subtest is 2. Each subject successfully repeated each sentence, therefore obtaining the total possible score of 2.

Results of Informal Assessment

The subjects laterality preference was determined by asking them to respond to ten questions regarding which

eye, hand, or foot they used for various functions (Oldfield, 1971). A percentage of handedness for each side was computed and assigned a decile value. The decile scale ranged from one to ten with ten representing 100 percent right or left handedness. The highest of the two percentages was considered to be the dominant preference and it became the laterality quotient (L.Q.). A plus sign preceding the quotient indicates a dominant preference for the right hand while a minus sign indicates a left hand dominance. All subjects were found to be dominantly right handed as each had an L.Q. of +100 with a decile of R10. Rapid Automatic Naming of Pictured Objects, Colors, Letters, and Numbers (RAN) (Denckla & Rudel, 1974) was next administered to the subjects. This test was designed to measure the ability to recall names of pictures, lower and upper case letters, colors, and numbers. Each subject was asked to name the objects, letters, colors, or numbers on each of the nine charts as quickly as possible without making any mistakes. As the examiner noted the subjects total time for each chart, notations were also made of errors and shifts. The charts that are found to be named fastest are letters and numbers, which are followed by colors and pictures (Denckla & Rudel, 1974, p. 198). Each subjects' total time was compared to the normative naming data for all nine charts ages 5 years, 0 months through 10

years, 11 months (p. 191). If subjects were found to be slow in comparison to the normative naming data these subjects could be at risk to be classified as anomic language disorder syndrome (Denckla, 1977). Each subjects RAN performance is computed using normative naming data for their mental ages based on their WISC-R Full Scale Intelligence Quotients and is found on Table 6.

Phonemic Segmentation (Lundberg, Olofsson & Wall, 1980) was also administered to the subjects to evaluate their ability to segment and synthesize spoken words. All subjects were presented with the same sixteen Word Synthesis Items, Synthesis of Phonemes (SYNPHONC). Each phoneme of a given word was attached to a peg, which was inserted into a pegboard. After the subject produced the phonemes in isolation he was then instructed to read the word. After a successful synthesis of the phonemes the examiner turned a corresponding picture of the word face up. The subjects next completed two Word Analysis Tasks. The first task, Segmentation into Phonemes (ANPHONC) required the child and the examiner to change rolls. The subject presented a given word to the examiner by dividing the word into phonemes. The experimenter was to figure out, with guidance from the visually presented phonemes, what word the hidden picture represented. The second task, Reversals of Phonemes (ANPHONREV) required the subjects to turn words

Table 6
Results of Denckla and Rudel's (1974) Rapid Automatic Naming Tasks

	Total Time					Time Expectancy for M.A.				
Subtests	1	2	3	4	5	1	2	3	4	5
Animals	55.92	42.80	50.17	58.73	53.73	45.3	54.8	45.3	45.3	44.9
Std dev						7.2	10.5	7.2	7.2	7.6
Colors	41.95	41.83	39.70	54.57	56.24	42.3	54.7	42.3	42.3	46.5
Std dev						8.2	6.9	8.2	8.2	11.4
Random Objects	58.96	52.75	64.77	63.76	61.10	48.3	61.0	48.3	48.3	53.4
Std dev						13.6	8.0	13.6	13.6	15.4
Use Objects	65.07	50.57	60.90	61.38	69.24	50.6	61.6	50.6	50.6	48.7
Std dev						10.8	12.6	10.8	10.8	10.7
Letters										
LC, HF	46.37	28.78	31.98	26.53	29.13	23.5	30.6	23.5	23.5	25.1
Std dev						2.9	6.9	2.9	2.9	5.1
UC, LF	40.13	37.08	40.07	35.99	33.72	30.8	39.8	30.8	30.8	32.5
Std dev						5.5	9.0	5.5	5.5	5.9
LC, LF	39.91	27.16	28.52	27.44	32.54	25.6	32.9	25.6	25.6	27.8
Std dev						4.5	6.9	4.5	4.5	9.4
UC, HF	39.56	30.66	35.52	27.22	29.34	24.9	30.3	24.4	24.4	25.2
Std dev						3.9	5.3	3.9	3.9	5.8
Numbers	35.45	34.54	33.29	24.52	35.70	24.2	30.8	24.2	24.2	25.8
Std dev						3.5	5.8	3.5	3.5	8.6
Total slow tasks for each subject						7.00	0.00	5.00	4.00	4.00

Note: Time represented in seconds
----- Std dev = standard deviation
M.A. = mental age
HF = high frequency
LF = low frequency
UC = upper case
LC = lower case

around and pronounce them backwards. After 2 trails each subject was presented with 6 words (3 two-phoneme words and 3 three-phoneme words) orally produced by the examiner, all 6 words yielded a meaningful word when completely reversed. Lundberg, Olofsson, and Wall (1980) state that the two Word Analysis Tasks (ANPHONC) and (ANPHONREV) are the most powerful determinants for reading and writing skills. These skills were developing in "normal" 7 year olds in Sweden. All subjects phonemic segmentation results are listed in Table 7.

Written Language Samples (Hunt, 1970) were also obtained from each subject. The subjects were asked to read a passage from Hunt (1970). They were then instructed to re-write it in a better way; to combine sentences, change the order of words, and omit redundant words. The written samples were analyzed using a T-unit analysis (Hunt, 1970). The following criteria were used: (a) total number of words, (b) total number of clauses, (c) total number of T-units, and (d) total number of sentences. The written samples were then analyzed for: (a) mean words per clause, (b) mean clause per T-unit, (c) mean T-unit per sentence, and (d) mean words per sentence. A T-unit is defined as "one main clause with all the subordinate clauses attached to it" (Hunt, 1970, p.4). There should be fewer T-units and they should be longer as the child matures. Mean words

Table 7
Phonemic Segmentation Results

	Percent Correct for Each Subject				
	1	2	3	4	5
Word Synthesis Tasks (SYNPHONC)	100.00	100.00	100.00	100.00	100.00
Word Analysis Tasks (ANPHONC)	93.75	100.00	100.00	100.00	100.00
Ability to Reverse 2 & 3 Phoneme Words (ANPHONREV)	33.30	83.30	83.30	33.30	0.00

Note: Lundberg, Olofsson, and Wall (1980) found the two Word Analysis Tasks to be the most powerful determinants for reading and writing skills.

per T-unit has been found to be an excellent measure of children's use of more advanced sentence combining transformations (Hunt, 1965) (O'Donnell, Griffin, & Norris, 1967). In addition, (Roberts, 1987) found that the percentage of T-units with more than one clause was a sensitive measure of syntactic complexity in adults with acquired aphasia. Each subject's T-unit analysis (Hunt, 1970) including their percentage of T-units with more than one clause (Roberts, 1987) is presented in Table 8.

Summary

This study analyzed the language performance of five slow learners enrolled in the Garland Alternative for Individual Needs of Students (GAINS) Program, Garland, Texas. A comprehensive language battery which was previously used with dyslexic and learning disabled children (Denckla, 1977) was augmented for the purposes of this study. The subjects were all males who came from monolingual homes in the lower-middle to upper-middle class socioeconomic range as defined by the ranking developed by Warner, Meeker, and Eells (1960). Case histories obtained on each subject revealed no evidence of psychological, physical, or emotional anomalies which could account for the subjects' intellectual functioning and learning rate. In addition, the subjects' exhibited hearing levels within normal limits as assessed by audiological screening

Table 8
Results of T-Unit Analysis

	Subject					Hunt's Norm For Fourth Grade	Standard Deviation
	1	2	3	4	5		
Grade	5	3	5	5	4		
Mean Words per Clause	2.60	3.25	2.66	3.60	2.66	5.04	0.88
Mean Clause per T-Unit	0.16	0.13	0.10	0.17	0.09	1.04	0.11
Mean Words per T-Unit	4.00	4.03	4.10	3.57	4.06	5.23	1.13
Mean T-Units per Sentence	2.58	1.00	1.76	2.15	1.68	1.78	0.63
Mean Words per Sentence	12.83	4.41	8.47	10.15	7.36	9.37	3.21
% of T-Units with more than one Clause	6.20%	7.25%	10.00%	5.60%	10.66%		

Note: Mean words per T-Unit has been found to be an excellent measure of a child's use of more advanced sentence combining transformations (Hunt, 1970, p.17)

Roberts (1987) found percent of T-Units with more than one clause to be a sensitive measure of syntactic complexity.

administered at 25 dB hearing level. All subjects exhibited a minimum Performance I.Q. of 87 as determined by the Wechsler Intelligence Scale for Children-Revised (Wechsler, 1974). Data was analyzed to determine the following research questions: (a) Do slow learners enrolled in the GAINS program have underlying specific language deficits as determined by a comprehensive battery? and (b) If slow learners have specific language deficits do they fall into subgroups found previously (Denckla, 1977) in dyslexic children?

Analysis of the subjects' language abilities utilizing the Test of Language Development-Intermediate (Hammill & Newcomer, 1982) revealed that Subjects 1, 2, and 4 exhibited language deficits when comparing their WISC-R Full Scale Intelligence Quotients to their TOLD-I Spoken Language Quotients. Subjects 3 and 5 had TOLD-I Spoken Language Quotients which were commensurate with their WISC-R Full Scale Intelligence Quotients at this time.

Results of the Peabody Picture Vocabulary Test-Revised (Dunn & Dunn, 1981) indicated that Subjects 1, 2, and 4 also have a receptive language deficit when comparing their PPVT-R standard scores to their WISC-R Full Scale Intelligence Quotients. Subjects 3 and 5 however exhibited receptive language abilities above their WISC-R Full Scale Intelligence Quotients.

The Lindamood Auditory Conceptualization Test-Revised (Lindamood & Lindamood, 1979) found all subjects to be able to perceive isolated sounds in sequence as Subjects 1, 2, 3, and 4 had the highest possible score of 28 and Subject 5 had a score of 25. However, in their ability to perceive sounds within a syllable pattern, Subjects 1, 3, and 4 showed great difficulty with this task. Subjects 2 and 5 had scores within their grade expectancy.

The Raven's Coloured Progressive Matrices (Raven, 1956) revealed Subjects 1, 2, and 5 to be within the average range of intellectual functioning. Normative data was not available for Subjects 3 and 4 as their chronological ages were above the normative sample.

All Subjects did well on the Sentence Repetition Subtest of the Stanford-Binet Intelligence Scale (Termin & Merrill, 1960). Each Subject correctly repeated the two sentences presented orally by the examiner.

The Subjects were all found to be dominantly right handed as determined by the Assessment and Analysis of Handedness: Edinburgh Inventory (Oldfield, 1971).

The Rapid Automatic Naming Tasks (Denckla & Rudel, 1974) found Subjects 1, 3, 4, and 5 to be slow on at least 2 of the RAN tasks according to their mental ages, Subject 2 however named all 9 nine charts within speed for his mental age.

Phonemic Segmentation Tasks (Lundberg, Olofsson, & Wall, 1980) revealed that all Subjects were able to read or synthesize phonemes into words. Subjects 2, 3, 4, and 5 were able to select the correct phonemes and place them in proper sequence for examiner's synthesis. Subject 1 had a slight degree of difficulty with this Word Analysis Task however his score was 93.75. Subjects 1, 4, and 5 had difficulty in reversing the 2 and 3 phoneme words presented orally by the examiner. Subjects 2 and 3 had a moderate degree of difficulty as their scores were 83.30.

Finally the subjects written language samples (Hunt, 1971) found Subjects 1, 2, 4, and 5 to be below normative data for fourth grade norms on Mean Words per T-unit which has been found to be an excellent measure of children's use of more advanced sentence combining transformations (Hunt, 1970). All subjects were below normative data on Mean Words per Clause and Mean Clause per T-unit. Subject 1 had more T-units per sentence than his grade level would predict, all other subjects had T-units per sentence within grade expectancy. T-units with more than one clause was found to be a sensitive measure of syntactic complexity in adult aphasics (Roberts, 1987). All subjects were found to be below normative data for their age.

CHAPTER V

Summary, Discussions, Conclusions, and Recommendations

Summary

Because of the paucity of studies which have assessed the slow learning population, the present study was undertaken to provide data on language processing in a small sample of slow learning children. A detailed battery of language tests used previously with dyslexic and learning disabled subjects (Denckla, 1977) was augmented for the purposes of this study. This language battery was administered to five slow learning male children enrolled in the Garland Independent School District's Alternative for Individual Needs of Students (GAINS) Program. This study sought to determine if there was a significant discrepancy between language processing and nonverbal intellectual potential in one or more of the areas of receptive and expressive language, receptive vocabulary, auditory phoneme perception, visual-spatial problem solving abilities, sentence repetition, rapid automatic naming ability, phonemic segmentation, and written language. This study was descriptive in nature and was designed primarily to identify if specific language deficits exist in this small sample of slow learners by providing answers to the

following questions: (a) Do slow learners enrolled in the GAINS program have underlying specific language deficits as determined by a comprehensive language battery? and (b) If slow learners have specific language deficits do they fall into subgroups found previously (Denckla, 1977) in dyslexic children?

Discussion

In the state of Texas a student is determined to have a communication disorder when this disorder is documented by a certified speech-language pathologist. The state does not provide a list of approved tests to qualify a student as speech handicapped. This decision is left up to the local school district (Mary Cole, personal communication, October 14, 1987). In Garland, Texas a student may qualify for language services when their language scores are 16 points below their Full Scale Intelligence Quotient. The Test of Language Development-Intermediate and The Peabody Picture Vocabulary Test-Revised are two tests approved by the Garland I.S.D. to be used in qualifying a student for speech services.

Analysis of language development utilizing the TOLD-I proved to be a sensitive measure of syntax, semantics, listening, and speaking. Subjects 1, 2, and 4 were found to have language deficiencies as their Spoken Language Quotients (SLQ) ranged from 17 to 35 points below their

WISC-R Full Scale Intelligence Quotient. Hammill and Newcomer (1982) compare a child with a TOLD-I SLQ of 74 with his Test of Nonverbal Intelligence Quotient of 87 and state:

> Steve's poor language cannot be accounted for entirely by low mental abilities. These results indicate that further assessment of Steve's language ability is warranted and that in all probability he will require specific language instruction (p. 14).

Subjects 3 and 5 were found to have language functioning commensurate with their intellectual functioning at this time, as their SLQ's ranged from 5 to 8 points below their Full Scale I.Q..

Results of the Peabody Picture Vocabulary Test-Revised (Dunn & Dunn, 1981) also indicated that Subjects 1, 2, and 4 qualify for language therapy. These subject's standard scores ranged from 17 to 19 points below their Full Scale I.Q.. Subjects 3 and 5 received standard scores ranging from 8 to 9 points above their Full Scale Intelligence Quotients.

Analysis of the subjects Wechsler Intelligence Test for Children-Revised revealed that the three subjects found to have a language deficit had Verbal I.Q.'s lower than their Performance I.Q.'s ranging from 11 to 18 points. The two subjects that did not appear to have a language deficit had

Verbal I.Q.'s that were from 5 to 7 points lower than their Performance I.Q.. Therefore, a Verbal and Performance gap of 10 points or more may be a marker for this population and warrant further language testing.

Results of The Lindamood Auditory Conceptualization Test-Revised (Lindamood & Lindamood, 1979) revealed that all subjects were able to perceive isolated sounds in sequence as Subjects 1, 2, 3, and 4 received the highest possible score of 28 and Subject 5 had a score of 25. However, in their ability to perceive sounds within a syllable pattern, Subjects 1, 3, and 4 showed great difficulty with this task their scores ranged from 53 to 23 points below minimum grade expectancy. Subjects 2 and 5 had scores within their grade expectancy.

The Raven's Standard Progressive Matrices (Raven, 1956) found subjects 1, 2, and 5 to all be in the average range of visual-spatial problem solving abilities. These results correlate with their WISC-R Performance I.Q.'s. Normative data was not available for subjects 3 and 4 according to their chronological ages.

All subjects were found to have appropriate sentence repetition ability as assessed by the Sentence Repetition Subtest of the Stanford-Binet Intelligence Scale (Terman & Merrill, 1960).

The Rapid Automatic Naming Tasks (Denckla & Rudel,

1974) compared the subjects to the normative naming sample for all nine charts according to their mental age. Subject 1 was found to be slow on 7 tasks, Subject 2 was not found to be slow on any tasks, Subject 3 was slow on 5 tasks, and Subjects 4 and 5 were found to be slow on 4 tasks. These results should be interpreted cautiously as the normative sample did not contain slow learners.

The Phonemic Segmentation Tasks (Lundberg, Olofsson, & Wall, 1980) revealed that all Subjects were able to read or synthesize phonemes into words therefore all subjects did well on the Word Synthesis Task (SYNPHONC). Subjects 2, 3, 4, and 5 were able to select the correct phonemes and place them in proper sequence for examiners synthesis (ANPHONC). Subject 1 had a slight degree of difficulty with this Word Analysis Task however, his score was 93.75. Subjects 1, 4, and 5 had difficulty in reversing the 2 and 3 phoneme words presented orally by the examiner (ANPHONREV). Subjects 2 and 3 had a moderate degree of difficulty as their scores were 83.30. Lundberg, Olofsson, and Wall (1980) found the 2 Word Analysis Tasks; (ANPHONC) and (ANPHONREV) to be the most powerful determinants for reading and writing skills. It should be noted that these tasks were developed to be used with 7 year olds in Sweden, the mean age of the five subjects in this study was 11 years, 7 months.

The subject's written language samples were analyzed by using a T-unit analysis (Hunt, 1970). Subjects 1, 2, 4, and 5 were found to be below normative data for fourth grade on Mean Words per T-unit which has been found to be an excellent measure of children's use of more advanced sentence combining transformations (Hunt, 1970). All subjects were below normative data on Mean Words per Clause and Mean Clause per T-unit. Subject 1 had more T-units per sentence than his grade level would predict, all other subjects had T-units per Sentence within grade expectancy. As normal children mature, Hunt found that there were fewer T-units per sentence but the length of the T-unit was longer. Percent of T-units with more than one clause was found by Roberts (1987) to be an sensitive indicator of syntactic complexity in adult aphasics. All of the subjects used few multi-clause T-units in their writing as demonstrated by the clauses per T-unit percent range from 5.60 to 10.66 percent. This measure has not been used previously with slow learners.

Conclusions

Among the limited sample of five slow learning children assessed in the present study, they all appeared to have some type of language processing deficiency. Each of the five formal measures and the three informal measures presented to the subjects assessed in this study proved to

be sensitive measures of language processing.

Subject 1 had scores below his measured level of intellectual functioning on the TOLD-I, PPVT-R, LAC, RAN, (ANPHONC) and (ANPHONREV) Phonemic Segmentation Tasks, and Written Language Samples. His Raven's, (SYNPHONC) Phonemic Segmentation Task, and Sentence Repetition scores were within normal limits.

Subject 2 had scores below his measured level of intellectual functioning on the TOLD-I, PPVT-R, Written Language Samples, and (ANPHONREV) Phonemic Segmentation Task. His scores on the Raven's, LAC, Sentence Repetition, RAN, (SYNPHONC) and (ANPHONC) Phonemic Segmentation Tasks were within normal limits.

Subject 3 exhibited scores below his measured level of intellectual functioning on the LAC, RAN, Written Language Samples, and (ANPHONREV) Phonemic Segmentation Task. His scores on the TOLD-I, PPVT-R, Sentence Repetition, (SYNPHONC) and (ANPHONC) Phonemic Segmentation Tasks were within normal limits.

Subject 4 exhibited scores below his measured level of intellectual functioning on the TOLD-I, PPVT-R, LAC, RAN, Written Language Samples, and (ANPHONREV) Phonemic Segmentation Task. His scores on the Sentence Repetition, (SYNPHONC) and (ANPHONC) Phonemic Segmentation Tasks were within normal limits.

Subject 5 exhibited scores below his measured level of intellectual functioning on the RAN, Written Language Samples, and (ANPHONREV) Phonemic Segmentation Task. His scores on the TOLD-I, PPVT-R, LAC, Sentence Repetition, Raven's, (SYNPHONC) and (ANPHONC) Phonemic Segmentation Tasks were within normal limits.

Yes is the answer to the first research question which was: Do slow learners enrolled in the GAINS program have underlying specific language deficits as determined by a comprehensive language battery? In this small sample studied results ranged from rather mild basic reading difficulties to difficultly with every dependent measure used in assessing language in this study. Yes is the answer to the second research question: If slow learners have specific language deficits do they fall into subgroups found previously (Denckla, 1977) in dyslexic children? Three of the five subjects appeared to have anomic language disorder syndrome, they had normal comprehension as measured by the WISC-R but were slow on more than 2 RAN tasks. One of the five subjects appeared to have mixed language disorder syndrome. He did not have normal comprehension as measured by the WISC-R and was slow on more than 2 RAN tasks. Again, it should be emphasized that these results must be interpreted cautiously as slow learning children have not previously been evaluated with

this battery.

Recommendations

As a result of the present study, the following recommendations for future research and clinical intervention are made.

Future Research

1. Conduct additional research to include a larger number of slow learning subjects consisting of both males and females.

2. Conduct a longitudinal study following the language disordered subgroup of slow learners found in this study to determine if this subset would benefit from language based instruction in reading and math provided by a speech-language pathologist.

Clinical Intervention

1. A complete special education assessment must be given to all children before they are placed in an alternative for social promotion program.

2. The current Federal and State guidelines must be challenged until every child obtains the educational assistance that they deserve as these guidelines are not providing educational assistance for a subgroup of children that are falling through the cracks.

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APPENDIXES

APPENDIX A

SUBJECTS WECHSLER INTELLIGENCE SCALE FOR CHILDREN-REVISED PROFILE SHEETS

CONFIDENTIAL

School _____ Test Date 4-26-84

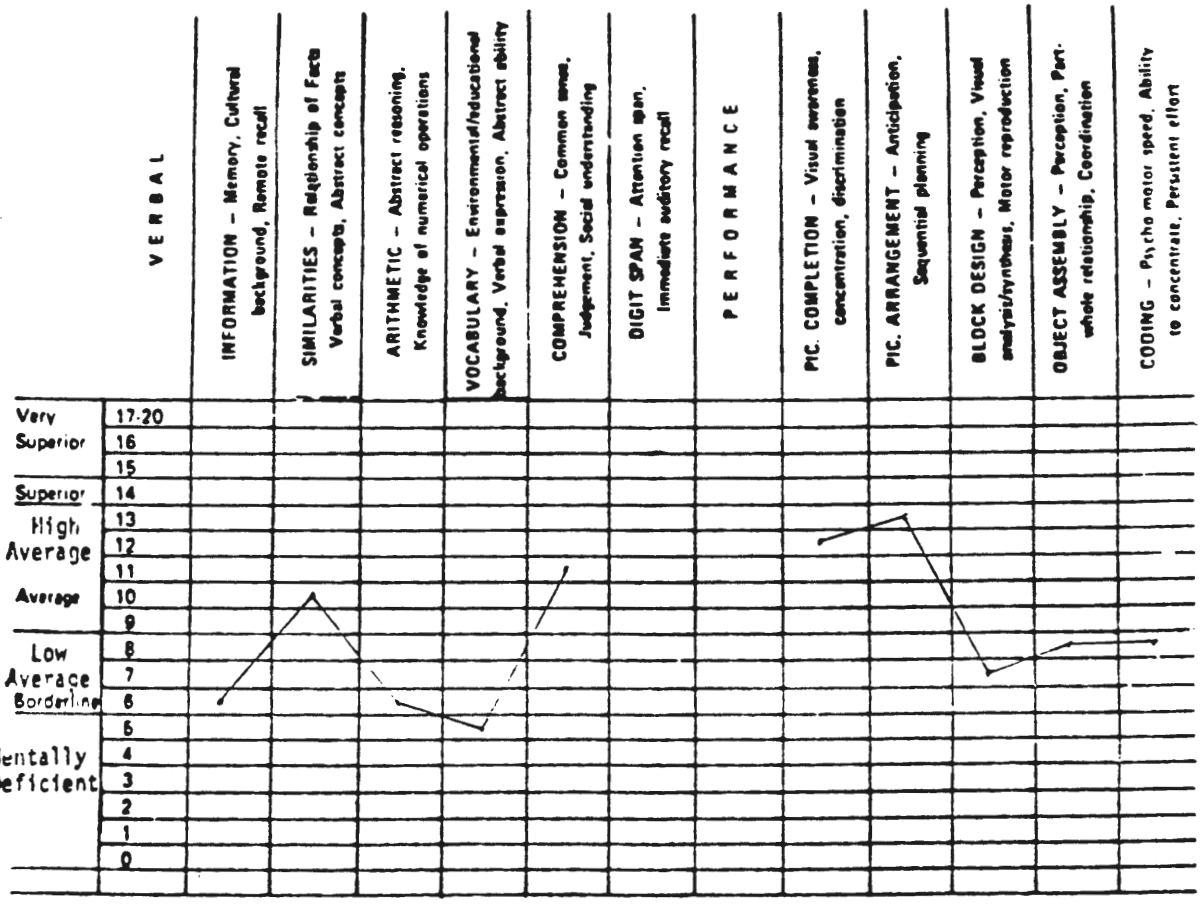
NAME Subject 1 AGE 8yrs.10mos. GRADE 2 B.D. 7-7-75

TESTS ADMINISTERED AND STATISTICAL RESULTS

_____ Wechsler Intelligence Scale for Children — Verbal I.Q. 85 — M.A. _____

_____ Wechsler Adult Intelligence Scale — Performance I.Q. 96 — M.A. _____

X Wechsler Intelligence Scale for Children (Revised) — Full Scale I.Q. 89 — M.A. _____



VERBAL SUBTESTS

SUBTEST	R.S.	S.S.	M.A.	
Information	8	6		
Similarities	10	10		
Arithmetic	7	6		
Vocabulary	15	5		
Comprehension	15	11		
Digit Span	( )	( )	( )	( )

PERFORMANCE SUBTESTS

SUBTEST	R.S.	S.S.	M.A.	
Picture Completion	18	12		
Picture Arrangement	29	13		
Block Design	10	7		
Object Assembly	15	8		
Coding	29	8		

CONFIDENTIAL

School _____ Test Date 1-5-87

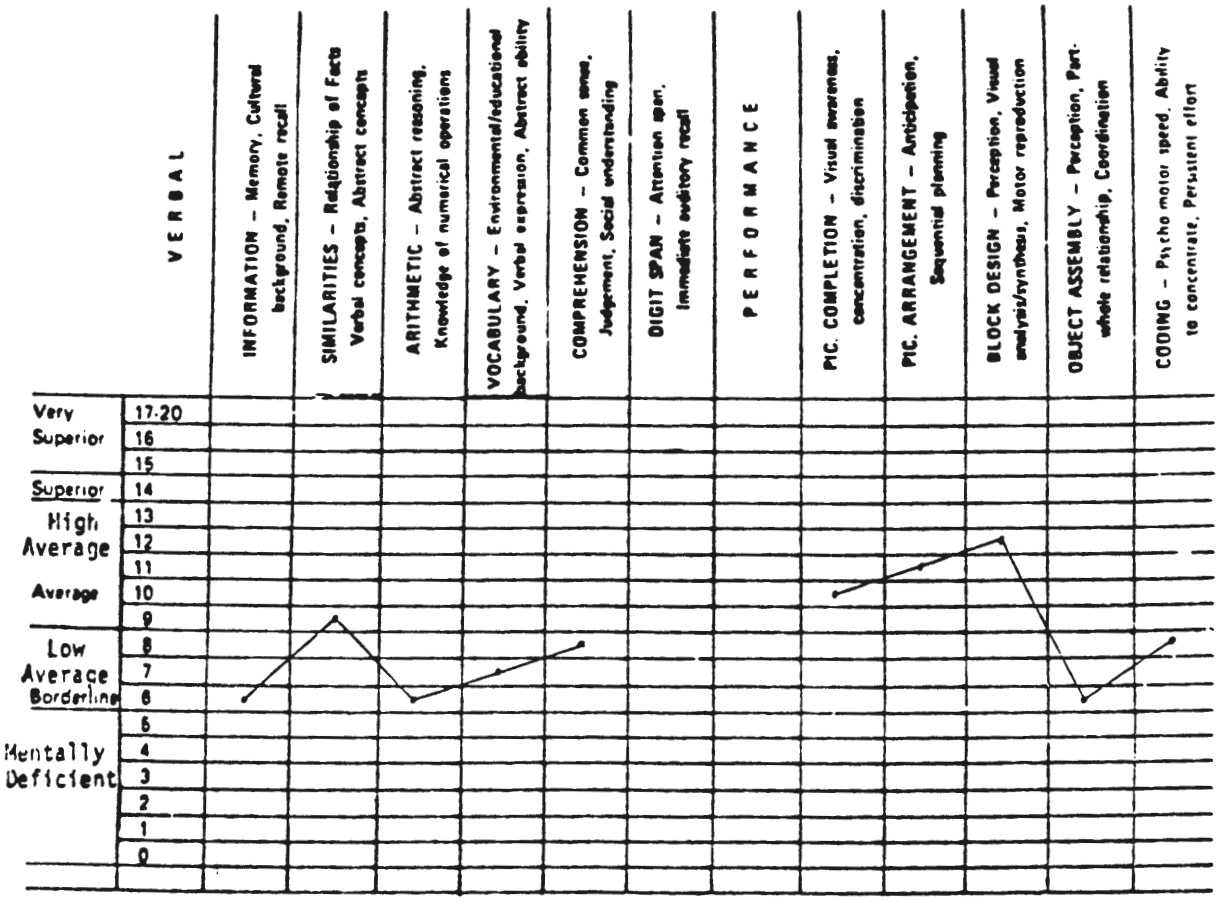
NAME Subject 2 AGE 9yrs.7mos. GRADE 3 B.D. 5-31-77

TESTS ADMINISTERED AND STATISTICAL RESULTS

_____ Wechsler Intelligence Scale for Children — Verbal I.Q. 82 — M.A. _____

_____ Wechsler Adult Intelligence Scale — Performance I.Q. 95 — M.A. _____

X Wechsler Intelligence Scale for Children (Revised) — Full Scale I.Q. 87 — M.A. _____



VERBAL SUBTESTS

SUBTEST	R.S.	S.S.	M.A.	
Information	9	6		
Similarities	10	9		
Arithmetic	8	6		
Vocabulary	20	7		
Comprehension	12	8		
Digit Span	( )	( )	( )	( )

PERFORMANCE SUBTESTS

SUBTEST	R.S.	S.S.	M.A.	
Picture Completion	17	10		
Picture Arrangement	27	11		
Block Design	28	12		
Object Assembly	12	6		
Coding	32	8		

CONFIDENTIAL

School _____ Test Date 9-18-85

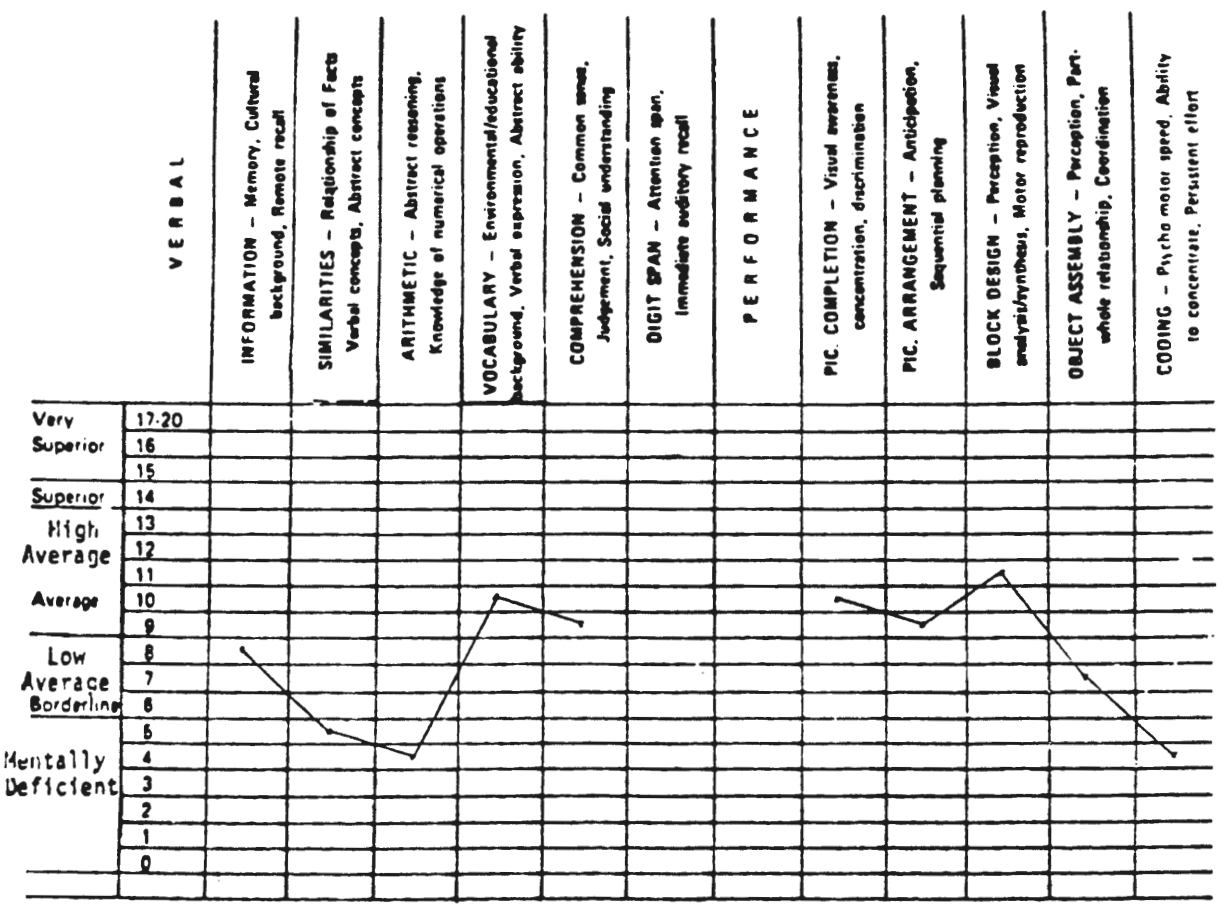
NAME Subject 3 AGE 10yrs,9mos GRADE 4 B.D. 12-11-74

TESTS ADMINISTERED AND STATISTICAL RESULTS

_____ Wechsler Intelligence Scale for Children — Verbal I.Q. 82 — M.A. _____

_____ Wechsler Adult Intelligence Scale — Performance I.Q. 87 — M.A. _____

X Wechsler Intelligence Scale for Children (Revised) — Full Scale I.Q. 84 — M.A. _____



VERBAL SUBTESTS

SUBTEST	R.S.	S.S.	M.A.	
Information	12	8		
Similarities	8	5		
Arithmetic	7	4		
Vocabulary	31	10		
Comprehension	17	9		
Digit Span	( )	( )	( )	( )

PERFORMANCE SUBTESTS

SUBTEST	R.S.	S.S.	M.A.	
Picture Completion	18	10		
Picture Arrangement	24	9		
Block Design	31	11		
Object Assembly	17	7		
Coding	26	4		

CONFIDENTIAL

School _____ Test Date 11-7-84

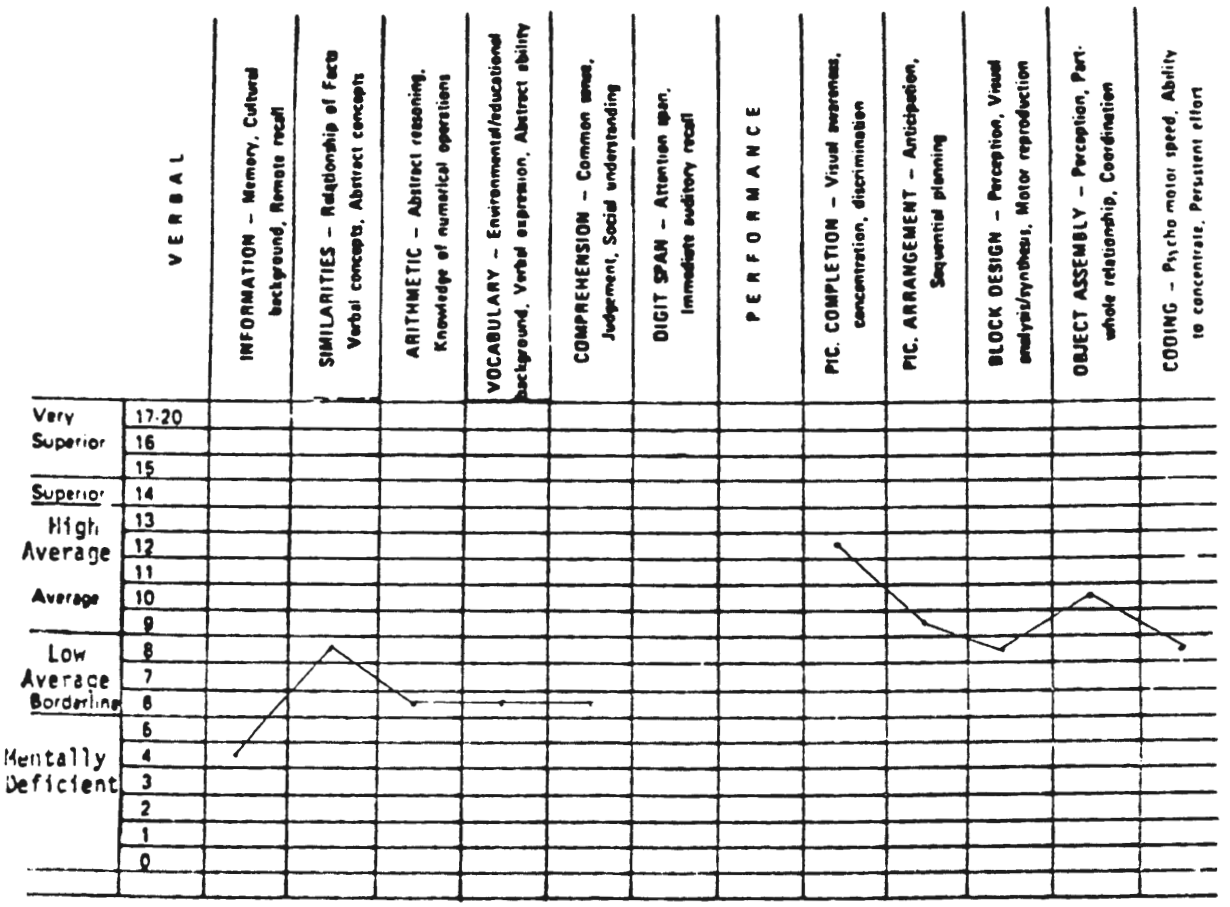
NAME Subject 4 AGE 10yrs, 3mos GRADE 4 B.D. 8-9-74

TESTS ADMINISTERED AND STATISTICAL RESULTS

_____ Wechsler Intelligence Scale for Children — Verbal I.Q. 75 — M.A. _____

_____ Wechsler Adult Intelligence Scale — Performance I.Q. 93 — M.A. _____

X Wechsler Intelligence Scale for Children (Revised) — Full Scale I.Q. 83 — M.A. _____



VERBAL SUBTESTS

SUBTEST	R.S.	S.S.	M.A.	
Information	8	4		
Similarities	10	8		
Arithmetic	8	6		
Vocabulary	21	6		
Comprehension	11	6		
Digit Span	( )	( )	( )	( )

PERFORMANCE SUBTESTS

SUBTEST	R.S.	S.S.	M.A.	
Picture Completion	19	11		
Picture Arrangement	21	9		
Block Design	18	8		
Object Assembly	21	10		
Coding	34	8		

CONFIDENTIAL

School _____ Test Date 9-22-86

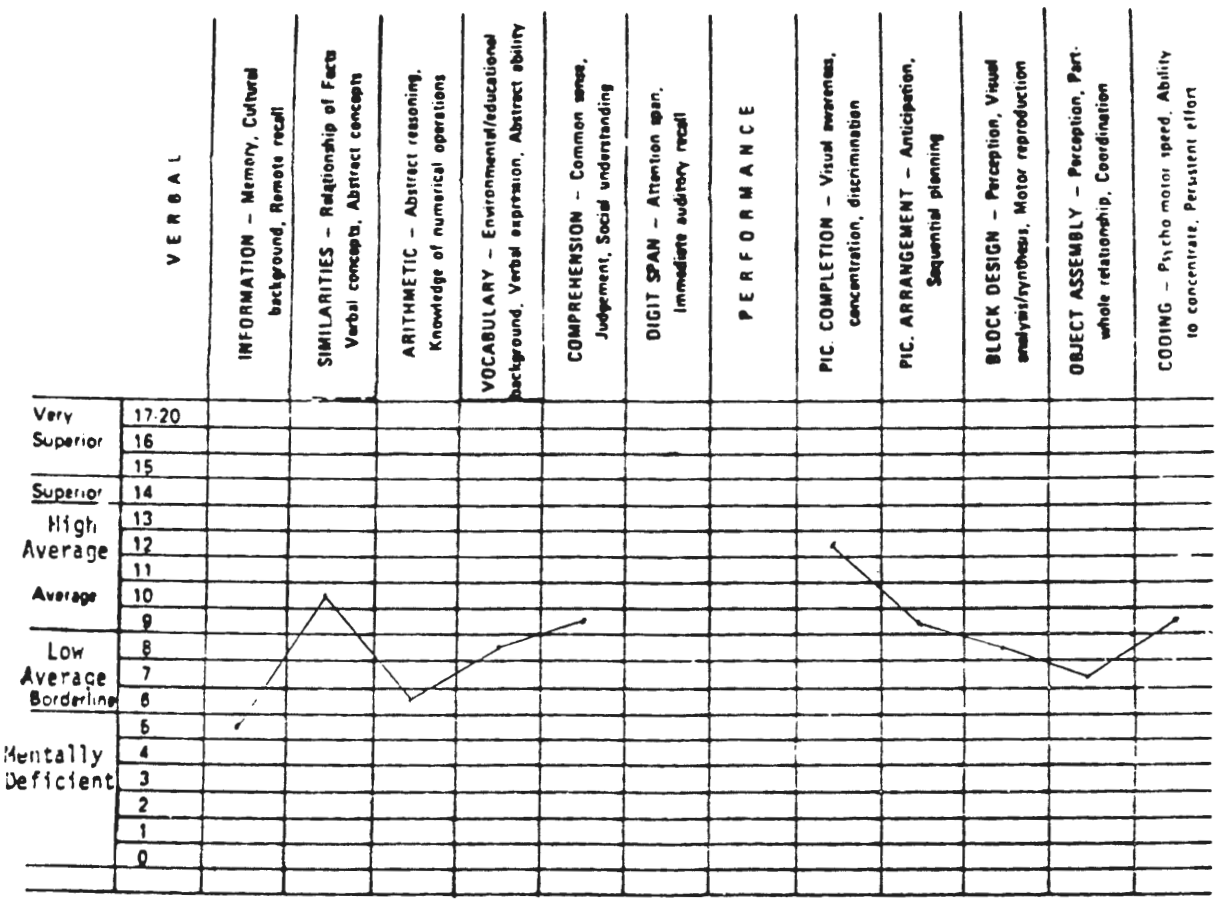
NAME Subject 5 AGE 10yrs.3mos GRADE 4 B.D. 6-2-75

TESTS ADMINISTERED AND STATISTICAL RESULTS

_____ Wechsler Intelligence Scale for Children — Verbal I.Q. 85 — M.A. _____

_____ Wechsler Adult Intelligence Scale — Performance I.Q. 92 — M.A. _____

X Wechsler Intelligence Scale for Children (Revised) — Full Scale I.Q. 87 — M.A. _____



VERBAL SUBTESTS

SUBTEST	R.S.	S.S.	M.A.	
Information	9	5		
Similarities	13	10		
Arithmetic	9	6		
Vocabulary	26	8		
Comprehension	16	9		
Digit Span	( )	( )	( )	( )

PERFORMANCE SUBTESTS

SUBTEST	R.S.	S.S.	M.A.	
Picture Completion	20	12		
Picture Arrangement	22	9		
Block Design	17	8		
Object Assembly	16	7		
Coding	38	0		

APPENDIX B

GARLAND INDEPENDENT SCHOOL DISTICT'S APPROVAL LETTER

GARLAND INDEPENDENT SCHOOL DISTRICT

ADMINISTRATION BUILDING
720 STADIUM DRIVE
P.O. BOX 461547
GARLAND, TEXAS 75046

Department of Planning,
Research and Evaluation

March 20, 1987

Michelle Mizell Herzer
6031 Pineland #1808
Dallas, Texas 75231

Dear Ms. Herzer:

The research council has concluded its evaluation of your application to conduct a research study in the Garland Independent School District. It is with pleasure that I inform you that the council approved your study, "Can Primary Language Disorders Be Identified in Slow Learning Children?"

You may begin data collection activities in our district beginning immediately. Notify my office in writing of the dates when you will conduct your data collection and the date on which it will be concluded. Dr. Gladys Williams will be your contact person in the district and will assist you by coordinating data collection. You should inform the subjects that your research project has been approved by the Planning, Research, and Evaluation Department.

Speaking for the research council, I wish you the best of success in your research efforts and look forward to receiving a copy of your report. Upon completion, a copy of your findings should be filed with the Planning, Research, and Evaluation Department. If I may assist in any way, please contact me.

Sincerely yours,

Michael W. Strozeski, Ph.D.

MWS/adg

APPENDIX C

GARLAND ALTERNATIVE FOR INDIVIDUAL NEEDS OF STUDENTS (GAINS) PLACEMENT FORM

STATE GUIDELINES FOR ALTERNATIVES TO SOCIAL PROMOTION

Texas Administrative Code, Section 75.195:

(a) Students shall be promoted from one grade to the next only on the basis of academic achievement as set forth in Section 75.193(a) of this title (relating to Grade Level Advancement and Course Credit).

(b) Section (b) of this administrative code provides alternatives for students in the elementary grades who are not meeting the established standards.

(1) The student may be required to repeat the grade level. No student shall be required to repeat any grade level more than one time. No student in the elementary school shall be required to repeat any grade level if the student has repeated two different grades previously.

(2) The student shall be encouraged to participate in tutorials.

(3) A student may be placed, not promoted, in the next grade level if it has been determined that the student is achieving to his/her maximum ability.

(4) A student may be placed in the special remedial category by the committee if at least three of the four criteria stated below are met.

GARLAND PLAN FOR INDIVIDUALIZED INSTRUCTION
GARLAND ALTERNATIVE FOR INDIVIDUAL NEEDS OF STUDENTS (GAINS)

Referral Data

Student _____ Age _____ Birthdate _____

School _____ Grade _____

Parent _____ Address _____ Phone _____

Person Initiating Referral _____ Date _____

This student does does not (circle one) meet eligibility criteria for special education. Students meeting special education eligibility criteria do not qualify for the individualized program.

To qualify for the individualized instructional program, the student must meet three of the four following criteria but must include at least one component of criterion number one (1).

1. Specific factors over which the student has no control that are limiting the student's achievement.

   • IQ range between 70–89

   Name of Test _____ Date _____

   Individual test _____ Group test _____

   SCORES: Verbal _____ Non-verbal _____ Quantitative _____ Composite _____

   (Record available scores. Use most recent scores.)

   If the test is a group test, the verbal score will be used for the English Language Arts program and the quantitative score for math. If the test is an individual test, the full scale score will be used.

   • Limited English Proficient ____ Yes ____ No

   (If there is no record of academic history available and if it is determined that the student could not perform satisfactorily in grade level essential elements because of limited English proficiency, the student could be placed until adequate language skills are acquired. Placement would be immediate and based on the assumption that the student could not perform on the achievement tests, TEAMS, and class work because of LEP.)

E-981 (9/27/85)
Page 1

1. White 2. Canary

• Developmental ages delayed more than one standard deviation below the chronological age (mean score) in the two areas

• Name of test _____ Birthdate _____ Age: Year ____ Month ____

• Scores: Psy. ____.____ Aud. ____.____ Vis. ____.____ Lang. ____.____ Motor. ____.____
(Record age equivalents and circle delayed areas.)

II. Performance on norm referenced achievement test below 40th percentile

Name of test _____

Reading composite including all reading sub-tests and vocabulary _____

and/or

Math composite _____

III. History of non-performance and failing grades (below 70)

check one: ____ based on current grade level essential elements
____ performed below grade level as reported last year

	Reading	Math
Yearly grade average last year	_____	_____
and/or		
Grade average current year (minimum 2 six weeks)	_____	_____

IV. History of non-mastery on Texas Assessment of Basic Skills (TABS) or on the Texas Educational Assessment of Minimum Skills Test (TEAMS) below 70% of objectives tested

Circle one: TABS/TEAMS Year _____

Reading:	# of objectives tested	_____
	# of objectives mastered	_____
Math:	# of objectives tested	_____
	# of objectives mastered	_____

RECOMMENDATION FOR PLACEMENT IN GAINS

_____	_____	_____	_____
Principal	Yes	No	Date
_____	_____	_____	_____
Teacher	Yes	No	Date
_____	_____	_____	_____
Counselor or Teacher	Yes	No	Date

Students who are placed in this program may be retained in the same grade level if it is determined appropriate for the student.

Parent/Guardian Signature _____ Date _____

OR

Parent notified by letter _____ Date _____

Parent notified by telephone _____ Date _____