Evaluating the Aural/Oral Skills of Children Identified by the Slingerland Pre-Reading Screening Procedures

Sandra L. Singleton

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EVALUATING THE AURAL/ORAL SKILLS OF CHILDREN IDENTIFIED BY THE SLINGERLAND PRE-READING SCREENING PROCEDURES

by Sandra L. Singleton

Research tends to confirm the concept that it is imperative to diagnose learning disorders early and start remediation immediately. Slingerland (1977) developed an assessment tool, which reportedly aids in the identification of remedial needs before a child has experienced failure. This screening device was designed to "show modality weaknesses that call for specific instruction to prevent early failure" (Slingerland, 1977). All of the subtests from the Pre-Reading Screening Procedures are cross-modality tasks because the testing of a modality, "Auditory" or "Visual," requires the use of one or two other modalities (motor or speech) to generate a response. In order to determine whether children who failed Slingerland's cross-modality tasks did so because of basic aural/oral processing difficulties, thirty-six kindergarten students were evaluated with the Slingerland screening device. One-third of those subjects obtained ratings of "Below M" on the screening test, identifying them as subjects for this study. These twelve subjects were then evaluated with eight tests from commercially-produced assessment instruments chosen to provide purely aural/oral tasks, uncontaminated by visual-graphic stimuli.

The results found that eight of the twelve subjects failed at least one of the eight subtests, thereby implying that basic auditory processing difficulties are related to the failing of the Slingerland
Pre-Reading Screening Procedures. Analysis of the results found that, on only one subtest, the majority of children scored at or above the mean performance level of children of kindergarten age. All the other subtests revealed the subjects' auditory skills to be below average for chronological age.
EVALUATING THE AURAL/ORAL SKILLS OF CHILDREN IDENTIFIED BY THE SLINGERLAND PRE-READING SCREENING PROCEDURES

by

Sandra L. Singleton

A Thesis in Partial Fulfillment of the Requirements for the Degree Master of Science in Speech-Language Pathology

April 1982
Each person whose signature appears below certifies that this thesis in his/her own opinion is adequate, in scope and quality, as a thesis for the degree Master of Science.

Melvin S. Cohen, Associate Professor of Speech Pathology

E. Evelyn Britt, Associate Professor of Speech Pathology and Audiology

Grenith Zimmerman, Professor of Biostatistics
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Chapter 1

NATURE AND SCOPE OF THE PROBLEM

Introduction

Traditionally, the child who is considered as having a learning disability is identified after exhibiting difficulty in reading, writing, or attending to the teacher. In order to receive remediation, that child must first begin to fail in academic endeavors. This "failure" often does not show up until the end of second grade or during the third-grade year when all of the elementary skills necessary for learning are required to come together to provide an effective and reliable strategy for knowledge acquisition.

The primary teacher is usually the first person to identify the child with learning disabilities, but this identification comes after the child has failed to learn for a considerable period of time. At the kindergarten level where the child begins his school career, the ability to recognize the child with potential learning disabilities would be invaluable in eliminating the possibility of future problems in academic learning for the child (Haring and Ridgway, 1967).

As reported in Tarnopol (1969), Illg and Ames (1967), of the Gesell Institute of Child Development at Yale University stated, within the next few years we hope that many public schools will recognize the fact that possibly as many (in our estimation) as one-third of the students are perceptually handicapped to some degree or other, and can and should be given specific help and training, within the school situation. Third grade is too late. By that time a child who is perceptually handicapped can be messed up good and plenty.
Research seems to confirm the concept that it is imperative to diagnose the learning disability early and start remediation immediately. A child whose learning disability is identified before he starts reading instruction in the first grade and who is given proper habilitative help has a much greater chance of learning and thereby avoiding the emotional problems which could affect a child diagnosed only after frustration already has set in. The earlier the diagnosis, the better the prognosis (Tarnopol, 1969).

Slingerland (1977) developed an assessment tool which reportedly aids in the identification of remedial needs before a child has experienced the failure syndrome. The instrument consists of a battery of subtests entitled *Pre-Reading Screening Procedures to Identify First Grade Academic Needs*.

According to Slingerland:

The purpose of the Pre-Reading Screening Procedures is to find among children . . . the ones who show difficulties in auditory, visual, and/or kinesthetic modalities that often indicate Specific Language Disability (SLD). Possible difficulties in initially learning to read, write, and spell, in verbalizing, and eventually in written expression may be indicated by short attention span, by questionably understood or expressive language development--by faulty perception and recall of visual or auditory symbols, by avoidance of or lack of facility with activities that require fine muscular coordination, and by clumsy or awkward pencil grip, any or all of which should not be disregarded when an overall evaluation of each individual is made (1977).

The intent of a screening device usually is to provide an effective way to find the children who may need additional diagnosis and possible treatment. Slingerland, however, suggests that, based on the results of her screening test, sufficient information is available to
begin a program designed to avert failure through instruction aimed at remediation of the specific modality weaknesses.

Because Slingerland is a proponent of a multi-sensory program, she adapted to classroom use the Orton-Gillenham multi-sensory approach to language arts remediation. Her screening device was designed to "show modality weaknesses that call for specific instruction to prevent early failure" (Slingerland, 1977).

All of the subtests from the Pre-Reading Screening Procedures are crossed modality tasks. The subject is provided with either an auditory or visual stimulus, and is required to at least visually scan the test booklet and produce a simple motor response, such as a crayon mark. Therefore, each input modality tested, whether "Auditory" or "Visual," requires the use of one or two other modalities for generation of a response. Regardless of the title of a specific Procedure within the Slingerland screening device, the particular modality in need of remediation may not be clearly identified.

When sensory systems are discussed with regard to learning disabilities, the receptive modalities referred to usually are the auditory and visual channels. Myklebust (1964) stated that children with learning disorders can have unequal deficiencies of sensory modalities; that is, a child may have a severe deficiency of auditory abilities with only mild impairment of visual skills (Doehring and Rabinovitch, 1969).

If the assessment stimuli presented involve only one sensory channel, intra-sensory integration is required of the brain to process the information. If the stimuli involve more than one sensory system, inter-sensory integration is needed to process the incoming message
into meaningful information. Furthermore, it may be assumed that inter-modality integration occurs where the stimulus is auditory and the response is oral/motor or when the stimulus is visual and the response is graphic/motor.

According to Cravioto, DeLicardie, and Birch (1966), the ability to perform intersensory integrations is of a higher order neurologically than intrasensory integrations, and Birch and Belmont (1966) "predict that tasks involving crossmodal matchings will be more complex and difficult than intramodal discrimination involving the use of only one sensory modality at a time" (Cohen, 1973). Therefore it might be assumed that simple auditory/verbal (intra-modality) tasks should be easier to perform than the auditory/visual (inter-modality) integration tasks of the Slingerland device, or at least would show which of the systems (auditory/vocal or visual/graphic) is causing the breakdown to occur.

Keith's (1981) statement summarizes this investigator's concern. Basically, we are interested in knowing how a child learns through each sensory system. We try to ascertain whether the child can perceive, remember and interpret what he or she hears. In our work we have observed that some children are overloaded by multi-sensory inputs. Researchers and diagnosticians should note the number of sensory systems required to perform tasks, particularly those tasks which purport to assess some process within a single sensory channel. For example, certain auditory discrimination tests require the child to point to pictures. Often these are very appropriate, particularly for children who cannot handle a comparison task. On the other hand, a failure may be due to auditory processing disorders, visual processing disorders such as difficulties with picture interpretation, or cross modal disorders.
Statement of the Problem

One reason why children fail the Slingerland Pre-Reading Screening Procedures may be that they are experiencing not only intersensory (auditory/visual) integration difficulties, but also intrasensory (auditory/vocal) integration problems.

The Null Hypothesis

It was hypothesized that children who have failed the Slingerland auditory/visual integration tasks will not demonstrate any difficulties with tests which involve only aural/oral stimulus-response tasks.

The Alternative Hypothesis

It was hypothesized that children who fail the Slingerland auditory/visual integration tasks will fail at least one of the eight aural/oral subtests administered by this investigator.

Purpose of the Study

The purpose of the present study was to evaluate, with intra-modal aural/oral subtests selected from diagnostic batteries, those children who have failed the intersensory auditory/visual Slingerland tasks. The study was designed to determine whether children with auditory/visual intersensory integration difficulties also experience basic difficulties with aural/oral intrasensory processing.
Importance of the Study

The terms auditory-perceptual and auditory-processing disorder have been used to describe children with normal peripheral auditory function and normal to near-normal intelligence, whose difficulties are usually manifested in poor performance on clinical tests which measure auditory memory, temporal sequencing, figure-ground, closure and discrimination (Tobey, Cullen, and Rampp, 1976). In 1974 a study committee for the United States Office of Education, headed by Joseph Wepman, defined "learning disability" as essentially a problem of perception and a perceptual disorder (Cruickshank, 1975).

The Wepman Committee defined children with learning disabilities as:

those of any age, who demonstrate an inadequate ability in functions such as recognizing fine differences between auditory and visual discriminating features underlying the sounds used in speech and orthographic forms used in reading; retaining and recalling those discriminated sounds and forms in both short and long memory; ordering the sounds and forms sequentially both in sensory and motor acts . . . recognizing spatial and temporal orientations; distinguishing figure-ground relationships; obtaining closure . . . ; integrating intersensory information; (and) relating what is perceived to specific motor information" (Cruickshank, 1975).

Although intersensory integration improves with age, Birch and Belmont suggest that intermodal tasks are more difficult than those which are intramodal. Results of research indicated that a group of kindergarten children could perform only slightly better than chance on a task of treating auditory and visual stimuli as equivalent. The development of such integrations is particularly important in making the child ready for formal learning (Birch and Belmont, 1965).
Summary

If the previously-stated definitions of auditory processing disorder and learning disability are accepted, there appears to be a need to closely examine children who fail reading readiness screening devices in order to identify the underlying areas of difficulty. The present study was undertaken to determine whether similarities exist between auditory/verbal and auditory/visual processing; the presence of such a relationship would tend to indicate that children exhibiting difficulties on tasks from Slingerland's Pre-Reading Screening Procedures should receive a battery of tests designed to identify the specific underlying modality in need of remediation.

The current direction of instruction for those children indicating modality integration disabilities is to attend primarily to the areas of stronger ability. This usually translates to a program using visual stimuli, with auditory stimuli used only as support in the process of teaching. This occurs because the goal of instruction in the first school years is to develop good reading (a "visual" skill). The results of this study may indicate the need for a change in emphasis during remediation from "teaching to the strength" to "teaching to the weakness," particularly if it is found that the weakness lies with the auditory modality.

Definition of Terms

Aural-Oral Skills

This will encompass terms such as auditory perception, auditory conceptualization, auditory processing and auditory skills, all of which
are used interchangeably in much of the literature to refer to abilities such as sound blending, discrimination of phonemes, auditory closure, auditory memory and auditory comprehension (Keith, 1981).

**Auditory Association**

The ability to relate concepts which are presented orally (Kirk, McCarthy, and Kirk, 1968).

**Auditory Closure**

The ability to fill in missing parts of a word which were deleted in auditory presentation and to produce a complete word (Kirk, McCarthy and Kirk, 1968).

**Auditory Discrimination**

The ability to discern between sounds of different frequency, intensity, and pressure-pattern components; the ability to distinguish one speech sound from another (Travis, 1971).

**Auditory Memory Span**

The number of related or unrelated items that can be recalled immediately after hearing them presented (Travis, 1971).

**Auditory Reception**

The ability of a child to derive meaning from verbally presented material (Kirk, McCarthy and Kirk, 1968).

**Auditory Sequencing**

The ability to perceive the identity, number and order of sounds in spoken patterns (Lindamood, 1980).
Auditory/Visual Intersensory Integration

The liaison of information arriving as inputs from different sensory modalities (Cohen, 1973).

Intramodal Integration

The blending of an incoming stimulus from one sensory channel with the production of a response through a related output channel (i.e., hearing and speaking).

Intermodal Integration

The blending of an incoming stimulus from one sensory system with the production of a response through a non-related output (i.e., hearing and writing) (Cohen, 1982).

Learning Disability

A specific retardation or disorder in one or more of the processes of speech, language, perception, behavior, reading, spelling, writing or arithmetic (Kirk, 1972).

Modality

A sensory system, such as hearing or seeing or a motor channel, such as speaking or writing.

Non-Propositional

The use of linguistic symbols with no communicative or intellectual intent (Berry and Eisenson, 1956).
Pre-Reading Skills

In preparation for reading a child must develop many abilities. They include adequate peripheral hearing and visual acuity; visual and auditory discrimination abilities; adequate attention span; willingness and ability to attend; cognitive development in relevant knowledge; comprehension; quantitative thinking; word association; story sequence concepts; and extension of vocabulary (Zintz, 1970).

Propositional

The use of linguistic symbols to communicate a specific idea or elicit a specific response. Not only the words, but the manner in which words are related and refer to one another within the unit becomes important. The words are related to one another and to the situation in which they are used (Travis, 1971).

Sound Blending

The ability to synthesize parts of a word and produce an integrated whole (Kirk, McCarthy and Kirk, 1968).
Chapter 2

REVIEW OF THE LITERATURE

Early Detection and Intervention

Research seems to support the concept that it is important to diagnose and begin to habilitate children with learning disabilities as early as possible, preferably before they are expected to start learning to read in the first grade (Tarnopol, 1969). Gillinham, in 1956, wrote,

The idea dawned upon me a good many years ago that if there were some way by which we could select the language disability children who were going to have trouble with reading later on, and teach them by the appropriate technique, we might save them from the heartache and frustration, and their parents from the anxiety and expense that is now met when the child is experiencing reading problems (Childs, 1968).

Slingerland, a student of Gillinham, designed the Pre-Reading Screening Procedures "based on the premise that early screening can identify specific language disabilities before they (children) begin to read--and before they begin to fail. These children are often overlooked until failure or inadequate performance sets them apart" (Slingerland, 1977).

The Slingerland screening device proposes to identify children who indicate a need for multi-sensory preventative instruction. The Slingerland instrument is intended to identify those whose individual

1Slingerland's emphasis
performance indicates modality weaknesses that call for specific in-
struction to prevent early failure (Slingerland, 1977).

Sensory Modalities and Learning

If learning is to progress beyond minimum levels of mastery, the child must be able to process information from a single modality (intrasensory development), as well as from multiple-modalities (intersensory development), and he must be able to do this with a high degree of consistency and efficiency. Such capacities improve with age and experience (training), and are important to effective learning. For example, children with developmental lags or with specific learning disabilities often demonstrate inefficient information pick-up and analysis (Temple, Williams, and Bateman, 1979).

A primary disturbance in the ability to integrate stimuli from the two critical sense modalities, hearing and vision, may well serve to increase the risk of becoming a poor reader. Research strongly suggests that the ability to treat visual and auditory patterned information as equivalent is one of the factors that differentiates good from poor readers (Birch and Belmont, 1964). According to Hardy (1967), both the clinical and research evidence support the concept that the sensory systems are closely interlinked and that breakdowns in the management of intersensory information seem to underlie the more common language disorders (Tarnopol, 1969).

Significance of Auditory Modality Skills to Learning

Myklebust (1960) suggested a hierarchical scheme by which language develops. He stated that a child first gains experience, then evolves through (1) development of inner language or meaning,
(2) comprehending the spoken word (auditory receptive language), (3) speaking (auditory expressive language), (4) reading (visual receptive language), and (5) writing (visual expressive language). Thus, auditory language comes first, and when a child is learning to read and write, he superimposes the visual language on the already-acquired auditory language (Kirk, 1972).

Deficiencies in dyslexic children may be related to an auditory involvement rather than to intersensory difficulties (Tarnopol, 1969). Success in the reading process is dependent upon the normal function of several auditory factors. Children's specific difficulties in auditory perception create academic failure in the elementary grades, primarily attributable to failure to learn the reading process (Rampp, 1976). Children with auditory processing problems exhibit difficulty in acquiring the basic language skills necessary for academic success. A child with speech and language deficiencies that are the result of auditory processing problems often goes unrecognized, maybe misunderstood, or is incorrectly diagnosed until he or she is much older and is firmly embedded in academic failure (Semel, 1976). It is now generally accepted in special education that faulty auditory perception is one of the basic causative factors of learning disabilities (Kratoville, 1968; Tarnopol, 1969).

**Aural/Oral Tasks**

**Auditory Discrimination**

Dykstra (1966), having reviewed several investigations of auditory discrimination and reading ability, concluded that good readers
are superior to poor readers in auditory discrimination. Among the kinds of auditory abilities in which poor readers were found deficient were the discrimination of word pairs, speech sounds, rhymes, vowels and consonants (Doehring and Rabinovitch, 1969).

Children with auditory language disabilities (difficulties in comprehension of spoken language) often need special training in discrimination. The child must be able to hear differences between and among complex sounds which vary with respect to individual pitch, quality and intensity characteristics (Tarnopol, 1969). Flowers and Costello (1970) define the discrimination function as the ability by which the hearing organism is able to distinguish among various sound entities and/or factors; be they gross sounds of little meaning or complex sounds such as words requiring discrimination of phonemes.

Ideally, the focus of most auditory discrimination testing should be at the preschool and primary age levels (Goldman, Fristoe, and Woodcock, 1970). The factor of auditory discrimination has been found predictive of reading and speech performance in lower elementary grades (Lindamood, 1980).

Auditory Memory

Auditory memory span is the capacity for the temporary retention of a sequence of acoustical events. It is especially important in the perception and acquisition of language with its uniquely sequential and temporal qualities. Eisenson (1966) refers to the common finding of impaired auditory memory span in children with language disorders (Flowers and Costello, 1970).
The role of defective auditory memory in learning disabilities was noted more than 60 years ago by Bronner and Henshelwood (1917). In more recent years this finding has been consistently verified (Haring and Ridgway, 1967).

Every facet of the language process is dependent to some degree on memory. Many children with neurogenic learning disorders are limited to the amount of information they can remember at any one time (Tarnopol, 1969).

**Auditory Sequential Memory**

Sounds, words, phrases and sentences are generally not heard or learned in isolation; they are used in relation to other sounds, words, phrases and sentences. Accurate auditory sequencing requires that the child analyze a series of sounds and words or a rhythmic pattern and synthesize the sounds and patterns into correct order (Semel, 1976).

In order to recognize and correct errors there is a need for an auditory conceptual judgment. This is the ability to perceive the identity, number and sequence of speech sounds in spoken patterns, and to perceive how and when patterns are different (Lindamood, 1980).

The determination of a child's readiness for learning to speak or read accurately is dependent to some degree upon the number of items he can hold in mind for immediate retrieval and use. All verbal forms of communication have an inviolate order whether it be in the phonemes used in speech, the letters used in reading, the words in language, or
the numbers used in computation. Sequential memory is reflective of all these aspects of communication (Wepman, 1973).

Auditory Closure

Auditory closure is the ability to anticipate and supply missing sounds, word parts, or words through contextual cues. If, through hearing the rest of the sentence, children cannot supply the missing parts, they are likely to have problems understanding people who speak too rapidly; teachers who give directions while facing the chalkboard; or all speech directed at them against a background of static, blaring music or other noises (Semel, 1976).

Auditory Synthesis
(Sound Blending)

The results of research by Conners, Kramer and Guerra (1969) suggest that low achieving grade school children are deficient in the ability to blend sounds into words. According to Semel (1976), many children with auditory processing problems have difficulty blending sounds into words.

Goldman, Fristoe and Woodcock (1976) state that many reading specialists believe that sound blending is a critical skill underlying the ability to apply phonic skills to identification of a word that is unfamiliar in print, but is part of one's receptive, or listening, vocabulary. Auditory synthesis is closely related to auditory analysis.

Auditory Analysis

Analysis is the process of extracting sounds from whole words.
Some children have difficulty identifying separate sounds within the whole words (Semel, 1976).

Sound analysis skills require the ability to recognize sequence and identify where each sound belongs in that sequence. These skills are of particular importance in learning to spell and in learning phonic skills in reading (Goldman, Fristoe and Woodcock, 1976).

**Commercially-Produced Assessment Instruments**

All of the commercially-produced aural/oral tests currently available for the study population were reviewed. These instruments are standardized and are reported to provide significant information when developing a diagnosis for educational need intervention.

The subtests were divided into two groups, non-propositional and propositional. They are as follows.

**Non-Propositional**

*Goldman-Fristoe-Woodcock Auditory Skills Test Battery.* Sound Symbol Tests were designed to identify subjects who are deficient in certain sound-symbol skills, and to describe this deficiency. They are intended to measure several basic abilities which are prerequisite to advanced language skills, including reading and spelling (Goldman, Fristoe, and Woodcock, 1976).

1. **Sound Mimicry Test** measures the ability to imitate syllables.
2. **Sound Analysis Test** measures the ability to isolate and identify consonant sounds in syllables.
Propositional

The Auditory Sequential Memory Test (Wepman and Morency, 1973). This test measures the ability to immediately recall a given set of numbers in correct order.

The Auditory Memory Span Test (Wepman and Morency, 1973). This test measures the ability to immediately recall a given set of words.


1. Auditory Reception subtest measures the ability to derive meaning from verbally-presented material.

2. Auditory Closure subtest measures the ability to fill in missing parts of a word presented aurally and to orally produce the completed word.

3. Auditory Association subtest measures the ability to relate orally-presented concepts.

Goldman-Fristoe-Woodcock Auditory Skills Battery. Sound Blending measures the ability to integrate isolated sounds into meaningful words.

Haskins' Kindergarten Phonetically Balanced Words (Martin, 1975). This subtest provides a measure of auditory discrimination at the single-word level, and is intended to test the adequacy of the peripheral hearing system.

Detroit Tests of Learning Aptitude (Baker and Leland, 1967). The Auditory Attention Span for Related Syllables test measures the auditory attentive ability of the child.
Summary

The current review of the literature supports:

1. the need for early detection and habilitation of children with learning difficulties;

2. the importance of auditory processing abilities for the development of normal language and reading abilities; and

3. The necessity for age-appropriate aural/oral skills as a prerequisite for learning to read.
Chapter 3

RESEARCH DESIGN AND PROCEDURES

Subjects

Temecula Union School District in Temecula, California, has four kindergarten classrooms, all located at Vail Elementary School. Each kindergarten teacher was asked to refer to the Special Services Coordinator ten children from her class whom she has judged to be most in need of screening for potential pre-reading readiness skills difficulties. These children have English as their native language, and have passed hearing and vision screening examinations provided by the visiting school nurse.

The referred kindergarten-age children were randomly placed into four groups of ten children each, and evaluated by the Special Services Coordinator with the Slingerland Pre-Reading Screening Procedures.

The subjects of this study were those children who obtained a rating of "Below M" on the Slingerland screening device as determined by the rating chart from the Pre-Reading Screening Procedure's Teacher's Manual (Table 1).

Selected subtests from various assessment batteries were used to evaluate these subjects. The three Goldman-Fristoe-Woodcock subtests (Sound Mimicry, Sound Analysis and Sound Blending), the ITPA subtests (Auditory Reception, Auditory Association and Auditory Closure), and the two Wepman tests (The Auditory Memory Span Test and The Auditory
Table 1
Rating Chart

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<td>7-8</td>
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<td>M+</td>
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<td>Low</td>
<td>0-4</td>
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</table>

Sequential Memory Test), were chosen because they are readily available, commonly used in the public schools by speech/language specialists, and provide only auditory stimuli requiring only verbal responses. The intent of the study was to eliminate visual/graphic contamination of diagnostic material in an effort to provide the children with uninfuenced aural/oral tasks.

Haskins' Kindergarten Phonetically Balanced Word Lists (Martin, 1975) were eliminated because they require a controlled acoustic environment, which is usually not available in a public school setting. Also, the Auditory Attention Span for Related Words subtest of the Detroit Tests of Learning Aptitude (Baker and Leland, 1967) was not used due to the lack of published normative data for this age group.

**Methodology**

The children evaluated with the aural/oral subtests were assessed on a one-to-one basis in the speech/language specialist's
room, seated at a table and in a chair suitable in size for children in kindergarten.

Some of the tests required the playing of stimuli from a prerecorded cassette. The recording was played on a Hatachi cassette player, model number AVA 301, set at a "comfortably loud level" (Goldman, Fristoe and Woodcock, 1976). This "comfortably loud" level was determined by the examiner's asking the child, "Can you hear this?" "Is this too soft?" "Is this too loud?" This dialog was continued until a level was found that appeared to the child to be loud enough to hear the recording clearly, but not so loud as to be considered uncomfortable.

The following provides a description of the administrative procedures used for each subtest, and the criteria used for determining passing or failing. For those tests which did not report pass/fail cut-off score data, the 10th Percentile was used to determine the fail point. This criterion was supported by two sources. Mauberly's (1965) diagram of a normal distribution of Stanines, Percentile Ranks and Achievement Classifications shows that performances designated as "poor" and low "below average" fall below the 11th Percentile. The Bureau of Education for the Handicapped, in 1970, estimated that slightly over 10 percent of children in the United States were learning handicapped (Kirk, 1972).

**Goldman-Fristoe-Woodcock Auditory Skills Test Battery**

This test battery consists of 12 subtests. The following three were selected because they involve presentation of an aural stimulus
with an oral response. Scores below the 11th Percentile were considered failure.

1. **Sound Mimicry Test.** The examiner instructed the child to repeat nonsense words spoken to the subject by a recorded voice. The child was given sample items before the actual test items were administered.

2. **Sound Analysis Test.** The subject was instructed to repeat back to the examiner a certain part (first, middle, or last) of nonsense words presented, one at a time, by a recorded voice. Sample items were presented first. An example of instructions is, "What is the first sound in shif?" The child must respond with "sh."

3. **Sound Blending.** After being presented with a series of isolated phonemes, the subject was requested to respond with the words those phonemes represented if blended; for example, "/ae/.../k/.../s/" (axe); "/ai/.../s/" (ice).

**Illinois Test of Psycho-linguistic Abilities**

The ITPA subtests which were chosen did not require visual stimuli for a response, thus the following were appropriate for this study. Failure was a Scaled Score of less than 26 or 10 points below the subject's mean Scaled Score on the ITPA subtests administered, whichever was lower.

1. **Auditory Reception.** This test required the subject to respond with "yes" or "no" to orally presented questions such as "Do dogs eat?" "Do dials yawn?" "Do dresses sing?" Any indication of "yes" or "no" was acceptable.
2. **Auditory Closure.** This test presented to the child a word with certain sounds omitted. The examiner presented the word to the child with the same phonemes and stresses as used in the completed word, and the child was to respond with the whole word. Examples of test words are: "DA / Y" (daddy); "BO / LE" (bottle).

3. **Auditory Association.** The examiner read to the subject an incomplete analogy, stopping abruptly without dropping the voice to indicate that the sentence was not complete. The examiner then paused to allow the child to supply the final word. If the child completed the sentence by negating the initial statement, the examiner said "no" and repeated the analogy.

**Wepman Auditory Memory Tests**

The Wepman tests of auditory memory include one test of memory of content and one test of memory for content in sequence. Failure criterion for both tests was indicated by a score of "-2," based on the Standardization and Interpretation Table for each test.

**The Auditory Memory Span Test**

The examiner asked the child to repeat after the examiner a series of words presented with a one-half second pause between each word. The voice was dropped slightly on the last word of each series. The child was presented two trials to obtain a correct response. To be judged as correct, the child had to repeat all the words of a series in any order. An incorrect response occurred when a word was added or omitted.
The Auditory Sequential Memory Test

The child was asked to repeat back to the examiner a series of numbers presented by the examiner. The digits were presented at the rate of one per half-second, with the voice dropped slightly on the last digit of a series. After two sample items, the subjects were given two trials to correctly repeat a given series. A response was incorrect if numbers were added, omitted, or not repeated in correct order.
Eight subtests from commercially-produced assessment batteries were selected for administration to 12 kindergarten children to obtain a measure of their aural/oral skills. As shown in Appendix A, 67 percent of the children failed at least one of the subtests. The null hypothesis stated, "Children who have failed the Slingerland auditory/visual integration tasks will not demonstrate any difficulties with tests which involve only aural/oral stimulus/response tasks."

Using a \( z \) test it was shown that the proportion of children failing was significantly different from zero \((p<.01)\). These results support the alternative hypothesis which stated, "Children who failed the Slingerland auditory/visual integration tasks will fail at least one of the eight aural/oral subtests." This implies that the auditory component is at least contributory to the difficulties these subjects experienced with the Slingerland Pre-Reading Screening Procedures.

The ITPA subtests yielded the following results:

On the Auditory Reception Test (Figure 1), 17 percent of the subjects received a Scaled Score "Above Average," 67 percent scored within the "Average" range, and 17 percent scored in the "Below Average" area.

With the Auditory Association Test (Figure 2), 75 percent of the subjects scored within the "Average" range, with 25 percent scoring "Below Average."
Figure 1

ITPA Auditory Reception

Figure 2

ITPA Auditory Association
The Auditory Closure Test (Figure 3) revealed 83 percent scoring within the "Average" range, with 17 percent obtaining a Scaled Score which was "Below Average."

Figure 3
ITPA Auditory Closure
On the G-F-W Sound Blending Test (Figure 4), 33 percent of the subjects scored in the "Average" range and 67 percent scored "Below Average."
On the G-F-W Sound Mimicry Test (Figure 5), 33 percent scored within the "Average" range, and 67 percent of the subjects scored "Below Average" or "Poor."^{1}

![Bar graph showing percentile ranking for G-F-W Sound Mimicry test.]

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^{1} The factor of a particular subtest being propositional in nature vs. non-propositional did not appear to affect the subjects' resulting scores.
The G-F-W Sound Analysis Test (Figure 6) revealed 25 percent of the subjects scoring in the "Above Average" area, 58 percent scoring in the "Average" range, and 17 percent scoring "Below Average."¹

¹The factor of a particular subtest being propositional in nature vs. non-propositional did not appear to affect the subjects' resulting scores.
On the Wepman Auditory Memory Span Test (Figure 7) and the Wepman Auditory Sequential Memory Test (Figure 8), 42 percent of the subjects scored in the "Above Average" or "Average" range with 58 percent scoring "Below Average" or "Below Adequacy Threshold."

![Figure 7: Wepman Auditory Memory Span](image-url)
Figure 8

Wepman Auditory Sequential Memory
Chapter 5

SUMMARY AND DISCUSSION

Background

Thirty-six kindergarten children in the Temecula Union School District, Temecula, California, were evaluated with the Slingerland Pre-Reading Screening Procedures to determine possible interventional needs to prevent learning difficulties. One-third of those children obtained ratings of "Below M" on the screening device, identifying them as subjects for this study. The 12 subjects were evaluated with eight tests which had been chosen to measure purely aural/oral skills, uncontaminated by visual/graphic stimuli.

Research Summary and Implications

The purpose of this study was to determine whether each subject who had demonstrated difficulties with auditory/visual intersensory integration also experienced basic difficulties with the easier aural/oral intrasensory integration skills. The results of the study supported the alternative hypothesis which stated, "Children who failed the Slingerland auditory/visual integration tasks will fail at least one of the eight aural/oral subtests" selected by this investigator. The fact that eight of the 12 subjects failed at least one of the eight subtests implies that auditory processing difficulties appear concurrently with failing of the Slingerland Pre-Reading Screening Procedures. Test-by-test analysis of the results found four of the subtests
having most of the scores within the 'Average' range. This suggests that those tests, which included the three ITPA subtests and the G-F-W Sound Analysis Test, are not discriminative in identifying the particular type of aural/oral difficulties experienced by the subjects. On the remaining tests subjects produced scores which were below the mean for a normal population, implying that these subtests may be of value when attempting to isolate the auditory processing difficulties experienced by students with auditory/visual intersensory integration dysfunction.

**Discussion**

The findings of the present study ruled out the possibility that children who fail the Slingerland screening device have no difficulties at the basic aural/oral intrasensory integration level. The criteria set by this investigator for a subject to pass or fail the individual subtests made passing easy to accomplish, but a high percentage of failure occurred. This would tend to indicate that auditory processing difficulties are at least a factor in the results obtained for these students' performance.

Although the results supported the alternative hypothesis, the idea that the children's difficulties were at the simple aural/oral intramodal level was not sufficiently substantiated. The possibility that these children failed the Slingerland screening device due primarily to problems in the more complex auditory/visual intersensory integration area was not eliminated. Even though the subjects' scores were weaker than those of the normal population, they still passed the majority of the tests. Because these children showed some indication
of intrasensory auditory involvement, and they failed the auditory/visual/kinesthetic integrative Slingerland Pre-Reading Screening Procedures, the possibility must be considered that failure occurred somewhere between the simple aural/oral intrasensory skills and the more involved integration of the auditory, visual and motor modalities required by the Slingerland screening device.

Suggestions for Further Study

The purpose of this study was to find the possible cause of students' failure on the Slingerland Pre-Reading Screening Procedures. Because the Slingerland device actually involves the integration of three modalities--auditory, visual and motor--it may be necessary to look at the interaction of only two modalities at a time. Future studies could include:

1. Evaluating the auditory/visual intersensory integration skills of children failing the Slingerland screening, thus eliminating the motor response aspect.

2. Evaluating the visual/motor integrative skills of the above children to determine if the failure of the Slingerland screening could have been due to poor eye/hand coordination.

3. A content analysis of the procedures in the Slingerland device to determine the skills expected to pass the screening. This could reveal Slingerland's assumption that the teaching of skills tested is included in the curriculum for kindergarten students in the Temecula Union School District.
BIBLIOGRAPHY


Cohen, M. S., Personal interview. March (1982).


APPENDIX A

Table 2
### Table 2

**Summary of Subjects' Performance**

<table>
<thead>
<tr>
<th>Subject No.</th>
<th>Sex</th>
<th>Age</th>
<th>G-F-W Sound Mimicry Pass/Fail</th>
<th>G-F-W Sound Analysis Pass/Fail</th>
<th>G-F-W Sound Blending Pass/Fail</th>
<th>Wepman Auditory Memory Span Pass/Fail</th>
<th>Wepman Auditory Sequential Memory Pass/Fail</th>
<th>ITPA Auditory Reception Pass/Fail</th>
<th>ITPA Auditory Association Pass/Fail</th>
<th>ITPA Auditory Closure Pass/Fail</th>
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<td>F</td>
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| Total No.   | 10+ | 11+ | 6+ 6+ 5+ 7+ 2+ 10+ 0+ 12+ 0+ 12+ 1+ 11+ 17 | 79 |

1^Percentile  
2^Rating  
3^Scaled Score  
4^Fail  
5^Pass
APPENDIX B

CONSENT FORM
STUDYING CHILDREN'S
LISTENING/ANSWERING SKILLS

CONSENT FORM

I have been told that this study will involve children who attend kindergarten classes at the Vail Elementary School in the Temecula Union School District, and who are identified by the usual pre-reading screening tests as possibly needing early help for learning difficulties. The purpose of this study is to evaluate the children's ability to do various verbal tasks when given only spoken instructions.

I have been told that my child will be given the following tasks which together take 35 to 40 minutes, in two sessions, to perform for each child. There will be breaks between each task.

My child will be asked to:

1. Imitate sounds and syllables spoken by Miss Singleton.
2. Repeat back to Miss Singleton certain parts of words.
3. Repeat back, in correct order, a series of numbers.
4. Repeat back increasingly longer lists of words.
5. Answer "yes" or "no" to short questions of general information.
6. Say whole words after being given words with parts missing.
7. Give the last word of a statement.
8. Put together, into words, different sounds given from a recording.

I have been told that I will be informed of any changes in the nature of the study or in the procedures described above.

I have been told that a direct benefit to the children is a possibility of improved help for learning difficulties. Also, in allowing my child to participate in this study I will be helping to contribute to research and furthering the understanding of identification and habilitation of learning disabilities.

Page 1 of 2 pages
I have been told that there will be no risk to my child if he takes part in this study.

I have been told that the children's test results will be written on the test sheets, and that access to the results will be limited to only the speech/language specialist and the coordinator of special services for the Temecula Union School District. Any data derived from this study will not contain my child's name or identifying information.

My child's participation in this study is voluntary and I may withdraw my child from the study at any time unconditionally and without prejudice to my child's education.

I have read the contents of this consent form and have been given a copy of this form.

_____ I have read this consent form and hereby give permission for my child to join in this study.

_____ No, I do not give permission for my child to join in this study.

Signature of Parent or Guardian ___________________________ Date ___________________________

Signature of Witness ___________________________