

**DEVELOPMENT AND STUDY OF ARABIC
WORD INTELLIGIBILITY BY PICTURE
IDENTIFICATION (WIPI) IN NORMAL
HEARING EGYPTIAN CHILDREN**

THESIS

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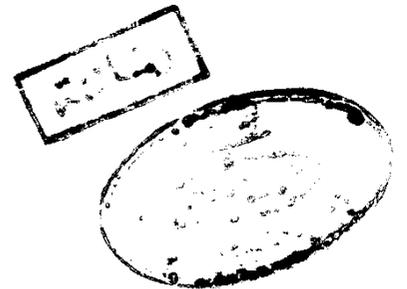
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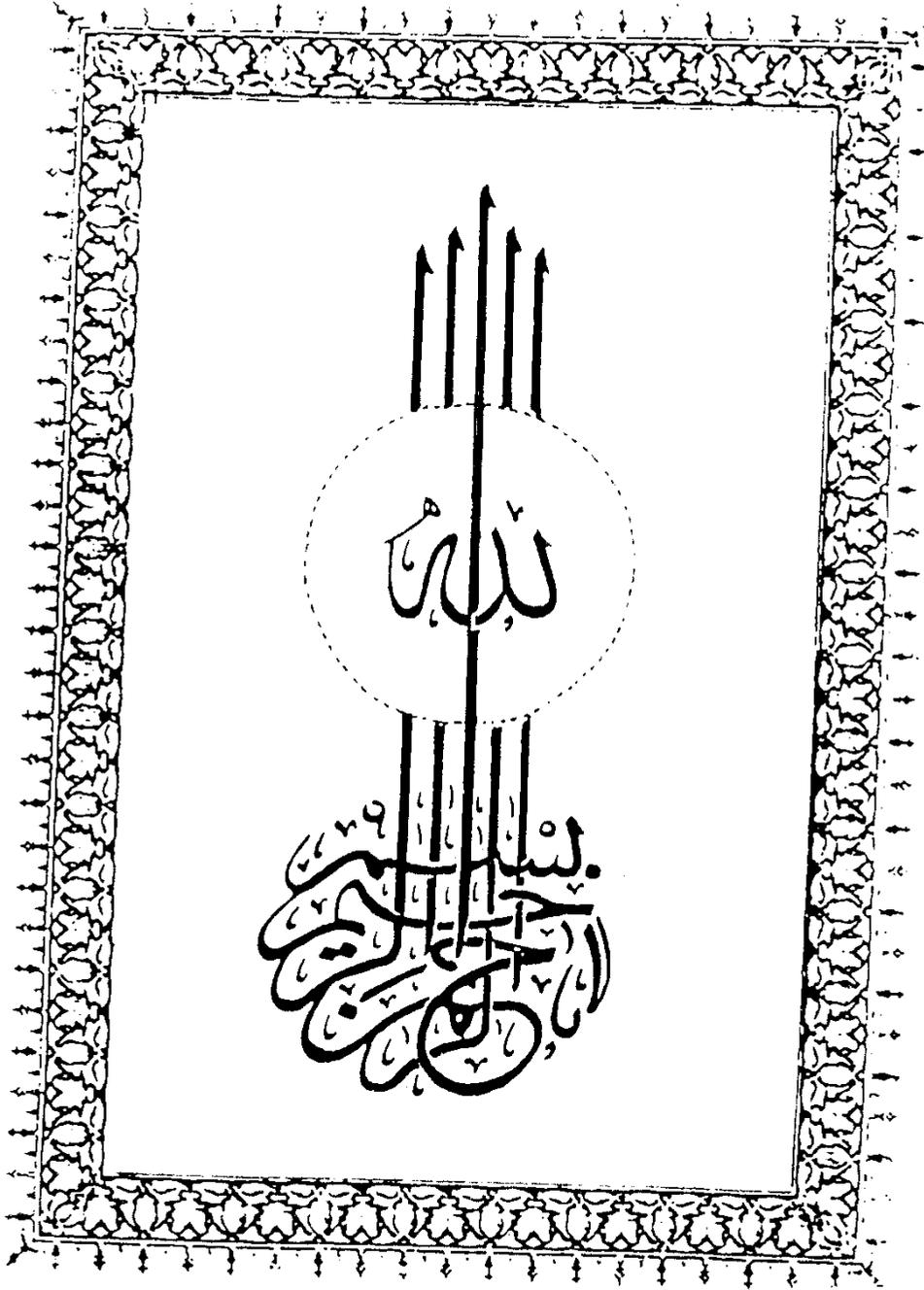
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INTRODUCTION AND RATIONALE

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The function of hearing is the building stone upon which our intricate human communication system was constructed.

The auditory-linked acquisition of language is unique to human beings, because it is a time-locked function. It is related to early maturational periods in the infant's life. Therefore, it is critical to attack hearing problems of children with all the skill, knowledge and insights of which we are capable.

Prevention and early identification of hearing loss protect the right of children to their essential humanity, which lies in optimal language function.

The handicap of a hearing loss may consist not only of a decrease in sensitivity to sound, but also of an impairment in understanding what is heard.

An integral part of the complete audiological battery for the assessment of hearing, includes evaluation of the subject's response to speech as a stimulus.

Pure-tones not only lack meaning, but also offer no explanation of what is occurring at suprathreshold levels. Since man does not operate in a world of threshold sounds, it is necessary to measure the ability to discriminate sounds at conversational levels, (Schwartz, 1971).

Speech discrimination tests were developed to assess the individual's ability to understand speech at conversational levels, (Penrod, 1985).

For children, speech discrimination tests were developed to study the possible relationship between disorders of speech, articulation and speech discrimination ability. These tests are also used for hearing aid evaluation, as well as for diagnosis of aural pathology, (Garstecki, 1980).

A variety of pediatric speech audiometric procedures have been developed, either by scaling down adult materials, or devising new materials uniquely suited to children's interest and abilities, (Jerger & Jerger 1982).

Haskins (1949) developed the Phonetically Balanced Kindergarten (PB-K) Word List for children. She applied this test as an open-set test, in which the subject may choose any response, limited only by his total vocabulary.

Smith and Hodgson (1970) studied the use of reinforcement in testing children's speech discrimination using PB-K. They concluded that reinforcement was important for maintaining attention and interest of the child during the test. This significantly improved discrimination scores.

Retarded language development and articulation problems which are common in children, may influence test results. However, written responses are not easy because of age limitations.

In order to overcome the limitations of open-set test for children, Jones and Studebaker (1974) recommended the use of closed-response test as an auditory speech discrimination test. That is a multiple alternative forced choice-test.

Picture-identification tests appeared to be potential methods that can successfully fulfil this requirement. The picture-pointing technique does not only offer valuable clinical information about the efficiency of the auditory system of normal children, but may also be used in assessing discrimination of the children who exhibit abnormal language acquisition.

One of the picture test is the Word Intelligibility by Picture Identification (WIPI), developed by Ross and Lerman (1970) to be used with hearing-impaired children. In this test, the child is asked to point to one of several pictures upon hearing a corresponding stimulus word.

Ross and Lerman(1970), concluded that this test appeared to be a potentially valuable clinical tool in pediatric audiology. Ross et al (1972) compared the administration of WIPI test under three input modalities: visual, auditory and combined auditory-visual in hearing-impaired children. Their results showed that the combined modality score was usually superior to either of the single modality scores.

Sanderson-Leepa and Rintelman (1976) compared speech discrimination performance of normal hearing children on the

WIPI test, as a closed-set test, versus two other open-set tests. They found that the WIPI test yielded the highest discrimination scores.

This test proved to be valuable in measuring speech intelligibility in hearing impaired American children. Several tests of different languages have been developed using the same principle.

There is no doubt that there is a need to develop such a test using Arabic words for use with Egyptian children, since the only Arabic test was developed by Ashoor and Prochazka (1985) using Saudi dialect.

This study was designed to develop the Arabic WIPI test material and to test its validity among normal-hearing Egyptian children.

REVIEW OF LITERATURE

REVIEW OF LITERATURE

It is estimated that the incidence of hearing loss in children is between 2 and 4 percent, (Satatloff, 1978).

The communicative abilities of a child are dependant largely on his hearing . The occurrence of hearing loss in infancy can be devastating. It interferes with the development of patterns of human interrelationship and modes of emotional expression. It often results in a speech deficit that further impairs the child's ability to communicate, (Satatloff, 1978).

Speech Audiometry:-

Pure-tone audiometry provides information regarding the hearing sensitivity and offers limited information concerning receptive auditory communication ability.

Indeed the ability to understand speech remains the most important measurable aspect of human auditory function, (Penrod, 1985). Therefore, speech audiometric tests were developed, using speech as a more meaningful signal that relates closely to the critical activities of life and everyday social communication, (Schill, 1985).

Speech material has become widely used, not only for measurement of hearing, but also to assess suprathreshold intelligibility. It is also used to measure progress in auditory training, to evaluate hearing aid performance, to predict the success of otologic surgery, and to aid in the diagnosis of both peripheral and central auditory disorders.

Speech Audiometric Tests:-

The two main conventional speech audiometric tests are speech reception threshold (SRT) and speech discrimination.

Speech reception threshold (SRT) is defined as the intensity level at which a listener can repeat 50 percent of the speech material presented. Most commonly the speech material used in measuring SRT is the spondee words.

Speech reception tests do not offer enough information about how well the subject is functioning at suprathreshold level, that is why speech discrimination tests are considered more informative, (Schwartz, 1971).

Speech discrimination is defined as a suprathreshold speech test that estimates the subject's ability to understand speech.

Speech discrimination tests were also developed to examine the subject's ability to discriminate among similar sounds or among words that contain similar sounds.

Different types of materials are used in speech discrimination tests. These may be sentences, spondee words, monosyllabic words and nonsense syllables.

The easiest is the natural sentence and the most difficult are the nonsense syllables.

Many different terms have been used to describe speech discrimination ability including articulation,

intelligibility, understanding, perception and recognition, (Penrod, 1985).

Speech Audiometric Tests For Children:-

A variety of pediatric speech audiometric procedures have been developed, either by scaling down adult materials, or devising new materials uniquely suited to children's interest and abilities, (Jerger and Jerger, 1982).

The development of pediatric speech intelligibility test materials has encountered major problems. A primary difficulty has been to obtain test materials that are not influenced by normal developmental differences in receptive language skills in children, (Jerger and Jerger, 1983).

Schwartz and Goldman (1974) stated that some of the inconsistent and contradictory findings regarding speech-sound discrimination performance in young children may be attributed to variables in the construction and administration of tests assessing this skill. These variables include the type of material selected as stimulus items, as well as the context in which the stimulus items are presented. It also includes the type of response required, the presence of background noise, and the inclusion of a training session to familiarize the listener with either the task involved or the meanings of the stimulus items. The majority of research describing variables influencing speech-

sound discrimination has focused on the type of materials chosen as stimulus items.

Speech discrimination is a lengthy procedure. Children may become easily fatigued, or may lose interest when the task becomes too difficult. Moreover, the short attention span of children has always been a major problem. The use of reinforcement is important for maintaining the child's attentions and interest during testing.

Reinforcement was proved to improve significantly discrimination scores. (Smith and Hodgson, 1970).

Generally, pediatric speech material falls into one of two categories: open-set and closed-set tests.

In open-set test, the subject is asked to respond by repeating the word he hears. The subject may choose any response, limited only by his total vocabulary.

Open-set tests may serve as a useful predictor of a person's ability to perceive the acoustic properties of speech signals, (Garstecki, 1980).

The closed-set test is a multiple, alternative, forced choice test. In this test, the subject is asked to choose one response of a limited number. The response may be written words or pictures.

Haskins (1949) developed one of the first speech tests for children. Similar to adult's discrimination tests, this