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Preventative Program to Early Diagnosis and Remediation of Dyslexic Pupils in Primary School in Egypt

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Zusammenfassung

Phonologisches Bewusstsein ist von entscheidender Bedeutung für die Entwicklung der Alphabetisierung. Zahlreiche Studien zeigen, dass Kinder mit niedrigem phonologischen Bewusstsein eher Schwierigkeiten beim Lesenlernen aufweisen als jene mit einem hohen Niveau.

Das Ziel der vorliegenden Studie war die Entwicklung eines Programms zur frühzeitigen Erkennung von Problemen im Bereich des phonologischen Bewusstseins und der Phonem-Graphem-Korrespondenz. Die Studie besteht aus zwei Teilen: im ersten Teil wird ein Instrument zur Frühdiagnose von phonologischen Bewusstseins und Phonem Graphem Korrespondenz entwickelt und erprobt. Dazu wurden 85 bzw. 80 ägyptische Kinder der ersten Klasse zu 2 Zeitpunkten mit dem Instrument getestet und die Ergebnisse für die Normierung und Validierung des Instruments genutzt. Die Ergebnisse deuten darauf hin, dass dieser Frühdiagnose-Test zuverlässig und valide das phonologische Bewusstsein, und die Phonem Graphem-Korrespondenz von ägyptischen Kindern in der ersten Klasse Kinder zu beurteilen vermag.

Im zweiten Teil wird ein entsprechendes Förderprogramm entwickelt und vorgeschlagen. Dazu wurden die Befunde aus der Erprobung des Tests herangezogen, die Aufschluss über die unterschiedliche Schwierigkeit verschiedener Aufgaben (Reimen, Silbensegmentierung, unterschiedliche Laute und Lautpositionen im Wort bei der Graphem Zuordnungen) gab. In der Regel besteht eine enge Beziehung zwischen phonologischem Bewusstsein und Phonem-Graphem-Zuordnung. Diese Ergebnisse konnten genutzt werden, um die Entwicklung eines Förderprogramms zu unterstützen, das hiermit ebenfalls vorgelegt wird, aber noch der praktischen Erprobung bedarf.

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Introduction

1. Introduction

The importance of learning how to read and write is recognized by almost every country in the world. This fact is reflected by the adoption of the United Nations' resolutions 45/199 and 50/143 which state that 'literacy is considered a basic human right and so reflects the central role of reading and writing in all societies' *(Elbeheri; et al- (2006)*

Reading is seen as the basic skill for the needs of a community. Students in various stages of learning consider the ability to read and write as critical element for the participation in society. These skills provide individuals with a tool for communication, critical thinking, and attainment of social and cultural power. The ability to read and write facilitates a successful participation in a variety of environments such as home, work, school, and social settings. Besides that "it is the main gate of each knowledge" فتحى على يونس *2002*) (5), It helps the individual to reach academic excellence, and good achievements in other subjects, whereas a weaknesses in this ability is an obstacle to good achievements. (*(4)* عبد المنعم عبد الصمد, *1997*) *(13)*مصطفى رسلان , *1999*) *Power (2006)*

If reading has this importance it is, in general, more important for primary school pupils. Especially in the first school years the ability to read is considered one of the most important goals. *(Tolvanen, et al, 2007*). Accordingly, children who do not learn how to read efficiently in the first three years of school will find it difficult when subsequently asked to read. Therefore, schools should make a greater effort to teach children how to read in this early period; so that they can understand written language or

interpret the written symbols of the oral language, which they know and use in their everyday lives . ((5) فتحى على يونس, 2002)

Reading skills, just like language skills, develop successively, because it is assumed that the growth of skills is a gradual one since the beginning of formal learning in the first elementary grade. The task of learning to read is not natural, simple or automatic. Reading involves the simultaneous cognitive processes of linking the abstractions of phonemes (sounds) to graphemes (letters) and then to morphemes (words). The ultimate goal of these processes is to arrive at comprehension (meaning). Since phonemes convey no meaning, these abstractions remain unclear for many first grade students striving for literacy. Therefore "there is a category of students who are unable to keep pace with their colleagues in reading, or they realize a level of achievement commensurate with being intelligent, or with their peers IQ, and age. Although these children are not suffering from mental disorders, or are culturally disadvantaged and had any physical problems". *((3) السيد عبد الحميد سليمان, 2000)* These children are the ones who come to be nominated as dyslexic.

Developmental dyslexia is one of many reading difficulties. It has deceived linguists, neurologists, psychologists and educators over the last century and it has recently received 'much more attention than at any other time in the past.

In an attempt to identify the causes of dyslexia, and in searching for the best ways to treat it, educational research in reading has, in recent years, tended to give more weight to hypotheses that centered on potential reasons of reading problems in general and dyslexia in particular. This led to a change of focus. First the main focus was put on environmental and social factors, and then it shifted to the study of the cognitive processes used

by the student during reading, which could reveal some of the causes of dyslexia. (*1) أحمد زينهم أبو حجاج, 2001*)

The acquisition of reading-related skills requires the coordination of linguistic and cognitive areas which are involved in auditory, visual, cerebral and phonological processes. Thus dyslexia can result from defects in any of the above processes.

Although there are a number of theories on dyslexia which provide an explanation for the cause of reading difficulties, the most powerful of these hypotheses is the Phonological hypothesis. It explains dyslexics' reading impairment by referring to the fact that learning to read an alphabetic system requires learning the grapheme-phoneme correspondence, i.e. the correspondence between letters and sounds of speech. If these sounds are poorly represented, stored or retrieved, the learning of grapheme phoneme correspondences, the foundation of reading for alphabetic systems, will be affected accordingly *(Saviour and Ramachandra: 2006*) In support of this proposal *Pammer, Trichur, Vidyasagar (2005)* indicate that one of the strongest and most enduring themes in dyslexia research is, that dyslexic children consistently demonstrate problems in the coding, manipulation and comprehension of the sounds of spoken words. Whereas *(Kirby, et al, 2003)* indicate that phonological awareness is a key component in the development of the reading ability, and that poor phonological awareness is an important core deficit in the reading disability *(Harm, and Seidenberg 1999)* state that phonological awareness plays a causal role in reading acquisition. It enables, or at least assists, the acquisition of early reading skills.

Phonological awareness is considered one of the most important factors explaining and affecting dyslexia because it is a necessary precursor of reading. Children who show high levels of phonological awareness are

more likely to become good readers and conversely children, who lack phonological awareness, are more likely to become poor readers. Though "it may be developed through spontaneous experiences with language and alphabetic system, it has been found that some children entering school without the ability to analyze the sound structure of words, are at risk for having difficulties with reading". *Wanzek, Bursuck, Dickson (2003)*

Given the importance of reading, especially in the first months of the first grade, researchers and practitioners in education have become increasingly concerned with constructing and developing preventive programs. These programs can predict, and discover the difficulties that can occur when children learn to read as early as possible, In addition these researchers and practitioners are developing remedial education programs in support of reading learning. *(Mannhaupt , 2006) (Chafouleas, et al 2002)*

Despite the importance of such programs for the early diagnosis and treatment of dyslexia, to reduce the steady increase in the rates of dyslexic, this trend hasn't received attention in educational research in Egypt. To the researcher's limited knowledge, there is still no prevention program for early diagnosis and treatment of dyslexia. The intervention programs which are often used in Egypt were originally designed for non-Arab environments (*7). 2002 : فريدة راشد الزياتى).*

There has been a steady increase in the number of Egyptian dyslexic children. *Alzayyat (2000)* (6) indicates that the proportion of children with learning disabilities, according to the educational literature, is between 10: and 15% of all school children. The percentage of those who have dyslexia lies between: 85: and 90% of the children with learning difficulties. There exists a deficiency in the provision of preventive programs that help to

provide an early diagnosis and treatment of these cases and therefore there is a request from the most basic levels of education for helping pupils who suffer from dyslexia (عبد الطيف عبد القادر على ، 2002)12) (سامية على البسيونى (9) 2002 (10)19994 هنداوى عبد المجيد صبرى/) studies monitoring the manifestations of dyslexia found the difficulty in:

- pronunciation of new words
- discrimination similarities, differences between words
- distinguishing between the sounds of letters
- poor treatment of audio and visual memory (*Harrie, Rogrerp, Carol, 1984, 1:3)*
- reading the words
- Distinguishing between symbols, and reading it in the wrong direction.
- Recognizing sounds and words.
- Interpreting the information provided to student in printed form.
- Blending and segmenting the sounds of the letters in words. *(فتحى مصطفى الزيات, 2000) (6)*

At the community level, the complaints about the reading difficulties (dyslexia) are raised and could lead to negative effects “such as the loss of the student’s self confidence, tension, shame, and the loss of motivation and attention which are needed to accomplish the tasks of study. On the other hand, a poor academic achievement and a poor ability to learn make the child more vulnerable to delinquency in the behavior (14) (نصرة جلجل، 2003) (السيد عبد الحميد سليمان (3 2000,) . This prompted some specialists to call for the establishment of so-called literacy clinics. (فتحى على يونس (5), أحمد زينهم أبو حجاج، 2002) Obo Haggag´s study suggested developing training programs on phonological awareness, which can provide the reading preparedness level in the first months of the first grade. *(أحمد زينهم أبو حجاج، 2001 (1) 2002) (2)(*

Based on the above-mentioned the problem of the current study is basically focused on the presence of children at risk for dyslexia. More specifically it deals with phonological awareness, phoneme grapheme correspondence in Egypt, and the need for developing preventive programs for the early identification and treatment of phonological awareness and phoneme grapheme correspondence in the first grade. Such programs have not yet been developed by any of the previous studies, because so far this has not been within the limits of the researchers.

In an attempt to overcome these problems, the current study will proceed as follows:

- First chapter: introduction which includes the statement about the general problem of the study.
- Second chapter: review of literature which includes the: definition, theories, prevalence of dyslexia, specifically Arabic dyslexia, in order to determine which dyslexia theory will be adopted by the study, and to identify the aspects of the Arabic language to take into account when designing the preventative program.
- Third chapter: review of literature with special emphasis on Phonological Awareness: definition, importance, development, assessment, instruction, in order to arrive at methods that can be used to design the preventative program compatible with the nature of teaching the Arabic language.
- Fourth chapter: methodology, including two types of preventative program (diagnostic and intervention). The diagnostic instrument includes: design, development, and implementation of the test. The intervention instrument includes: design an intervention program including: program objectives, foundations, content, teaching strategy, materials, and evaluation.

  Fifth chapter: Test Characteristics, including frequencies, item characteristics, reliability, validity

- Sixth chapter: results and discussion: including the results of diagnostic test implementation (answering the research questions), and discussion concentrate on how the results of diagnostic test used to develop an intervention program.

2. Relevance of the study:

This study is expected to contribute to help the following target groups:

- To the first grade teachers by providing them with a diagnostic testing and treatment program.
- To the First-grade children by identifying those children who are expected to be at risk, and to provide treatment for them.
- To the first-grade children's´ parents by providing them with instruments which enable them to find out whether their children are expected to be at risk for reading problems. Furthermore parents benefit from the treatment program to support their children's´ skills.

3. Limitations

This study is constrained by the following limitations:

- The intervention program was designed without try-out in schools, because this was require the researcher's presence in Egypt for at least four months. Due to the time constraints, this has not been possible for the researcher at the beginning of the school year.
- The study is limited to diagnosis and treatment of phonological awareness and phoneme grapheme correspondence. Because of the close relationship between these skills and the reading development, necessary other skills like the long- and short-term memories that affect early reading learning do not fall within the scope of the study.

- The study concentrates on first-grade children in the first semester of the first school year only, because the idea of the preventive program is based on the early identification of children who might be at risk. The treatment program should provide the necessary support for the children even before the problems fully develop.

Dyslexia: definition, theories, prevalence and Arabic dyslexia

This chapter aims at defining the term "dyslexia" and at giving a detailed description of its theories in order to determine which definition and theory is adapted when assessing and treating dyslexia. The prevalence of it and the nature of Arabic dyslexia are useful when constructing the diagnostic and remedial programs. Therefore this chapter contains the following elements:

- The definition of dyslexia.
- The theories of dyslexia.
- The prevalence.
- The nature of the Arabic Language and dyslexia.

1. The definition of dyslexia

Scientific research is in general based on a definition of terms. In the field of dyslexia, a specific and precise definition is required for several reasons. It helps us to:

- Determine the causes and consequences of it.
- Identify the different species it can contain.
- Identify the best methods, strategies and programs to prevent or treat it.

Despite this significant role the definition should play in the scientific and clinical understanding of dyslexia, there are numerous vague, ambiguous, and invalid descriptions of dyslexia, *Kalman; and Hettlman(2003)* .Depending on the author, the definitions vary with regard to the focus (wide vs. narrow), as well as the symptoms and the possible reasons for it.

As an example for a definition, that expands the term of dyslexia, the *international Dyslexia Association (1998*) defines it as follows:

"Dyslexia is a learning disability characterized by the problems in expressive or receptive, oral or writing language. Problems may emerge in reading, spelling, and writing, speaking, or listening. Dyslexia is not a disease, it has no cure. Dyslexia describes a different kind of mind, often gifted and productive, that learns differently. Dyslexia is not a result of low intelligence. Intelligence is not the problem. An unexpected gap exists between learning aptitude and achievement in school. The problem is not behavioral, psychological, motivational, or social. It is not a problem of vision. People of dyslexia don't see backyarders'. Dyslexia results from differences in the structure and function of the brain. People with dyslexia are unique, each having individual strengths and weaknesses. Many dyslexics are creative and have unusual talents in areas such as arts, athletic, architecture …. . Dyslexic often shows special talent in areas that require visual, spatial, and motor integration. Their problems in language processing distinguish them as a group. This means that the dyslexic has problems translating language into thought (as in listening or reading) or thought into language (as in writing or speaking)" Ott (2007).

Whereas *The British Dyslexia Association (BDA)* defines it as seen below:

"*Dyslexia is best described as a combination of abilities and difficulties which affect the learning process in one or more of reading, spelling, and writing. Accompanying weakness may be identified in areas of speed processing, short term memory, sequencing, auditory or visual perception, spoken language and motor skills. It is particularly related to mastering and using writing language, which may include alphabetic, numeric notation. Some children have outstanding creative skills; others have strong oral skills. Dyslexia occurs despite normal teaching, and is independent of*

socio-economic background or intelligence. It is however, more easily detected in those with average or above average intelligence". *Ott(2007*

It can be seen from the two previous definitions, that the scope of dyslexia has been extended in order to include the following:

- With regard to the symptoms "reading, spelling, writing, speaking, or listening "are mentioned in the first definition, and "reading, spelling, and writing" in the second one.

- In the sample not only children with average or above average intelligence are included, but also children who are gifted. It says: "many dyslexics are creative and have unusual talents" in the first definition, and "children who have outstanding creative skills" in the second one.

Focusing on a narrow sense of dyslexia, *the Working Party of the Division of Educational and Children Psychology of the British Psychology Society* proposes the following definition of dyslexia:

"*Dyslexia is evident when accurate and fluent word reading and/or spelling develops very incompletely or with great difficulty*". *Peer and Reid (2002), Farrell (2006), Squires and Mckeown (2006)* and the *Orton Dyslexia Society Research Committee* (1992) define it as:

"*Dyslexia is one of several distinct learning disabilities. It is a specific language-based disorder of constitutional origin characterized by difficulties in single word decoding usually reflecting insufficient phonological processing abilities. These difficulties in single word decoding are often unexpected in relation to age and other cognitive and academic abilities; they are not the result of generalized developmental disability or sensory impairment. Dyslexia is manifested by a variable difficulty with different forms of language, often including, in addition to problems reading, a conspicuous problem with acquiring proficiency in writing and spelling "Lyon, 1996).*

In these two definitions the symptoms of dyslexia only include the reading and spelling problems. They are referred to as the "accurate and fluent of the word reading and/or spelling" in the first one, and the "single word decoding" in the second one.

The current study adopts the following definition of dyslexia, which has been introduced by *Lyon; Shaywitz* (2003)

"*Dyslexia is a specific learning disability that is neurobiological in origin. It is characterized by difficulties with accurate and/or fluent word recognition and poor spelling and decoding abilities. These difficulties typically result from a deficit in the phonological component of language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction. Secondary consequences may include problems in reading comprehension and reduced reading experience that can impede growth of vocabulary background knowledge*".

This definition will be used for the following reasons:

- The definition differentiates between the broad term "learning disability" and the narrow term "dyslexia". Because the general (LD) category encompasses a wide range of disorders in listening, speaking, reading, writing, and mathematics, the definition recommends discontinuing the use of the broad term LD when discussing reading disabilities. Instead specific disabilities, defined in terms of coherent and operational domains, should be discussed.
- The definition determines the origin of dyslexia as a neurobiological one. A wide range of neurobiological investigations were done in which post-mortem brain specimens and diffusion tensor MRI imaging were used. Based on these investigations the hypothesis, which states that there are

differences in the brain regions between dyslexia and non impaired readers, is supported.

- The definition specifically refers to the difficulties of accurate word recognition (identifying real words) and of the decoding abilities (pronouncing pseudo-words). It also recognizes poor spelling and fluency as characteristics of dyslexia.

- The definition attributes the cause of dyslexia to a deficit in the phonological component of language. There exists a strong consensus among investigators in the field, that the central difficulty in dyslexia reflects a deficit within the language system. In order to read, a child has to develop the insight, that spoken words can be pulled apart into phonemes, and that the letters in a written word represent these sounds. As numerous studies have shown such awareness is largely missing in dyslexic children and adults.

- The definition considers dyslexia as an unexpected difficulty in relation to other cognitive abilities and to the provision of effective classroom instruction, which should be assessed via comparisons of reading age with chronological age and/ or by comparing the reading ability to educational level and professional level of attainment.

- The definition provides a causal model that can help guiding comprehensive assessment efforts, for example the assessment of phonological awareness, alphabetic principle, accuracy, fluency, and vocabulary. By setting the focus on understanding how phonological difficulties lead to problems in accuracy and fluency, one can observe that these difficulties might be followed by problems regarding the vocabulary and the background knowledge. Together these problems may have an impact on reading and understanding connected text *Lyon, et al,* (2003) , *Shaywitz; et al,(2008)*

2. The theories of dyslexia

There are a number of theories of dyslexia that try to explain the cause for reading difficulties and that search for the best assessment and instruction to it. These theories can be summarized as the following.

2. 1. The rapid auditory processing theory

Given that some perceptual aspects of speech are relevant to developing phonemic awareness, it has been proposed that the reading ability may be related to the speech perception. If that is the case, the deficit lies in the perception of short or rapidly varying sounds.

Support for this theory arises from evidence that dyslexics show poor performance on a number of auditory tasks, including frequency discrimination, temporal order judgment, and also abnormal neurophysiological responses to various auditory stimuli have been demonstrated.

The identification of auditory processing difficulties is likely to involve identifying the following:

- Difficulties with auditory discrimination.
- Inability to perceive consonant sounds in different positions (initial, medial, final).
- Difficulties with auditory sequencing.
- Difficulties with auditory blending.
- Difficulties with auditory segmenting. *Farrell(2006) , Ramus; et al (2003)*

2. 2. The visual theory

The visual theory addresses difficulties with the processing of letters and words on a page of text, which may contribute to reading problems. There are several visual factors associated with dyslexia and related to convergence, accommodation and tracking. Convergence involves the eyes converging in the letter of print or handwriting at a distance of about 30 centimeters to insure that the brain receives a unified picture of the letters and words. For some children with dyslexia, it has been suggested that there may be difficulties concerning the vision converging, which can lead to binocular instability. Accommodation relates to the skill of being able to quickly adjust the focus of the eyes to the changing of circumstances. This can for example be the changing distance between a print and the eye as the eye moves down a page of written text.

Tracking concerns the skill of scanning a line of print word by word and line by line while keeping one s place. *Ramus; et al (2003), Ramus (2005) Farrell (2006)*

The assessment of visual difficulties is likely to involve age-inappropriate difficulties as discriminating between letters that appear to be the same (“m” and “n”) or that are the same but have different forms(“M” and “m”). The pupil also omits or transposes part of a word (which could indicate a difficulty with visual segmentation). *Farrell (2006), Squires and Mckeown (2006)*

2. 3. The cerebellar theory

The Cerebellar Deficit Hypothesis posits abnormalities in the cerebellum[1] as an underlying causal factor of dyslexia. Here the biological claim is that the dyslexic's cerebellum is mildly dysfunctional and that a number of cognitive difficulties ensue.

Firstly, the cerebellum plays a role in motor control and therefore in speech articulation. It is postulated that retarded or dysfunctional articulation would lead to deficient phonological representations. Secondly, the cerebellum plays a role in the autoimmunization of over learned tasks, such as driving, typing and reading. A weak capacity to automatize would affect, among other things, the learning of grapheme–phoneme correspondences.

Support for the cerebellar theory derives from evidence of the poor performance of dyslexics in a large number of motor tasks. Brain imaging studies have also shown anatomical, metabolic and activation differences in the cerebellum of dyslexics, and a poor dyslexic performance in coordination. The normal pattern of cerebellar asymmetry is anomalous in dyslexia. *Ramus; et al (*2003, *Saviour; and Ramachandr (2006), Nicolson; et al (2001)*

2. 4. The general sensorimotor syndrome or magnocellular theory

The magnocellular[2] theory attempts to integrate all the findings about dyslexia, based on the postulates that the magnocellular dysfunction is not re-

[1] The cerebellum (Latin for *little brain*) is a region of the brain that plays an important role in the integration of sensory perception.

[2] Magnocellular are cells in the brain responsible for resolving motion and coarse outlines.

stricted to the visual pathways but is generalized to all modalities (visual and auditory as well as tactile). Furthermore, as the cerebellum receives massive input from various magnocellular systems in the brain, it is also predicted to be affected by the general magnocellular defect. This theory therefore manages to account for all known manifestations of dyslexia: visual, auditory, tactile, and motor and, consequently, phonological. Evidence specifically relevant to the magnocellular theory includes magnocellular abnormalities in the medial as well as the lateral geniculate nucleus (auditory nerves) of dyslexics' brains. *Frith (1999*) *Ramus; et al (*2003), *Bishop (2002), Saviour; and. Ramachandra(2006)*

2. 5. The Phonological Deficit theory

The Phonological Deficit Hypothesis (PDH) asserts that the underlying cause of reading problems in dyslexia is some abnormality in phonological processing (see: *Alm (2004)*, this means that the phonological theory mainly postulates that dyslexics have a specific impairment in the representation, storage and/or retrieval of speech sounds. It explains dyslexics' reading impairment by the fact that learning to read an alphabetic system requires learning the grapheme–phoneme correspondence, i.e. the correspondence between letters and sounds of speech. If these sounds are poorly represented, stored or retrieved, the learning of grapheme–phoneme correspondences, which is the foundation of reading alphabetic systems, will be affected accordingly (*Ramus; et al (2003): Farrell (2006)*

The phonological deficit symptoms vary. Children for example might have problems in phonological awareness and in repeating polysyllabic words. They might be less sensitive to alliteration and rhyme than peers and they also have difficulties with sound segmentation and word blending, both of

which are critical for the development of reading and spelling. Also they have difficulties with rapidly naming objects, and do poor on short term memory tasks. *Squires and Mckeown(2006), Alm (2004) Démonet; et al (2004)*

Support for the phonological theory comes from evidence that dyslexic individuals perform particularly poor on tasks requiring phonological awareness, i.e. conscious segmentation and manipulation of speech sounds. However, evidence for poor verbal short-term memory and slow automatic naming in dyslexics also points to a more basic phonological deficit, which might have to do with the quality of phonological representations, or their access and retrieval. Anatomical work and functional brain imaging studies also support the notion of a left perisylvian dysfunction as a basis for the phonological deficit. (*Ramus; et al (2003), Ramus(2005) Frith(1999)*

The current study will be based on the phonological deficit hypothesis in its assessment and treatment process for the following reasons:

- Researchers support the hypothesis because developmental dyslexia seems best characterized as a specific phonological deficit. *Ramus (2003, Hulme; et al (2005) Puolakanaho; et al (2007)* despite different languages. In this context *Goswami (2002) (2003)* indicates that "dyslexic children across all languages, so far studied, show impairments in tasks that rely on the efficient functioning of the phonological system. Classically, they display deficits in three core areas: phonological awareness, phonological memory, and rapid production of familiar phonological labels in response to symbols", and using traditional, modern or behavioral measures. *Desroches; et al (2006)*: concludes that the use of eye tracking shows the significant underlying nature of phonological deficits in dyslexia. Whereas *Georgiewaa; et al (2002)* show that the behavioral data, solving the pho-

nological decoding tasks (word/non-word reading and letter transformation), were more problematic for the dyslexics (i.e. slower encoding, thereby requiring greater effort).

- The phonological deficit hypothesis can explain the development of dyslexia because the phonological deficit could be seen as "secondary to a more basic auditory impairment, and as part of a general sensorimotor deficit theory" *Ramus:2003* It could also be viewed as a consequence of the cerebellum dysfunctional theory *Ramus; et al (*2003, *Saviour; and Ramachandra(2006), Nicolson; et al (2001)*
- Additionally, this hypothesis is measurable and can be taught in the classroom situation, and it offers indications to how to assess and treat dyslexia in a classroom.

All of this supports the adoption of the phonological deficit hypothesis for the current study.

3. Prevalence of dyslexia

The proportion of dyslexic individuals in a population at any time is properly called the 'prevalence rate' *(Rice and Brooks, 2004).* There are some problems in determining the prevalence of specific developmental dyslexia: firstly there are links between figures for the prevalence of dyslexia and its definition: no prevalence figure is meaningful unless there is a specification of the criteria used for determining its presence or absence. Prevalence estimates for dyslexia are susceptible to errors because any estimate will reflect the chosen definition and its operationalisation. Not two of those definitions could possibly identify the same individuals, or the same number of individuals in any population. Secondly, there are problems arising from the fact that dyslexia may manifest itself differently in

different languages. Different languages of the world have different writing systems. There are for example some languages - Spanish, Italian and Welsh, for instance – in which the same alphabetic letter consistently represents the same sound, while in other languages it does not, e.g., English and French. This may result in a different manifestation of dyslexia based on the changing of language characteristics. In addition we do not know whether biological anomalies which occur in dyslexics are common to all countries of the world, or whether the distribution of these anomalies varies from one country to another. The third central problem is that of finding the resources in order to carry out dyslexia assessments on a large scale. In assessing for dyslexia most psychologists use a wide range of tests, which take two or more hours, including tests of different cognitive functions. Finally there remains an even more intractable difficulty with these figures arising from the existence of dyslexia variance. There are, after all, many ways in which persons may manifest that they are dyslexic. The list of such ways is open-ended. *(Miles: 2008, Rice and Brooks, 2004)*

When taking these problems into account, the stated prevalence of dyslexia differs. The International Book of Dyslexia gives numbers from 14 different countries around the world and the range of the stated incidence extends from 1% to 11%. According to the American Psychiatric Association (1994) the prevalence of Reading Disorder (dyslexia) in the United States is estimated at 4% of school-age children. The British Dyslexia Association estimates the prevalence to 4% (BDA, 1998). In Sweden the prevalence is estimated to 5-10%. (*Alm (2004),* whereas *Eden and Moats´(2002)* estimation of the prevalence currently lies at 5-10% for the US and the U.K. The *Parliamentary office of science and technology* (2004) gives a varying prevalence rate between 2% and 15% of the population, and finally *An Inserm collective expert report(2007)* suggests a prevalence rate of dyslexia close to 5% of all French primary school children.

In summary it could be said that in the literature, the prevalence of dyslexia spreads over a wide range, between 5% as a minimum and a maximum of 15%. This is possibly due to the differences in the dyslexia manifestation in different languages and additionally to the extension or narrowing of the criteria used for determining the presence or absence of dyslexia.

4. The nature of the Arabic Language and dyslexia

Very few studies have investigated dyslexia in native readers of Arabic. In addition to the problems common to dyslexia, some specific problems related to Arabic have been observed and reported. These concern the Arabic phonology system (sounds and syllables systems), the Arabic orthographic system, and in addition two phenomena with significant impact on Arabic literacy learning: *diglossia* [3]and transparent[4]. In addition there are the challenges associated with the assessment of dyslexia in Arabic.

4.1. Arabic phonetics system

The Arabic phonetic system, like in other languages, consists of sounds and syllables. The sound system is divided into consonants and vowels

4. 1. 1. Arabic consonants

Classical Arabic consonants contain 28 single (table 1) and 28 geminate counterparts

[3] *Diglossia* describe a situation where two varieties of the same language are used for socially distinct functions

[4] Transparent here refers to the association between written symbols and language sounds

Table (1)

Arabic orthography (AO) and its representation in the International Phonetic Alphabet (IPA) as the consonant inventory of Modern Standard Arabic.

AO	IPA	AO	IPA	AO	IPA	AO	IPA
ب	b	ذ	ð	ط	$t^{ʕ}$	ل	l
ت	t	ر	r	ظ	$ð^{ʕ}$	م	m
ث	θ	ز	z	ع	ʕ	ن	n
ج	ʒ	س	s	غ	ʁ	هـ	h
ح	ħ	ش	ʃ	ف	f	و	w
خ	χ	ص	$s^{ʕ}$	ق	q	ي	j
د	d	ض	$d^{ʕ}$	ك	k	ء	ʔ

(Alghamdi, Muzafar . 2008)

The types of consonants and the places of articulation are various, which may be represented in the next table

Table (2)

The Arabic consonant inventory

	Bilabial	Labiodental	Dental	Alveolar	Postalveolar	Palatal	Velar	Uvular	Pharyngeal	Glottal
Plosive	b			t d t̲ d̲			k	q		ʔ
Nasal	m			n						
Trill				r						
Tap or Flap				ɾ						
Fricative		f	θ ð ð̲	s z s̲		ʃ		χ ʁ	ħ ʕ	h
Affricate					ʤ					
Glides (Approximant)	w					j				
Liquid (Lateral Approximant)				l						

/t̲/, /d̲/, /s̲/, and /ð̲/ reflect emphatic consonants. According to IPA guidelines, these emphatic consonants may be transcribed as /$t^{ʕ}$/, /$d^{ʕ}$/, /$s^{ʕ}$/, /$ð^{ʕ}$/.

/t/, /d/, /s/, and /ð/ reflect emphatic consonants. According to the IPA guidelines, these emphatic consonants are transcribed as /t/, /d/, /s/, /ð/.(Newman , 2008)

The phonological development depends on the child´s acquisition of his/her language's native phonemic inventory. In this context (*AlBouni. 2008 (Tomokiyo, et al (2008)* indicate that some Arabic sounds are more difficult to perceive and produce by children than others. While stops, nasals and glides are easier to perceive and to produce, emphatic or pharyngealized sounds "which one may think of them as complex sounds in the sense that they involve more than one point of articulation" are more difficult to perceive and to produce by children. *(Selouani; and Caelen, 2008)*

4. 1. 2. Arabic vowels

All words in Arabic are based on phonological patterns built on roots that are consonantal patterns. The phonological pattern is constructed of short vowels built onto roots. The phonological process does not break the orthographic order of the consonantal root. In other words, short vowels are not regarded as independent graphemes in written Arabic, but are represented as extra diacritical markings, while patterns that include vowel letters are inserted between the root consonants *(Taha, 2006)*

There are six vowels in Arabic: three short and three long ones. The short vowels´ signs are posted above, and/or in, and/or below the letters for letter-sound pronunciation: (a), *a, fatha,* is indicated by a small stroke above the consonant, as بَ *ba*; (b) *i, kasra* , is a similar stroke below the letter, as بِ *bi*; (c) *u, damma* , is written like a miniature /*waw*/ above the letter, as بُ *bu*. In order to indicate the absence of a vowel, a *sukon* is written above

the letter, as بْ *eb*. Usually these are considered short vowels, and they are lengthened by the addition of long vowels which are considered a part of the alphabet: ا / *a*/ و / *waw*/ ى / *ya*/. *(Abu-Rabia, 1998)*

All Arabic vowels are oral and fully voiced. The Modern Standard Arabic (MSA) vowel inventory does not contain any diphthongs. . *Newman, 2008)*

Table (3)

Arabic vowels

	Back	Central	Front
close	Ii		uu
Open		aa	

When taking into account that in many cases an Arabic word is only consisting of root consonant and short vowels, we can deduce that the Arabic script, without short vowels, can be difficult to read for poor and/or beginning readers. (*Abu-Rabia***, 2002***) Al-Wabil, Zaphiris, Wilson, (2006)* In this context Abu-Rabia and Siegel tested the effect of voweled and unvoweled Arabic sentence context on reading voweled and unvoweled words by skilled and poor Arabic readers. Their main findings show that for reading words, both skilled and poor readers, performed better with vowelized words than with unvowelized words; and both types of readers performed poorly (floor effect) when reading isolated and unvowelized words (*Abu-Rabia , 1997)* These results are consistent with Abu-Rabia's study in which he investigates the effect of vowels on reading accuracy in Arabic orthography. He finds that vowels significantly influence reading of poor and skilled readers in the four Arabic writing styles in the three reading conditions (*Abu-Rabia, 1998)*

4. 1. 3. Arabic Syllable

When taking into account the fact that there are close associations between consonants and vowels in the Arabic phonetic system, syllables could be conducted as the most important unit in the Arabic phonetic system, despite the lack of attention to it. A syllable is the collection of one or more sounds centered on a vowel. In Arabic there is a great variety of syllable structures. It can be divided into *(Albaidaq , 2008 (8) (Zahid ,2008 (11)*

- Short syllables which consist of consonant (C) and vowel (v) as in أَ◌َ; the syllabical indicator for this is (CV).
- Average syllable: which can be divided into:
  - Average closed syllable: which ends with a consonant , as قَد qad The syllabical indicator for it is (CVC)
  - Average open syllable: which ends with a vowel , as مَا maa The syllabical indicator for it is (CVV)
- Long syllable which ends with two forms
  - Syllable ends with (VC) as مِين miin in the word العالمين The syllabical indicator for it is (CVVC)
  - Syllable ends with (CC) as خوف Khawf The syllabical indicator for it is (CVCC)

A syllable in Arabic, no matter what the variety is, must be composed of a vowel (either short or long), an onset, and a coda. Both onset and coda can have two forms, a simple and a complex one.[5] *(Btoosh, 2006)*

[5] Review appendix (1)

4. 2. Arabic orthography system

Most Arabic letters have more than one written form, depending on a number of factors:

The dots: The Arabic script consists of 17 characters, which, with the addition of dots that are placed above or below various letters, make up the 28 letters of its alphabet. Therefore Arabic letters can be divided into categories according to the difference between the number of their dots. Dots appear with 15 letters, of which 10 have one dot, three have two dots, and two have three dots. In addition to the number, the position of the dots- either above or below the letter- is also of importance. For example, the difference between // ب / b/, / ت / / t/, // lies in the number of dots (one in / / ب /b/, two in / ت / /t/ or three in / ث /) or in their position (above in / ت / /t/ and // or below in / ب / /b/). ***(****Abu-Rabia; and Taha1 2006)* ***(****ELbeheri ;and Everatt , 2006)(Be´landa; and Mimouni (2001)*

Letters cursive nature: The cursive nature of the Arabic orthography means, that words are generally written joined up, but that there are also spaces in a continuous line of writing. *(ELbeheri; and Everatt , 2006).* In other words, Arabic characters can not be handwritten or typed in separate typefaces. Arabic letters are being joined to each other by means of ligatures and this leads to the fact that letter shapes in texts vary from their isolated form. Only 22 letters of the 28 of the conventional Arabic alphabet are two-way connectors (i.e., they join to both, the preceding and following letters), while the remaining 6 are one-way connecting letters (i.e., symbols that join to preceding ones only). These 6 one-way connecting letters in Arabic create one or more spaces within the same word depending on how many of these letters are contained within the word. For example, the Arabic word for student (طالب) contains a space that should not be interpreted as the end of one word and the beginning of another. The cur-

sive nature of the Arabic orthography and the additional problems caused by the 6 one-way connecting letters may make word boundaries in Arabic difficult to identify, particularly for the inexperienced beginning reader. *(Elbeheri, 2004) (ELbeheri; Everatt, 2006)),*

Modification of the graphic shape means that different graphemes assume various shapes depending on their position in the word. Letters modify their graphic shape according to their position within the word, being either 'initial', 'medial', 'final' or isolated. This condition may be partially responsible for the manifestations of dyslexia amongst monolingual Arabic readers *(Elbeheri, 2004) (Elbeheri; and Everat, 2006)* .

From the above brief description of the nature of the Arabic orthography, one can conclude that: the cursive nature of the Arabic orthography, the modification of the graphic shape and the elaborate use of dots to differentiate between different graphemes are all partially responsible for the manifestations of dyslexia amongst monolingual Arabic speakers. *(Elbeheri, 2004)*

4. 3. Nature of Arabic diglossia

Arabic native speaking children are born into a unique linguistic context called diglossia; the term *diglossia* describes a situation where two varieties of the same language are used for socially distinct functions. *(Elinor; and Haddad, 2005 (Abu-Rabia; and Taha, 2006)* The diglossic nature of Arabic has received considerable attention in literature, especially by Ferguson (see Amayrah 2007) who suggested that Arabic has two main varieties: High, which is very prestigious, particularly among educated speakers, and Low, which has no official status. Ferguson also suggested that the two forms are in complementary distribution with each other in terms

of situational usage. The High variety is primarily used in official contexts and literary discourse; whereas the Low variety is the medium of informal and everyday conversations (Jihad; *Mousa; and Amayreh 2007)* In this context *Elinor and Haddad (2005)* argued that there are two features defining a diglossic context in Arabic. The first is a differentiation between the written and the oral modes. The second is a rigid socio-functional complementarity of two separate sets of functions performed by two remarkably distinct, though linguistically related codes.

To illustrate the diglossic linguistic impact, *Elinor and Haddad* (2003, 2005) presented a number of elements of the difference between MSA (Modern Standard Arabic) and SAV (spoken Arabic vernaculars) in the domain of phonology, which have many effects on the learning of early reading. This can be summarized as follows:

1 - MSA and SAV are characterized by different or not identical phonemic inventories. For instance, whereas the phonemic inventory of MSA has three interdental fricatives voiced /ð/ and voiceless/θ/, and emphatic /ð̲/, as the first phonemes of the English words *then* and *thin*, respectively, these phonemes are absent from some of the spoken varieties of Arabic. In these varieties, when MSA words are also shared by the local vernacular, they are phonologically altered or pronounced differently from standard MSA phonemes and replaced by other phonemes that are within the specific spoken variety. For instance, the word /U*akar*/ (male) is pronounced /dakar/. Similarly, the word /*qali:l*/ (few) is pronounced /Gali:l/. In this context *Jihad; et al (2007)* conducted a study to identify the consonant profile of Arabic-speaking school-age children in Jordan. This study confirmed that there are six consonants /d̲/, /q/, /θ/, /ð/, /ð̲/ and /dʒ̇/ which are not listed among the acquired consonants. This seems natural as these consonants have dialectal variants that are coupled with the fact that the sub-

jects who belonged to different dialects gave the data mainly through spontaneous responses to stimulus pictures.

2 - Another phonological difference between MSA and the Arabic spoken vernaculars refers to the phonological composition of the syllable. For instance, whereas word initial consonant clusters are not permissible in MSA, they are quite frequent in colloquial Arabic. Thus, the MSA word /*tura:b*/(soil) becomes /tra:b/ in colloquial Arabic. At the same time, although word final consonant clusters are rare in spoken Arabic, they are among the most frequent monosyllabic word structures in MSA. Thus, an MSA word like /*sahl*/ (plain) becomes /sahel/ when used in colloquial Arabic. Similarly, the MSA words /*qalb*/ (heart) and / θalʒ/ (snow) become /Galeb/ and / talɨʒ /, respectively, with both, the MSA initial phoneme and the consonant cluster, rime coda altered in adjustment to the phonological system of the specific local vernacular.

The current study will take into account the results of studies regarding differences between MSA and SAV in the phonemic inventories and the phonological composition. It seems advisable to delay the introduction of the six consonants /d/, /ɑ/, /θ/, /ð/, /ð/ and /dʒ/ that are not listed among the acquired consonants during the early reading program in order not to cause confusion for the beginning readers.

4. 4. Nature of Arabic Transparent

The close correspondence between phonemes and graphemes is an important linguistic feature of the Arabic orthography that is expected to have an impact on the accuracy of single word decoding among Arabic speakers. We can refer to this close correspondence as *Transparent*. Transparent here means the association between written symbols and language sounds.

A transparent script has a simple one-to-one relationship; therefore transparent scripts are considered to have a shallow orthography. This term refers to the relative ease of deriving phonology from orthography due to the close one-to-one association between letters and sounds. In contrast, an opaque (sometimes also referred to as a deep orthography such as English) has a poor correspondence between written letters (graphemes) and language sounds (phonemes). *(ELbeheri; and Everatt, 2006)*

Because Arabic short vowels are not written as independent graphemes in the script but as diacritical marks in vowelized texts only, Arabic orthography is unusual in its transparency. The use of diacritical markers in beginning readers' texts makes the script highly transparent. However, these short vowel markers are absent in the majority of more advanced written works. This produces a highly opaque script with a large number of homographs (*Elbeheri;et al 2006)* which results in the existence of different pronunciations for the same phoneme. One can conclude that Arabic has two scripts: a shallow one, when diacritical marks are used in the text and on the other hand a deep (or opaque) one, when they are not. In this context, Abu-Rabia & Taha (2006) argued that in shallow orthographies like voweled Arabic, where the relationship between the orthographic and the phonological representations of words is highly regular and consistent, reading fluency would prove high, even among beginning readers *(Abu-Rabia;and Taha ,2006). Abu-Rabia (2002)* referred to the distinction between vowelised and unvowelised Arabic as the most important one in the reading process. When the Arabic is vowelised, the process is a direct letter-sound reading in which each word has a semantic autonomy in all reading conditions, which means in isolated or context related texts. This reading condition is more manageable for the poor readers and/or the beginning reader On the other hand the existence of the vowels facilitate the acquisition of phoneme grapheme correspondences for beginning readers;

however, if the words are isolated and not vowelised, reading is a difficult task for all types of readers.

4. 5. The challenges associated with dyslexia assessment and instruction in Arabic

There are a number of challenges that are specific to the Arabic language.

The first challenge is the fact that studies on the occurrence of dyslexia in Arabic have hitherto been rare. Dyslexia is not recognized as a specific reading difficulty and therefore academic research on dyslexia is scarce

Currently, there are no methods of identification, assessment, diagnosis or treatment for dyslexia available to either educational psychologists or special educational teachers.

Some teachers or educational psychologists who have to face this problem start using English tests and programs which have been standardized on English- or American-speaking students. Generally Arabic standardized tests and remediation programs are rarely used, either because they are few in number or because those, administering the assessment process, do not speak Arabic and therefore cannot use them. Even if an assessor can use an Arabic version, research is necessary to ensure that the test is appropriate for the context of testing, and that norms are representative of all populations in which the test is used.

Another equally relevant and important issue is the vernacular of the individual being assessed and the frequency and familiarity of the vocabulary that makes up the test items. There are 22 countries in the Middle East region where Arabic is the official language. Although Modern Standard Arabic is the unifying Pan-Arabic language spoken by more than 300 million native Arabic speakers, regional variations do exist among native

speakers. Such differences lead to a decrease in mutual intelligibility once the geographical distance between native speakers increases. Given that test measures will typically involve one individual verbally presenting information to another, such large differences in dialect need to be considered, particularly when assessments involve the need for precise articulation and the recognition of articulation. This is the case in most measures of phonological awareness, which are typical of most dyslexia assessment procedures.

The reliance on an English speaking assessor has been chosen to assess Arabic students simply because of the preference of a foreign assessor who, it is assumed, would do a better job and be better equipped than an Arabic-speaking assessor. However, a foreign (probably English-speaking) assessor may not have sufficient knowledge of the Arabic language to enable her or him to carry out a thorough assessment that might include indications of first language capability. *Elbeheri; et al (2006)*

Based on the above, it could be suggested that there is a need in Arab environment for diagnosis and treatment instruments which are standardized on Arab speaking students. It also has to be taken into account the use of a high Arabic language level to try to get rid of the negative impact of the vernacular on the diagnosis and treatment of dyslexia.

Chapter III: Phonological Awareness: Definition, importance, development, Assessment, Instruction

This chapter aims at defining the term Phonological Awareness, its development levels and methods of its measuring and teaching in order to make use of all of these when constructing the diagnostic and remedial programs; therefore it contains the following elements:

- The definition of Phonological Awareness.
- The importance of Phonological Awareness.
- The development of Phonological Awareness
- Assessment of Phonological Awareness.
- Instruction of Phonological Awareness

1. Definition of Phonological Awareness

Although there have been many definitions provided for the term Phonological Awareness, it is clear that these definitions take one of two possible directions. The **first** focuses on the broad sense which refers to the analysis of broader sound structures such as words, rhyming and syllables. An example for this direction are *Vaughn; and Bos (2009*) who defined it as "knowing and demonstrating that spoken language can be broken down into smaller units (words, syllables, phonemes), which can be manipulated within an alphabetic system or orthography"; whereas *Smith; et al* (2001) refer to it as" the awareness that words are composed of sounds , demonstrated by the ability to hear and orally manipulate sounds in spoken language (e.g., words, syllables, onset-rimes , and phonemes)." *Runge; Watkins* 2006 defines it as "the understanding that oral language (i.e., sentences, words, syllables) can be divided into smaller components and ma-

nipulated. Thus sentences can be divided into words, words into syllables, and syllables into phonemes" Similarly, *Shanahan* (2006) also defines it as "the sensitivity to the phonological or sound structure of words. It includes phonemic awareness, but also encompasses many earlier developing skills such as the awareness of syllables or rhyme".

Phonological awareness in this sense is a necessary precursor of reading, despite its developing far before insight into the alphabetic principle is gained; it plays an important role in facilitating insight into the alphabetic code. *(Schneider; et al: 2000)*

The **second** focus narrowly concentrates on the ability to isolate phonemes within words and syllables. An example for this direction is *Picard* (2002) who defines it as "the conscious ability to manipulate the individual speech sounds of one's language" Whereas *Patrick; Walton* (2002) refers to it as "conscious access to the component sounds of speech within words and the ability to manipulate these sounds". Consequently the phonological awareness in this sense is rarely observed before children learn to read and spell. (*Schneider; et al : 2000)*

Perhaps this difference is due to confusions between the terms Phonological awareness and Phonemic awareness; so it is useful to demonstrate the term Phonemic awareness to distinguish the two related terms.

Vaughn; and Bos" (2009) defines Phonemic awareness as "the ability to recognize the smallest sound units of spoken language and how these units of sound, or *phonemes*, can be separated (pulled apart or segmented), blended (put back together), and manipulated (added, deleted, and substituted). Whereas the *Louisiana Department of Education* (2002) refer to it as the part of PA which is focused only on the manipulation of phonemes.

Based on the foregoing it could be said that the concept Phonological awareness is actually a broader concept, which includes the rhyme, syllables, rime, and onset. Consequently phonemic awareness is a part of this larger idea.

For the current study Phonological awareness shall mean an auditory-based task which reflects in recognizing, assembling, disassembling, and manipulating (adding, deleting, and substituting) spoken language units (rhyme, words, syllables, onset-rimes, and phonemes) that are based on hearing.

2. The importance of Phonological Awareness

Recent research sheds light on issues related to the importance of Phonological Awareness. Although the studies vary in the activities used, their duration and intensity of training, and the number of children included in the program, the outcome across countries and orthographies are similar. It states that trained children usually outperforme the untreated-control children on most measures of phonological awareness taken shortly after completion of the training program. (*Allinder; et al: 2002)*

Regarding reading success, *Picard* (2002) has shown that phonological awareness is one of its key predictors. Although some students arrive at school with well-developed phonological awareness skills, it is clear that many do not. *Castles; and Coltheart* (2004) demonstrate the critical importance of phonological awareness in the process of learning to read as the earliest stages of reading acquisition *Walton; and Walton* (2002) suggest the strong link between ability in phonological awareness and pro-

gress when learning to read, which supports the interactive relations between the development of phonological awareness and reading. Whereas *Savage* (2003) stresses the importance of it in facilitating children's early reading development. *Castles; and Coltheart* (2004) demonstrate that the relationship between performance on phonological awareness tasks and reading ability is undisputed. A large amount of evidence has now been accumulated to show that the more knowledge children have about the constituent sounds of words, the better they tend to be at reading. This evidence has been in form of concurrent correlations, that's to say that the phonological awareness and reading have been measured at the same time, and also in form of predictive correlations, where phonological awareness has been assessed at one point at a time and reading at some later stage.

With respect to the importance of Phonological Awareness for word decoding *de Jong and van der Leij* (2002) examined the specific effects of phonological abilities and linguistic comprehension on the development of word-decoding ability and reading comprehension in a longitudinal study with 141 Dutch children who reached from the end of first grade to the end of third grade. The results indicate that phonological abilities were highly associated with word decoding but did not have an additional influence on the further development of word decoding after first grade. *Frost; et al,* (2005) conducted a longitudinal study to investigate the relationship between pre-school semantic skills (vocabulary, comprehension and sentence construction), phonological awareness and later word decoding and reading comprehension skills. The results show that the phonological variables at the age of six predict the reading development significantly at the age of 16. Phonological awareness at the age of 6 seems to have the greatest influence on reading at the beginning of Grade 2 compared to the semantic variables at the age of three. In the same context *Holopainen; Aho; Lyytinen,* (2001) assessed a random sample of 91 preschool children prior to receiving formal reading instruction. Verbal and nonverbal measures were

used as predictors for the time of instruction that was required to accurately decode pseudo-words in the highly orthographically regular Finnish language. The results showed that Phonological awareness only played a significant role in differentiating PD (who could read at school entry) from ED (early decoders) and OD (who learned to read within 9 months).

For dyslexic or at risk children *Carrol; et al, (*2003) indicated that Phonological awareness is one of the most important predictors of reading in normally developing children. In addition, children with dyslexia often show phonological processing difficulties, where training in phonological awareness can improve the efficiency of reading instruction.

With respect to the importance of Phonological Awareness for new Arab readers, *al Mannai1; and Everatt (2005)* conducted a study to identify the best predictors of literacy skills amongst Arabic young readers. The target sample included grades 1–3 of Arabic-speaking children in Bahrain. Children were tested on their literacy skills (single word reading and spelling), their ability to decode letter strings (non-word reading) and their measure of phonological awareness, short-term memory, speed of processing and non-verbal ability. The results were consistent with the literature based on tests of English-speaking children with regard to the fact that measures of phonological skills (decoding and awareness) were the best predictors of variability in reading and spelling among the Bahraini children. Whereas *Elbeherii; and Everatt (2006)* investigated the relationship between phonological processing and reading ability amongst grade 4 and grade 5 of Arabic speaking children in Egypt. In addition to measuring the reading level, the study assessed the children's ability to identify rhymes, delete individual phonemes from words, retain and manipulate sequences of digit names and rapidly access verbal labels. Further literacy and literacy-related tasks required children to decode novel letter strings, to distinguish

similar words, to identify words within letter chains and to correctly spell dictated texts. A non-verbal ability measure was also included to allow comparisons to be made between groups of poor readers with good non-verbal skills (dyslexics) and a control group of chronological- age-matched normal readers with equivalent average scores on the non-verbal task. Results indicated relationships between literacy ability, decoding and phonological processing within this cohort. It as well identified differences between the dyslexic and the control groups, which suggest that Arabic dyslexics show signs of poor phonological skills. The study supports the view that Arabic dyslexic children have impairments in the phonological processing domain. The results indicate a relationship between measures of phonological processing and reading ability.

Despite the abundance of evidence, which reports that phonological awareness skills are related to the development of later reading skills, it is important to note that phonological skills alone, although critical, are not sufficient for reading skills development. Several studies demonstrate that pairing instruction in phonological skills with training in letter knowledge and the alphabetic principle (i.e. that phonemes are represented by letters) has a greater impact on reading ability than training in phonological skills alone. In this context *Schneider; et al,* (2000) compared the effects of 3 kindergarten intervention programs on at-risk children's subsequent reading and spelling skills. From a sample of 726 screened kindergarten children, 138 were selected as children potentially at risk for dyslexia and randomly assigned to 1 of 3 training conditions: (a) letter-sound training, (b) phonological awareness training, and (c) combined training in phonological awareness and letter knowledge. A control group of 115 unselected ("normal") kindergarten children was also built. The findings confirm the phonological linkage hypothesis which states that combining phonological awareness training with instruction in letter-sound knowledge has more powerful effects on subsequent literacy achievement than phonological

awareness training alone. C*hristensen; and Bowey* (2005) compared the efficiency of two decoding skill- based programs, one based on explicit orthographic rhyme and one on grapheme- phoneme correspondences, the control group was exposed to an implicit phonics program. Children of both explicit decoding programs performed consistently better than the control group in the accuracy with which they read and spelled words covered in the program. Whereas results of *Shah's* study (2002) support the effectiveness of phoneme-grapheme correspondence and phonemic segmentation and manipulation instruction on encoding skills in children with severe speech impairment.

Based on the foregoing it could be argued that there is a kind of interrelationship between letter-sound knowledge and phonological awareness. This is called the "phonological linkage hypothesis". It assumes that training in phonological skills in isolation from reading and spelling skills may be much less effective than a training that forms explicit links between children's underlying phonological skills and their experiences in learning how to read and spell *Schneider; et al,* 2000) . This view of relationship has been supported by *Carroll* (2004) Researchers which investigated the influence of letter knowledge on the development of phoneme awareness used two studies: a longitudinal study and a letter training intervention study. In both cases, letter knowledge was related to the development of phoneme awareness. Both studies also suggest that letter knowledge was most directly related to performance on the phoneme completion task, though it was also important for the initial phoneme matching and phoneme deletion tasks. On the other side *Savage, Carless* (2004) suggest that, at least after children have learned some letter-sound correspondences, there is an additional contribution from phoneme manipulation skills in the development of further levels of letter-sound with instruction.

Considering the above it could be concluded that it is better for phonological awareness training if it is linked to and complemented by an introduction into grapheme-phoneme correspondence, because children may learn more about the phonetic structure of words when they learn how to interpret spellings as maps of pronunciations Also, a distinct visual symbol for each phoneme may anchor the phonemes perceptually.

3. The development of phonological awareness

The research on phonological awareness development suggests that the process of skill acquisition tends to follow one of the following four models:

3. 1. Task difficulty model:

This model focuses on the progressive acquisition of increasingly greater levels of phonological processing skill. This progression generally follows the trend of a) detecting distinct auditory units, b) manipulating the units, and c) eventually connecting the auditory stimuli to alphabetic representations in written language. (*Cassady, and Smith, 2002)*

As an example of this model, Adams review of the literature on phonological awareness includes an explanation of five levels of tasks encompassing the rang of activities considered to represent a more or less sophisticated understanding of the sound structure of English language. Adams describes the first level as having an ear of sounds; this involves knowledge of nursery rhymes and the sense of patterns in rhyming. (e.g. “this old man ……. played one ……on my thumb, played two ….. on my shoe) Tasks within the second level are referred to as oddity tasks involving the ability to compare and contrast sounds, as in rhyme and alliteration. In an oddity task the child is given several words and then asked which one

doesn't belong because of different sounds. The difference might be in the first sound (e.g. dig, dot, pan), the final sound (e.g. sock, leg, rake) or the middle sound (had, pig, bat). With middle sound identification it is the most difficult. Phoneme matching as in matching the initial sound or recognizing rhyming words is also a level 2 task. The third level, proposed by Adams, is the ability to blend individual phonemes into words, for example a child is asked what / c /…./ a /…./ p / says when all the sounds are put together. The manipulation of phonemes is the type of task included in the fourth level of phonemic awareness. This level involves the isolation of the individual phonemes and then deletes, records or adds extra phonemes. An example for this is "say book without / b /. Finally the fifth level includes phoneme segmentation tasks; at this level a child can hear, segment, and tap out the separate phonemes in each word. A child is for example asked to "say a word sound by sound" such as / f /…./ i /…./ sh / for fish. *(Sondoro; et al, 2002). Gonzalez; and Gonzalez (1994)* designed a study to compare different levels of phonological awareness in a sample of Spanish pre-reader children. The results show that phonological awareness includes four levels: syllabic awareness, intrasyllabic awareness, vowel phonemic awareness, and consonantal phonemic awareness. Whereas (*Steven; et al, 2000)* propose that phonological awareness can be broken down into awareness of consonants, awareness of vowels and awareness of consonant blends. In *Stahl; and Murray´s (1994)* study a sample of 113 kindergartners and first graders completed phonological awareness tasks that were designed to separate task difficulty from linguistic complexity. These measures were, in turn, compared to measures of early literacy. Results indicate that the phoneme isolation is the easiest task, followed by blending, deletion, and segmentation.

3. 2. Linguistic Complexity Model:

This model states that the linguistic complexity or linguistic status is considered the developmental factor. In this model, phonological awareness development follows a progression in which children are sensitive to smaller and smaller units of sound. This stage-like development progresses from sensitivity to larger linguistic units that are based on the concrete physical characteristics of an auditory stimulus (words, syllables) to smaller abstract linguistic units that have only a psychological reality (phonemes). *Lonigan,* 2006) In other words, investigators have found that children learn to manipulate words before syllables, syllables before onsets and rime and onsets and rime before phonemes; thus achieving syllabic awareness earlier than phoneme awareness and awareness of intrasyllabic units (i.e., onsets – rime prior to awareness of phoneme. Few or no children, for instance, should be able to blend phonemes before they can blend words, syllables, or onsets and rime".

This means that "in accordance with this model", a skill is learned and completely mastered prior to learning a subsequent phonological skill. Mastery is necessary in one skill before moving to the next *Kelman, 2006*)

One generalization of these models is centered on the difference of difficulty for epilinguistic skills and metalinguistic skills. This was proposed by Gombert, who has suggested that phonological awareness could be separated into two types: epilinguistic awareness and metalinguistic awareness. *Epilinguistic awareness* consists of a global sensitivity to similarities between speech sounds; whereas *metalinguistic awareness* consists of a conscious awareness of phonological segments within words, normally phonemes. (See: *Carrol; Snowling; et al, 2003)*

A different conceptualization was submitted in (*Ziegler, and Goswami´s 2005)* study, which aimed at developing a novel theoretical framework to explain the lexical organization and processing strategies that are characteristic of skilled reading in different orthographies, affected by different developmental constraints in different writing systems. The results show that the emergence of phonological awareness can be best described along a continuum from shallow sensitivity of large phonological units to a deep awareness of small phonological units, which means that children's progression of sensitivity to linguistic units follow the hierarchical model of words. That is to say, children generally mastered word-level skills before they mastered syllable-level skills, syllable- level skills before onset–rime skills, and onset–rime-level skills before phoneme-level skills, controlling for task complexity. In other words, children progress through three levels of Phonological awareness: from awareness of syllables to awareness of onsets and rimes, and finally to phoneme awareness.

3. 3. Integrated Model

Cassady, and Smith (2002) suggested the *Integrated Model* which is founded on the simultaneous examination of phonological processing task difficulty (e.g., blending vs. segmenting) and linguistic complexity (e.g., onset-rime vs. phoneme). To explore the nature of phonological awareness, this model employed a new assessment tool that consisting of 13 subtests targeting specific phonological processing activities. The new assessment tool was designed to specifically target one primary phonological awareness task in each subtest, avoiding the common confounding results observed in previous models

Table (4)

Summary of the 13 subtests, with sample items and abstracted directions to illustrate the procedures.

Subtest	Abridged Instructions	Sample Item(s)
Rhyme recognition	Rhymes are words that sound the same at the end… Tell me if these words rhyme	ape-knee; dip-hip
Rhyme application	Tell me a word that rhymes with:	star (accept any word or nonsense word that rhymes)
Oddity tasks: Beginning	Listen to the names of these pictures. Tell me which one has a different beginning sound.	duck, door, foot
Oddity tasks: Ending	Listen to the names of these pictures. Tell me which one has a different ending sound.	seal, cat, pail
Oddity tasks: Middle	Listen to the names of these pictures. Tell me which one has a different middle sound.	jack, cap, run
Blend onset-rimes	I will say the first sound and then the rest of the word to make a whole word… Tell me the word I have when I put these sounds together	/w/ eek
Blend phonemes	I'm going to say a word slowly, and then I'll say it fast, /s/ /u/ /n/. sun.	I'll say a word slowly. You say it fast /s/ /a/ /ve/
Segment onset-rimes	Separate the word by saying the first sound and then the rest of the word:	Separate the word boat by saying the first sound and then the rest of the word.
Segment phonemes	Say each sound you hear in the word:	job
Phoneme deletion	Listen to the word ____. Take away the first sound, what is left?	Listen to the word book. Take away the /b/ sound, what is left?
Phoneme substitution: Beginning sounds	If I say the word man and change the first sound to /p/, the new word is pan.	Change the first sound in cat to /h/. What is the new word?
Phoneme substitution: Ending sounds	If I say the word rat and change the last sound to /g/, the new word is rag.	Say the word can. Change the last sound to /p/. What's the new word?
Phoneme substitution: Middle sounds	If I say the word pan and change the middle sound to /i/, the new word is pin.	Say th word cat. Change the middle sound to /o/. What's the new word?

3. 4. Item response theory (IRT)

The Item response theory (IRT), also known as latent trait theory, is based on the concept that responses to items vary according to: a) the latent trait- an individual's ability level or characteristics of individuals. b) the underlying construct or characteristics of items (*Adedoyin;.et al, 2008 Leeson; and Fletcher, 2008*). This means that the difficulty of the items and the ability of persons are scaled on the same metric. There are two assumptions for the specification of IRT models. First of all, it is assumed that the ability to be measured is one-dimensional. Secondly, it is assumed that the relation between the latent trait and the probability of a correct response on a particular item can be described by the item characteristic curve (ICC). This curve is defined by one or more parameters, which determine the exact shape of the ICC *Vloedgraven; and Verhoeven, 2007*)

An example in which the investigation on the development of phonological awareness is applied, is a study conducted by *Vloedgraven; and Verhoeven, (2007)* It aims at exploring whether the different sets of items, that are intended to measure phonological awareness, appear to reflect a single underlying latent ability or several related abilities. The study also explores the possibilities for the assessment of growth in phonological awareness of children in kindergarten and first grade. Phonological awareness was measured by using four sets of items involving rhyming, phoneme identification, phoneme blending, and phoneme segmentation. The results of analyses conducted within the framework of the item response theory showed one latent ability to underlie the different sets of items, which nevertheless differed in difficulty. The next issue was the relative difficulty of the different sets of items. The results of analyses showed the sets of items to differ in difficulty. The rhyming items appeared to be the easiest and the segmentation items appeared to be the most difficult; the phoneme blending and phoneme identification items were placed in be-

tween. The differences between all of the pairs of item sets were significant, with the exception of the difference between the items of phoneme blending and phoneme identification. In sum, the results of the study have shown that it is possible to measure growth in phonological awareness. The various sets of items that were used to measure phonological awareness could be placed along a single ability scale and were found to measure changes in phonological awareness (i.e., growth). However, a refinement of the ability scale is necessary to attain more accurate ability estimates for the higher end of the ability range.

4. The importance of early phonological awareness assessment and instruction

The impact of phonological awareness on the development of reading has been one of the most important things learned about reading in the last two decades. (*Goswami, 2002)* Therefore it was indicated that phonological awareness abilities account for significant differences between good and poor readers.

Although the Phonological awareness might be developed through spontaneous experiences with language and the alphabetic system, it has been found that some children enter school without the ability to analyze the sound structure of words, which places them at risk for having difficulties with reading. *Wanzek; et al, (2003)* indicated that children with deficiencies in phonological awareness often don't develop early reading skills and begin to struggle by the time they enter first grade.

The stability of individual differences in young children's´ phonological processing abilities highlights the value of early screening and instruction of phonological awareness in order to identify children who may be at risk

for reading difficulties. In this context *Guidry (2003)* concluded that the results of phonological awareness research on assessment and intervention support two major suppositions. Firstly, findings from correlation studies reveal that young children's phonological sensitivity is related to the future development of reading skills, which validates the importance of early screening of phonological awareness to identify children who may be at risk for encountering reading difficulties. Secondly, experimental studies that examine the effectiveness of phonological awareness instruction demonstrate that young children's phonological sensitivity can be promoted by altering patterns of initial weaknesses.

Researchers believe that better procedures and measures are needed for screening children that are at risk for reading difficulties. Screeners should include phonological awareness or processing as part of the screening process. *(Riccio; et al, 2008*) The early assessment of phonological sensitivity can provide important information to be used in the development of strategies that effectively facilitate growth in phonological awareness for all children. This may mean speeding early reading skills for normal children, and preventing at risk children from developing weaknesses.

Based upon the screening process, proactive interventions could then be implemented for identified children in order to reduce the number of children who have continued difficulty in phonological awareness and therefore require special services. In this context *Guidry (2003)* indicated that, when children with low pre-training scores on measures of phonological awareness, as well as children with general language delays, were provided with phonological awareness instruction, their levels of phonological sensitivity and early reading skills were brought to levels similar to those children who had high levels of initial phonological sensitivity.

5. Assessment of the Phonological Awareness

There are many tests of phonological awareness, and many criteria that could, in accordance with it, classify these tests. One of the most important criteria is the targeted sample.

According to this criterion, there are tests which extended its targeted samples to include adults. As an example of this kind of test, *Lindamood (1979)* introduced the auditory Conceptualization Test (LAC-3) which is administered to individuals from the age of 5 through 18 years; the test takes about 20–30 minutes. It measures the ability to distinguish and manipulate sounds, which is required for success in reading and spelling. The test uses colored blocks to allow the student to visually present and manipulate representations of phonemes, and felt pads to manipulate the representations of syllables. All words used in this assessment are nonsense words. *Wagner; Torgesen;and Rashotte (1999*) designed the Comprehensive Test of Phonological Processing CTOPP to target a population ranged between 5–24 years old, to assesses phonological awareness, phonological memory and rapid naming to determine strengths and weaknesses of an individual's developed phonological processes and to document an individual's progress in phonological processing as a consequence of special intervention programs. It is an individually administered test that comes in two versions. The first version was developed for five to six-year-old children and the second version was developed for individuals seven through 24 years old; it can be administered in 30 minutes. Whereas *Hoover; et al, (2001)* developed tests of Basic Skills (ITBS) which could be used for kindergarten through Grade 8 (Levels 5 – 14). The test aims at assessing student's phonological awareness and understanding of word parts. At levels 5 and 6, the focus is on letter identification and letter-sound relationships. Levels 7 through 9 also include basic letter-sound questions, but in a more complex way. Each test takes 30 minutes or less to administer.

Good; and Kaminski (2002). Introduced the Dynamic Indicators test of Basic Early Literacy Skills (DIBELS) which can administer to individuals to assess the phonological awareness, alphabetic principle and fluency with connected texts in grades K-6. It primarily assesses three skills: Phonological Awareness, Alphabetic Principle and Fluency with connected texts. The time used varies from one to three minutes depending on which measure is being administered. *Torgensen; and Bryant (2004*) designed the Test of Phonological Awareness (TOPA-2+) to be administered in groups with children of the age 5 through 8; to determine if first and second-grade students' difficulties in early reading are associated with delays in the development of phonological awareness. It includes two versions, a kindergarten and an early elementary one, that measure young children's ability to isolate individual phonemes in spoken words and to understand the relationship between letters and phonemes in English. The time of administration varies, the kindergarten version takes 30-45 minutes; the early elementary version 15-30 minutes.

While there are tests which limit their targeted population to kindergarten or first grade at risk children only, such as *Yopp-Singer (1995) who* introduced the Test of Phoneme Segmentation which is specifically designed to assess children's ability to isolate and pronounce the individual phonemes in words. It consists of 22 items and could be used to monitor the growth of phonemic awareness; it can be either administered to kindergarten children or children who are weak in phonological awareness during first grade and it can be administered in 5: 10 minutes per child. *Robertson; and Salter (1997)* developed the Phonological Awareness test which can be administered individually in 40 minutes to children five years of age and older; it measures the student's phonological sensitivity and phonemic reading ability. It consists of five measures of phonological awareness, plus measures of word, syllable segmentation and a measure of sensitivity to rhyme. It also contains three additional subtests that measure the knowl-

edge of letter-sound correspondences, phonemic decoding (ability to read regular non-words phonetically) and invented spelling. *Jansen; et al, (2002)* developed *the Bielefelder Screening (BISC)* which can be administered individually in approximately 20-25 minutes. The best time for this test is ten months before enrolment and four months before enrolment, to specifically identify children at risk for later reading/spelling deficits as early as possible. The BISC test consists of several subtests, not only probing phonological awareness (rhyme detection, syllable segmentation, sound identification, and sound blending), but also attention and memory (rapid naming, phonological short term memory, and visual attention). *Invernizzi, at al, (2004* designed Phonological Awareness and Literacy Screening (PALS-PreK) which can be administered in 20-25 minutes and is meant for pre-kindergarten and early kindergarten children to measures preschooler´s developing knowledge of important literacy fundamentals. The assessment reflects skills that are predictive of future reading success and it also measures name writing ability, upper and lower-case alphabet recognition, letter sound and beginning sound production, print and word awareness and rhyme awareness. Whereas *Invernizzi; et al, (2002).*introduced the Phonological Awareness and Literacy Screening – Kindergarten test (PALS-K), which is also administered in 20-25 minutes, and originally aims at identifying students who are at risk for reading difficulties and delays. The *phonological awareness* component of it is a measure of young children's ability to identify rhyme units and to isolate beginning sounds. Whereas the *literacy* component of it includes a measure of young children's knowledge of important literacy fundamentals: (a) alphabet knowledge, (b) knowledge of letter sounds (c) phoneme-grapheme correspondences, (d) concept-of-word, and (e) word recognition. *Mannhaupt (2007)* developed the Münsteraner Screening (MÜSC) *w*hich is administered in groups in 40 minutes, and it aims at an early detection of reading difficulties (identification of children at risk for later reading deficits). It is a diagnostic procedure that is collecting information

of the necessary prerequisites for successful reading and letter learning at the beginning of the first school year, so that it is used in the first weeks after school starts. It is based on two components, namely the phonological awareness which includes rhyme detection, syllable segmentation, sound identification and sound blending and it is also based on attention and memory which include rapid naming, phonological short term memory and visual attention.

From the previous explanation of the tests it is clear that:

- Some of these tests focus on the pre-school and some on the first months of the first grades of primary school, which supports the idea of the current study, namely that the importance in developing a skills test for diagnosis of the phonological awareness lies in testing it during the first weeks of first grade of primary school in order to be able to design early preventive programs, thus limiting the development of dyslexia.
- Test's administration varies between individual and group administration. For this current study it appears that the group administration is more suitable for Egypt schools; because of the increasing density of pupils in a class.
- All these tests were prepared by non-Arab speakers and also for non-Arab environments, which supports the importance of designing and developing a test in Arabic commensurate with the nature of Arab language and environment.

6. Instruction of the Phonological Awareness

There is plenty of evidence that the training phonological awareness has important implications for the acquisition of reading and spelling in school

for normal children, at risk children and also for children who have experienced difficulties in learning to read. These phonological awareness training programs vary depending on the diversity of the target groups.

To give an example of phonological awareness programs for normal children, *Catts, and Vartiainen (1993)* can be named. They designed the Sounds Abound program which helps kindergarten and first grade children to become aware of the speech sounds in words and how the alphabet represents these sounds. This program is not presented as an organized curriculum but the order of activities moves gradually from easy to more difficult, so that it could be used by teachers or parents to strengthen phonological awareness in small groups of children. Its activities focus on four broad areas: Rhyme (identification and production), beginning and ending sounds (identification and production), segmenting and blending (syllables and sounds), and putting sounds together with letters. Whereas *Lenchner; and Podhajski (1997)* introduced Sound Start: a program to teach phonological awareness in the classroom which aims at stimulating phonological awareness appropriate for pre-school through first grade children. It is designed to serve as a regular class curriculum in phonological awareness by providing main instructional practice as well as extra instruction and practice for children who are having difficulties in mastering the skills, the program includes: rhyme **(**recognition, completion and production), syllables (segmentation and deletion) and matching letters to first sounds in words. The program demonstrates videos that provide delightful examples of many of the activities being performed by the author with a small group of children.

For children who have experienced difficulties in learning to read *Adams, et al, (1997)* introduced phonemic awareness in young children: A classroom curriculum which aims at building phonological awareness in kindergarten, and classrooms, it is also meant for first graders who are lag-

ging behind their peers. Based on a series of game-like activities, that can be used with large or small groups, the program contains activities that are graded in difficulty such as: listening games, rhyming, syllables (count and blend), initial and final sounds (identification, pronunciation, substitution), phoneme identification and blend and letters. The goal of all the activities is for the children to have fun while learning to listen for the sounds in words. *Robertson; and Salter (1995)* came up with the phonological awareness kit; which is a beginning and intermediate program for students who have experienced difficulties in learning to read. As a direct instruction supplemental phonological awareness approach, it comes in two versions. The beginning kit is designed for a small group or a whole classroom instruction with children in kindergarten through 2nd grade whereas the intermediate kit is appropriate for individual or small group instruction with 3rd through 8th grade children who are having difficulties acquiring phonemic awareness and phonetic reading skills. The activities in this program are not embedded in game, but they are still intended to be fun and could easily be adapted for use within games. The beginning level kit includes: rhyme, sentence word segmentation, syllable counting, phonemes (isolation, segmentation, blending, deletion and substitution) while the Intermediate Level Kit includes syllables (isolating, counting and deletion), phonemes (isolation, blending, segmenting, deletion and substitution) and activities with letters.

When taking into account at risk children and children lagged behind *Ervin (2004)* designed the Right into Reading Program which aims at developing phonemic awareness, phonics, comprehension, vocabulary and fluency for beginning readers, children at risk, or older children who are having difficulties learning to read. Phonic skills are introduced in a carefully ordered sequence where at the beginning of the lesson the sound being taught is emphasized in red letters at the beginning of the text; the stories read contain only the sounds that have been taught. It includes four

workbooks which -jumping right into reading- introduce the letters of the alphabet (only regular sounds). Grades 1–2: book covers short vowels, blend syllables and long vowels; grades 2–3: book covers consonant teams (sh, ch, th, and wh), vowels and irregular double vowels; grades 3–4: book covers the advanced phonics skills necessary for students to read fluently with comprehension. *Mannhaupt (2006)* developed the Münsteraner Trainingsprogramm. MÜTER is designed for first graders who are lagging behind their peers and for children at risk of reading problems in the first half of the first class, to develop phonological awareness and letter sound correspondences. The MÜTER includes 80 units, each unit takes about 10 to 15 minutes. A regular daily lesson is carried out with group sizes of at least four and a maximum of eight children, and that the training covers 6 months of a school semester. The program includes exercises and games in sentences and words, segmenting and blending, syllables (counting, blending and segmenting), phonemes (isolation, segmentation, blending, deletion and substitution) and letters sounds (correspondences).

From the previous explanation of the training programs it is clear that:

- Most of these training programs focus on phonological awareness in a broad sense: words, rhymes and syllables ending with the level of phonemes. The current study focuses only on the level of words, rhymes and syllables because it is based on the nature of the Arabic language, which includes a close relationship between the pronunciation of the phoneme in the word and the short or long vowel following it. Thus, it is possible to make a short syllable by turning the phoneme and adding a vowel to it.
- Small-group instruction is more effective in phonological awareness than one-on-one and whole group instruction.
- The daily focus on phonological awareness activities will produce much more consistent growth than sporadic or irregular intervals of instruction.

- Pairing instruction in phonological skills with training in letter knowledge has a greater impact on the reading ability than does training in phonological skills only.
- All these intervention programs were prepared by non-Arab languages and for non-Arab environments also, which supports the importance of building an intervention program in Arabic commensurate with the nature of Arab language and environment.

Chapter IV: Methodology

This chapter aims at describing the methodology used to address the research questions, so that it includes the two phases of a preventative program (Diagnostic and Intervention).

1. Diagnostic phase

Research over the past two decades has consistently shown that children with poor phonological awareness and phoneme-grapheme correspondence on entering school are more likely to be poorer readers and spellers than those with high levels. Because academic success is largely dependent upon reading, teachers need a quick and accurate way to identify potential reading problems as early as possible. This is also the basic goal for the current study; in the following are a description of the diagnostic instrument, development, and implementation as part of the current study.

1.1 Test design

The test design includes determining the test purpose, the description, and components.

1. 1. 1. **Purpose**

The major purpose of the test is the early identification of reading difficulties **(**identification of children at risk for later reading deficits) in two fields: phonological awareness and letter sound correspondence.

1. 1. 2. Test description

The test includes five sub skills; a brief description for each of these sub skills follows.

Rhyme

In the rhyme task, children are told ‘we are going to play a game of words similar in sound, like this: Messbaah (Light) …. Muftaah (the key), Shaar (hair)….. Tammr (dates). Then the examiner tells the children that he or she will say a word and that they have to look at the three pictures and identify which of these pictures is similar (rhymed) to the spoken-word in sound. In the rhyme-matching task there are three practice trials, where feedback and modeling of successful answers are given, followed by the ten experimental trials where no feedback or modeling is given.

Syllables segmentation

In the syllables segmentation task the children are told that they are going to play a game of pronunciation. The word بَابٌ: baabon (door) could be said like this Baa (بَا)… bon (بٌ), the examiner clap his hands in an unheard way with every syllable according to the number of syllables in the word. The examiner also draws a small boat for every part of the word, where one boat represents one part. 

Then, the children are told that the examiner will say a word and that they have to say it again in the same way in which they have learned it (unheard clapping with every part of the word) and that they have to draw a small boat for every part of the word in the empty space next to the picture. In the Syllables segmentation task there are three practice trials, where feed-back and modeling of successful answers are given, then follow the ten experimental trials where no feedback or modeling is given.

Syllables blending

In the Syllables blending task children are told that they are going to play a game of guessing; the examiner will say something and the children have to guess, what this thing might be and extract its picture from the four pictures present, like this:

فى - ---- لٌ. (fee..... lon) (elephant) what was the examiner speaking about now? In the Syllables blending task there are three practice trials, where feedback and modeling of successful answers are given, followed by the ten experimental trials where no feedback or modeling is given.

First syllable identification

In the First syllable identification task children are told that they are going to play a game where they must be listening carefully. The examiner will say a syllable aloud, and then the children tell him if they have heard the certain syllable in one of these words; the examiner refers to the pictures and at the same time pronounces the name of each: جَمَلٌ (Gamaln) this camel, حَقِبَةٌ (Haqubatn) this bag, مَوزٌ (Maozon) this: bananas. The examiner then asks in which word they have heard the syllable (جَ) (Ga) . In the First syllable identification task there are three practice trials, where feedback and modeling of successful answers are given, followed by the ten experimental trials where no feedback or modeling is given.

Phoneme grapheme correspondence

In the Phoneme grapheme correspondence task children are told “we are going to play a game of letters and words that sound similar.” The examiner will say the word: كِتَابٌ (Kitaabon) (Book), and they can see three letters in the first row, one of these letters gives them a similar first sound as in كِتَابٌ (book) "ع – ل – ك“ (kaaf – laam – aiin) Then the children are asked in which of these letters a similar first sound is given as in the word

كِتَابٌ .In the Phoneme grapheme correspondence task there are three practice trials, where feedback and modeling of successful answers are given, followed by the ten experimental trials where no feedback or modeling is given.

1. 1. *3.* ***Components of the test***[6]

- The two test booklets (test booklet A, and test booklet B) which were handed to each child (see Appendixes 5, 6) contain the same tasks but in a different order of the presented pictures in each item of the test.

- The test evaluation sheet (see Appendix) is a grid in which the students´ responses are recorded, including the names of the pictures in the sub items of the test with green color for the correct response cell, and a column for the recording of student's degree in every item. This provides a quick indicator for the individual strength and areas of weakness of each student.

- The handbook introduces the test administers with a guideline and a detailed description of the procedure how to implement the test with students, so that it does not require specific training - a careful reading of the administration guidelines will suffice.

- Transparencies for use on the over head to explain the practice trials to children.

1. 2. Test development

The development of the test passed through two main stages: the pilot form, and the second form. The following is a description of these two stages.

[6] Review Appendixes from (4 -8).

1. 2. 1. ***Pilot form:***

The first form included five sub-skills: Rhyme, Syllable segmentation**,** Syllable blending**,** First syllable identification, and Phoneme grapheme correspondence. In every sub-skill there were three practice trials, where feedback and modeling of successful answers were given, there then followed the ten experimental trials where no feedback or modeling was given. The child had to respond to it by placing a signal on the picture, which he or she considers to be the correct one of the three or four alternative pictures.

This pilot form has been applied to a sample of seven Egyptian children of families living in Germany, either as a permanent or temporary residence. Provided that the children can speak Arabic and Egyptian dialect, the goals of this application were:

- To determine the clarity of the test instructions for children.
- To determine the clarity of the test pictures for children.

As a result of this application it turned out that:

- Children did not show any response or reaction that would indicate an ambiguity or lack of understanding of the instructions.
- Some of the pictures of the test items needed modifications; this could be done by replacing of the original picture with similar pictures of the same one but better visible, or by replacing some pictures by others, or by exchanging the experimental trial item with another one. This way the difficulty of some test items was intended to be increased, where the researcher found that in the Syllables blending sub-test, the children guessed the word after the pronunciation of the first syllable. As a result, the additional words begin with the same or a similar syllable, make the item more difficult.
- Two forms of the test were required to prevent the transmission of the answers between students.

1. 2. 2. Revised form

The revised form developed as a consequence of the pilot form application and modification, and can be applied in groups. Many existing tests are applied individually which makes them impractical for a busy classroom teacher, because each test takes at least 15 minutes, and in some cases even longer. This factor alone means that few teachers are able to systematically assess the phonological awareness skills of all their students. Therefore there is a strong need for a class-wide test that quickly and easily screens children for phonological awareness. The test, in its revised form, includes the same five sub-skills after the modification.

1. 3. Test implementation

The goals of the test implementation were: determining the required for the test time, the norms, and then determine the children at risk. In order to achieve that, the following section will include information on: sample, administration, the test time, the answers' transition and evaluation of the individual tasks, determination of the risk points and the norms.

1. 3. 1. Sample

The early identification of children at risk in Egypt for reading difficulties is the first step to provide appropriate assistance for them to overcome their expected difficulties. Therefore, the sample of the current study includes first grade children at the beginning of their first semester. The sample consisted of 85 first graders (51 boys and 34 girls) of the time of the first application and only 80 children at the second application, due to the absence of 5 children. The age range was between 73 and 86 months which results in an average age of 78, 5 months. The subject children come from two different schools within the Alhalabia village school district of city Bani-suef. Both schools have similar environment and socio-

economic backgrounds. The students were asked to participate in the study on the basis of their self - desire to participate. After the permission of the school's management, the test was administered to children from both schools in the 4th quarter of the first semester of the school year. The first test applied was on 19th November 2008, and the second application took place on 15 December 2008.

1. 3. 2. ***Administration***

The test administrator was one of the Arabic language teachers who lived in the same village and who has the preliminary Master in Arabic language teaching methods. Taking into account that regular teachers, special education teachers, educational psychologists and speech language pathologists can successfully administer the test, it is a great advantage that the test does not require specific training - a careful reading of the hand book will suffice.

1. 3. 3. ***Test time***

As a result of the test application in groups of forty children, it was found that the test can be administered in 40 minutes. The scoring on the children's responses and filling in the evaluation sheet takes about seventy-five minutes for the answers of eighty five children. This means that it's an economical way to identify those children who need assistance; because it has the advantage of being a group survey procedure.

1. 3. 4. The answer's transition and evaluation of the individual tasks

After the test implementation, the responses of the children are evaluated. For the test booklets A and B different evaluation sheets were prepared. In essence, the child has to respond to each item by marking the appropriate box. Each table in the evaluation sheet includes boxes for correct answers

in green, making the evaluation of the solutions standardized. The score was recorded by giving one point for the correct response and 0 for the incorrect response, then the total value of the sum of correct answers was given; this is in the right column of each table.

1. 3. 5. Determining the risk points

If the child's value is less than 6, this means that the child's ability is still not sufficient, and if the child's value is less than 6 in more than two skills, this means that the child is at a risk point, so that she / he needs special intervention to support his/her learning to read.

2. Intervention phase (program design)

According to *Nicholson* (2004) there is an increasing consensus among researchers around the world that schools must include a strong phonological approach in the teaching of reading from the first days of schooling. There is converging evidence from many studies that children who experience difficulties in learning to read do not understand how to recode words phonologically, so that the important step after identifying children at risk is to design an intervention program to help the children with reading problems as early as possible. The following is a presentation of the current research intervention program; design procedures include:

- The foundations of a program design.
- The objectives of the intervention program.
- Program content and activities.
- Program teaching strategy.
- Materials.
- Program evaluation.

2. 1. The foundations of program design

- The phonological development depends on the acquisition by the child and on his/her language's native phonemic inventory.
- Some Arabic sounds are more difficult to perceive and produce by children than others.
- Syllables could be seen as the most important unit in the Arabic phonetic system, depending on the fact that there are close associations between consonants and vowels in the Arabic phonetic system.
- Taking into account the impact of diglossia (differences between MSA and SAV) in the phonemic inventories and the phonological composition.
- Taking into account the impact of the close correspondence between phonemes and graphemes, Arabic Transparent. This means that reading The Arabic script without short vowels can be a difficult task for poor and/or beginning readers.
- Children at risk for reading difficulties tend to have poor phonological awareness.
- Phonological awareness involves skills that can be represented by a continuum: rhyme, sentence and syllables.
- Instruction in phonological awareness should begin with easy tasks and move towards more difficult tasks.
- Instruction in phonological awareness should involve both analytic and synthetic activities.
- Instruction in phonological awareness should be fun for children.
- Small-group instruction is more effective in phonological awareness instruction than one-by-one and whole group instruction.
- The daily focus on phonological awareness activities will produce much more consistent growth than sporadic or irregular intervals of instruction.

- Pairing instruction in phonological skills with training in letter knowledge has a greater impact on the reading ability than does training in phonological skills alone.

2. 2. The objectives of the program

The program aims at developing children's capacity to

- Identify, discriminate and produce rhyme.
- Count, segment and blend the words of a sentence.
- Identify different types of first syllables in the word.
- Count the number of the syllables in a word.
- Blend the syllables in a word presented orally.
- Segment individual syllables in words.
- Name letters and produce their corresponding letter sounds.

2. 3. Program content and activities:

The recent remedial program includes instructions in the following core elements:

2. 3. 1. Rhyme: In a rhyme words sound the same in the final sound or sounds. Instruction in the recent program includes identifying, discriminating and producing the Rhyme using the following activities:

- Search for a similarity: In this game, the teacher shows a picture card to the pupils and pronounces its name then he shows two other picture cards and asks the pupils to identify which card is in accordance with the first card in Rhyme.

- Rhyme memory: In this game, the teacher gives each pupil three cards, and after determining a pupil who will start first, the child pulls a card from the following pupil to see if this card is in accordance with any other card in rhyme, then emerge the tow cards and say its names and put it in the middle of the table. And then the next pupil continues in the same way.

- Search for odd: In this game, the teacher shows three picture cards to the pupils, only two of these cards rhyme, the other one is different; the pupils have to discover the odd one.

- I see something you don't see: In this game, the teacher shows a picture card to the pupils and pronounces its name, and then he asks them to search for something that rhymes with this picture.

2. 3. 2. ***Sentences:*** instruction in the recent program includes counting, blending and segmenting words in sentences, using the following activities:

- To count words in a sentence, the game of jumping is used: In this game the teacher puts sheets on the ground on which figures from one to four are written. The teacher tells the pupils that he is going to say some sentences that have more than one word, and that they have to jump as they say each word of the sentence. Then they have to put the card on the appropriate number and say the number of the words in the sentence.
- Blend words using sentence-building game: In this game the teacher chooses two pupils; he gives the first one a sheet with the first word of the sentence and the second one another sheet with the second word of the sentence. He tells them that when he says the first word, the first

pupil stands up in the front right side of the class, and when he says the second word, the second pupil stands up in the front left side of the class. When he says the whole sentence, all the pupils join in and pronounce each word quickly.

- Blend words using hold and say game: In this game the teacher tells the pupils that he will say the words of a sentence separately, in the meantime, the teacher throws a small ball to a child who has to say the whole sentence and then has to return the ball to the teacher or, in case the pupil couldn't blend the words, has to throws it to the next pupil.
- Segment sentence into words using jumping game: In this game the teacher puts sheets on the ground written on each of it are figures from one to four. He tells the pupils that he will jump once for each word in the sentence, and puts the card on the appropriate number. Then he says the words in the sentence slowly with interval period between words.
- Segment sentence into words using the "say it and move it" game: In this game the teacher gives the pupils counters. While they are slowly articulating the sentence, for each word they have to push a counter into a box.

2. 3. 3. Syllables - are clusters of phonemes arranged around a vowel, or a word part that contains a vowel. Instruction in the recent program includes first syllable identification, counting syllables in a word, blending and segmenting syllables using the following activities:

2. 3. 3. 1 First syllable identification activities:

- Take care of your name: In this game the teacher articulates the first syllable of each pupil's name and the pupils guess the whole name.

- Search for a similar: In this task children are instructed in a very similar way as in the Rhyme identification game.
- Syllables memory: In this task children are instructed in a very similar way as in the Rhyme memory game.
- Search for the odd: In this task children are instructed in a very similar way as in the Rhyme discriminating game.

2. 3. 3. 2 count syllables in the word activities:

- Count syllables by clapping: the pupils are told that they have to clap once while the teacher says each syllable of the word.
- The chin-drop: the pupils are told that they have to hold their chin with their hands and count the number of chin drops, which present the number of the syllables in the word.
- Search for a similar: In this task children are instructed in a very similar way as in the Rhyme identification game.
- Syllables memory: In this task children are instructed in a very similar way as in the Rhyme memory game.

2. 3. 3. 3 syllables blending activities:

- What's in the bag game: the teacher says the word syllable-by-syllable and the children guess the word. A correct response is confirmed when the teacher pulls the object out of the bag.
- Blend syllables using hold and say game: In this task children are instructed in a very similar way as in the sentence blending.

2. 3. 3. 4 syllables segmenting activities:

- Segment word into syllables using jumping game: In this task children are instructed in a very way as in the sentence segment.
- Segment word into syllables using say it and move it game: In this task children are instructed in a very similar way as in the sentence segment.

- Segment word into syllables using Fingers: The pupils are told that each of them has to use his right hand fingers and then spread fingers one by one with each syllable.

2. 3. 4. ***Sound letter correspondence***: The relationship between phonemes and graphemes, instruction in the recent program includes identifying and discriminating letters´ sounds using the following activities:

- Letters car: The teacher shows the pupils the car of the letter which carries only the picture that starts with the sounds of the presented letter; the pupils have to search for these pictures.
- Let's pretend: the pupils are told that they have to pretend to go visit a place, and they are only allowed to take things or pictures which start with the sound of a determined letter.

2. 4. ***Program teaching strategy:***

Instruction in phonological awareness has two primary goals. The first objective is to help children notice the parts of words, to discover their existence and distinctness. The second goal is to help children make the "connection" between the sounds in words and the letters of the alphabet, providing explicit instruction in phonological awareness is critical to the early reading success, especially for at risk children.

When instruction is explicit, the words and the actions of the teacher are unambiguous, direct and visible, making clear what students have to do in order to learn, nothing is left to guess work. *(Abshire: 2006) (Texas Center for Reading and Language Arts and the Texas Education Agency: 2004)*

Based on the foregoing the present study adopts a strategy of explicit teaching, which is shown in the next stages:

- Introduce the activity: teacher introduces and explains the activity.
- Model explicit examples: Teacher provides guided practice.
- Provide students' opportunities: Students practice what the teacher modeled.
- Ongoing assessment and feedback: teacher provides prompts and feedback.

2. 5. Materials:[7]

Program materials include:

- Teacher's Guide: it introduces a guideline and a detailed description of the procedure to implement the program with pupils, so that it does not require specific training - a careful reading of the administration guidelines will suffice.
- Picture cards: they include a number of pictures sorted by the Arabic alphabet; so that each letter is represented by a number of pictures that include its sound.
- Counters: four counters for every pupil to use when segmenting the sentence into words, or words into syllables.
- Small ball: to use when blending words and syllables.
- Paper Ship: to use when learning letter sound correspondence.

[7] Review Appendixes from (9 -16)

2. 6. Program evaluation:

The program is evaluated through:

- Ongoing evaluation: the teacher provides feedback to the pupil's performance, which supports the pupil's strength, and modifies the pupil's weakness.
- Final evaluation: by using the diagnostic test.

3. The study questions

Based on the foregoing, study questions can be formulated as follows:

- Which phonological awareness skills are more difficult to acquire for the first grade pupils?

- Which phoneme grapheme correspondence skills are more difficult to acquire for the first grade pupils?

- Is there a relationship between phonological awareness and phoneme grapheme correspondence?

- Is the development of phonological awareness and phoneme grapheme correspondence a parallel one for the first and second measurement time points?

- What are the remedial program design procedures?

- Is the remedial program enough to satisfy the needs of children who are below average in phonological awareness and phoneme grapheme correspondence?

Chapter V: Test Characteristics

Research has added greatly to our understanding of the role of phonological awareness in learning to read. Assessment is critical in providing quality instruction that builds phonological awareness in both normally developing children and children who are at risk for learning to read. Assessment are available to (a) screen for students who might warrant specialized or additional services and resources related to the early reading skills, (b) determine what specialized services should be provided , and which specific phonological awareness skills should be taught, and (c) evaluate the effectiveness of instructional approaches by monitoring the process of individual children as they develop phonological awareness. Developing phonological awareness assessment tools and the appropriate use of it that match the purpose of assessment and have high technical quality are essential in meeting the most impotent goal of helping all children learn to read.
The recent chapter aims to demonstrate the Characteristics of the recent study diagnostic test, which include the following:

- Frequencies.
- Item Characteristics.
- Reliability.
- Validity.

Test Characteristics

Based on the theoretical considerations and with MÜSC and BISC instruments as examples, a similar instrument was developed to measure phonological awareness of children at the beginning of school consisting of 5 subscales for:

- Rhyme,
- Syllable Segmentation,
- Syllable Blending,

- First Syllable Identification and
- Sound-Letter Correspondence

The test was administered to 85 First-graders in Egypt 8 weeks after the beginning of their first school year and again to the same children (5 of whom were absent the second time) 3 to 4 weeks later. In addition, the teacher provided an evaluation of the pupil's achievement in reading after the first half year of school in form of grades.

1. Frequencies

An overview over **the frequency distribution** of the test scores (and the subtests) shows in general rather skewed distributions. This was to be expected, considering the fact that the testing took place eight weeks after the beginning of school when pupils had experienced some reading instruction already:

Table (5)

Frequency Distribution, Variance, Skewness and Kurtosis of Sub-scales

Scale **1st Measurement;**	N valid	 missing	mean	median	Standard- deviation	Skewness	Std-err of skewness	Kurtosis	Std.err. of Kurtosis	Variance
1. Rhyme	85	0	6,93	7,0000	2,389	-.445	,261	-.558	.517	5,709
1.Syllables segmentation	85	0	5,67	6,0000	3,259	-,183	,261	-1,201	,517	10,618
1.Syllables blending	85	0	6,78	7,0000	2,414	-,910	,261	,623	,517	5,828
1.First syllable identification	85	0	6,76	8,0000	2,408	-1,062	,261	,532	,517	5,797
1.Sound letter correspondence	85	0	5,96	6,0000	2,758	-,214	,261	-,727	,517	7,606
2nd Measurement;										
2. Rhyme	80	5	7,78	7,0000	1,889	-1.8040	.269	4.183	.532	3,569
2.Syllables segmentation	80	5	6,05	7,0000	3,424	-,377	,269	-1,262	,532	11,722
2.Syllables blending	80	5	8,20	9,0000	1,765	-1,694	,269	4,752	,532	3,116
2.First syllable identification	80	5	7,75	8,0000	1,782	-1,928	,269	5,633	,532	3,175
2.Sound letter correspondence	80	5	6,40	7,0000	3,208	-,533	,269	-,818	,532	10,294
First total test value	85	0	32,1412	33,0000	9,827	-,451	,261	-,657	,517	96,575
Second total test value	80	5	36,0500	38,0000	9,0256	-1,228	,269	1,972	,532	81,466

The skewness increases from first to second testing due to the influence of further exposure to reading instruction, which is visible also in the follow following figures :

Figures 1: Frequency Distribution, of Sub-scales

Figure 1a and 1b: Sub-scale Rhyme 1st and 2nd Testing

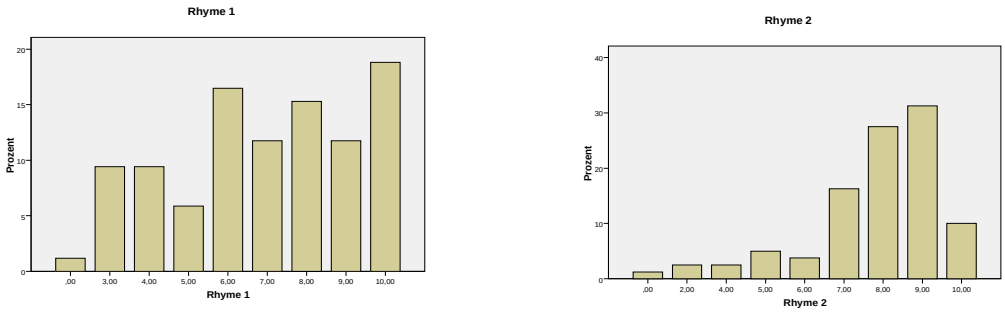


Figure 1c and 1d: Sub-scale Syllable Segmentation 1st and 2nd Testing

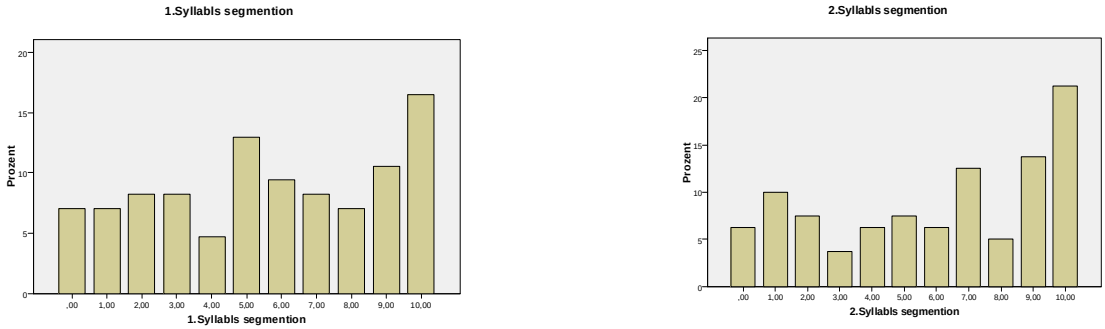


Figure 1e and 1f: Sub-scale Syllables Blending 1st and 2nd Testing

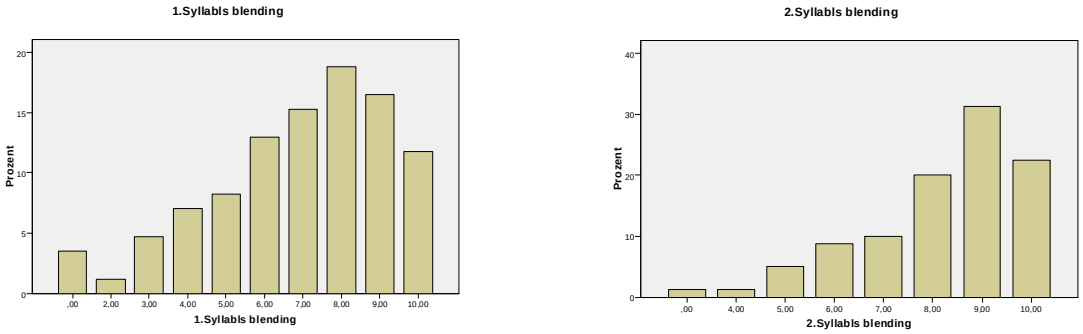


Figure 1g and 1h: Sub-scale 1st Syllables Identification 1st and 2nd Testing

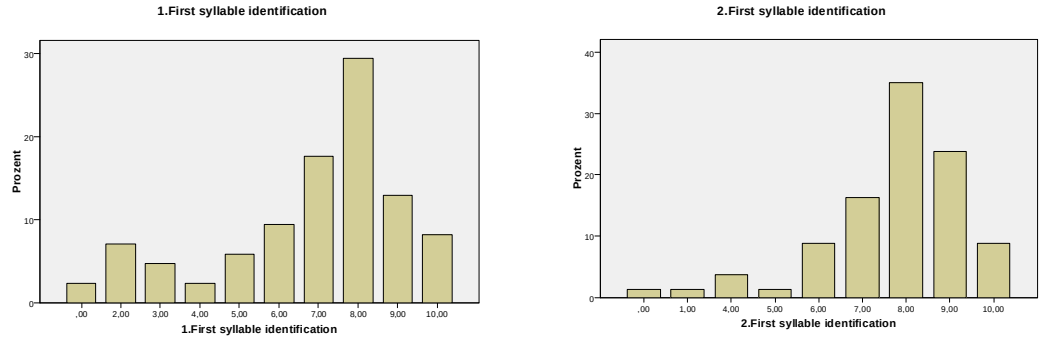


Figure 1i and 1j: Sub-scale Sound-Letter Correspondence 1st and 2nd Testing

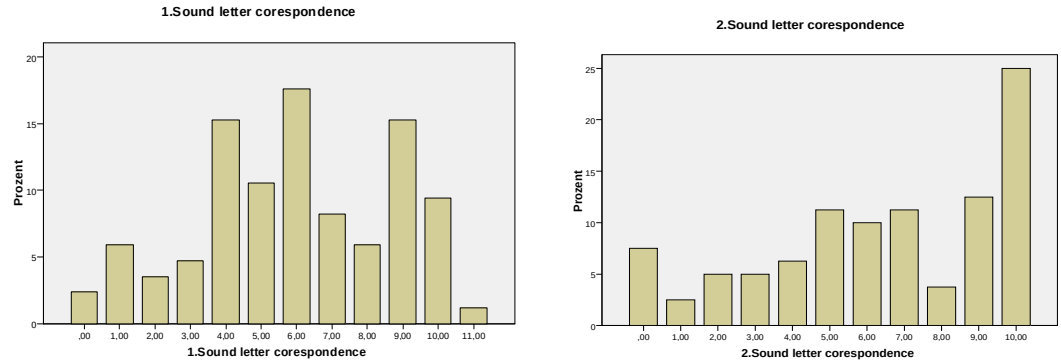
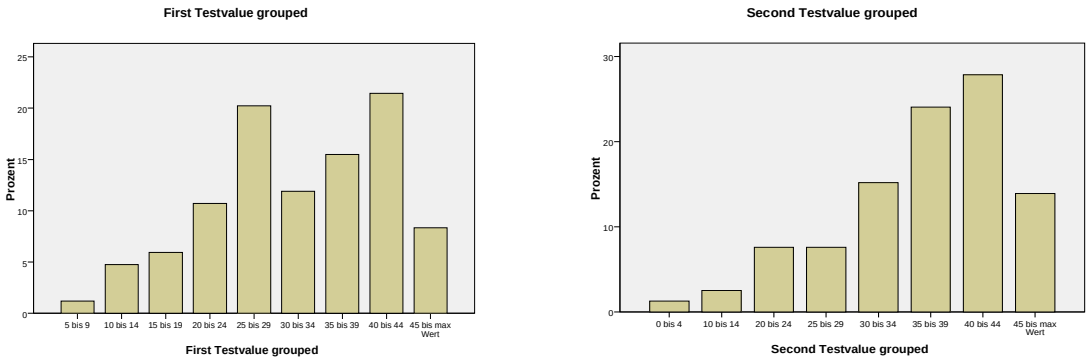


Figure 1k and 1l: Frequency Distribution of Total Test Scores for 1st and 2nd Testing



2. ***Item Characteristics***

The tables of the different subtests and the corresponding figures below show that the subtests and the individual items are not very difficult – es-

pecially not at the later measurement point with a difficulty index (*Schwierigkeitsindex)* between .4 and 1.0 while the discrimination index (*Trennschaerfe*) varies comfortably between +.1 and +.8 . For any future revision, items with a difficulty nearly 1.0 and/or discrimination below .1 might be omitted from the test.

Table (6a)

: Reliability and Item-Scale Statistics for Subscale: Rhyme (1st testing)

Cronbachs Alpha	Number of Items
,719	10

Item-Scale-Statistics

	Mean of scale if item is omitted	Variance of scale it item is omitted	corrected Item-Scale-correlation	Cronbach's Alpha, if item is omitted
R1_1	6,07	5,162	,267	,713
R2_1	6,11	4,905	,387	,697
R3_1	6,21	4,693	,414	,691
R4_1	6,52	4,657	,378	,698
R5_1	6,20	4,757	,386	,696
R6_1	6,28	4,419	,524	,671
R7_1	6,19	4,726	,412	,692
R8_1	6,29	4,520	,464	,682
R9_1	6,20	5,186	,159	,732
R10_1	6,29	4,662	,388	,696

Table (6b):

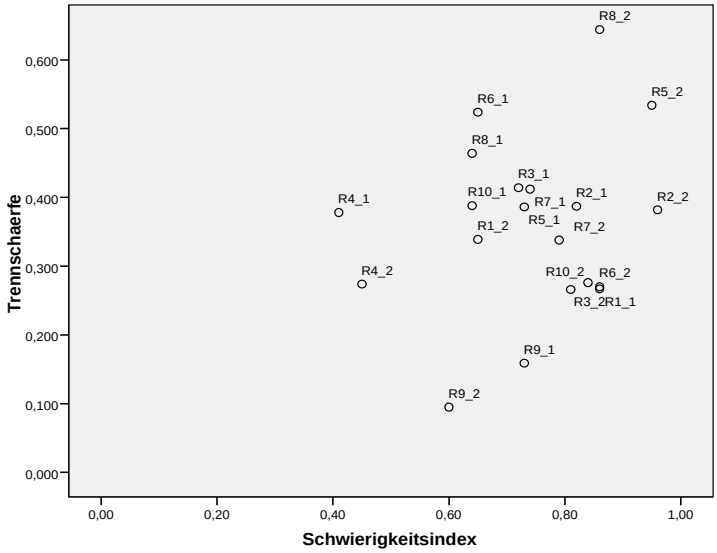
Reliability and Item-Scale Statistics for Subscale: Rhyme (2nd testing)

Cronbachs Alpha	Number of Items
,641	10

Item-Scale-Statistics

	Mean of scale if item is omitted	Variance of scale it item is omitted	corrected Item-Scale-correlation	Cronbach's Alpha, if item is omitted
R1_1	7,13	2,794	,339	,610
R2_1	6,81	3,268	,382	,618
R3_1	6,96	3,049	,266	,625
R4_1	7,33	2,855	,274	,629
R5_1	6,83	3,108	,534	,596
R6_1	6,91	3,119	,270	,623
R7_1	6,99	2,924	,338	,609
R8_1	6,91	2,714	,644	,549
R9_1	7,18	3,159	**,095**	,674
R10_1	6,94	3,072	,276	,622

Figure 2: *Scatter diagram of bivariate distribution of difficulty discrimination index for the 10 items of the subscale Rhyme*



(Table 7a):

Reliability and Item-Scale Statistics for Subscale: Syllable Segmentation (1st testing)

Cronbachs Alpha	Number of Items
,866	10

Item-Scale-Statistics

	Mean of scale if item is omitted	Variance of scale it item is omitted	corrected Item-Scale-correlation	Cronbach's Alpha, if item is omitted
Sgm1_1	4,95	9,688	,252	,878
Sgm2_1	4,89	9,548	,340	,871
Sgm3_1	5,29	8,877	,513	,859
Sgm4_1	5,07	8,257	,743	,840
Sgm5_1	5,21	8,597	,597	,852
Sgm6_1	5,07	8,638	,595	,852
Sgm7_1	5,05	8,307	,733	,841
Sgm8_1	5,18	8,409	,666	,846
Sgm9_1	5,07	8,400	,687	,845
Sgm10_1	5,25	8,450	,660	,847

(Table 7b):

Reliability and Item-Scale Statistics for Subscale: Syllable Segmentation (2nd testing)

Cronbachs Alpha	Number of Items
,885	10

Item-Scale-Statistics

	Mean of scale if item is omitted	Variance of scale it item is omitted	corrected Item-Scale-correlation	Cronbach's Alpha, if item is omitted
Sgm1_2	5,45	10,073	,400	,890
Sgm2_2	5,26	9,816	,613	,875
Sgm3_2	5,44	9,566	,581	,877
Sgm4_2	5,39	9,126	,770	,863
Sgm5_2	5,55	9,339	,642	,872
Sgm6_2	5,58	9,488	,590	,876
Sgm7_2	5,49	9,595	,557	,878
Sgm8_2	5,44	9,262	,692	,869
Sgm9_2	5,45	9,365	,649	,872
Sgm10_2	5,41	9,258	,705	,868

Figure 3: *Scatter diagram of bivariate distribution of difficulty discrimination index for the 10 items of the subscale Syllable Segmentation*

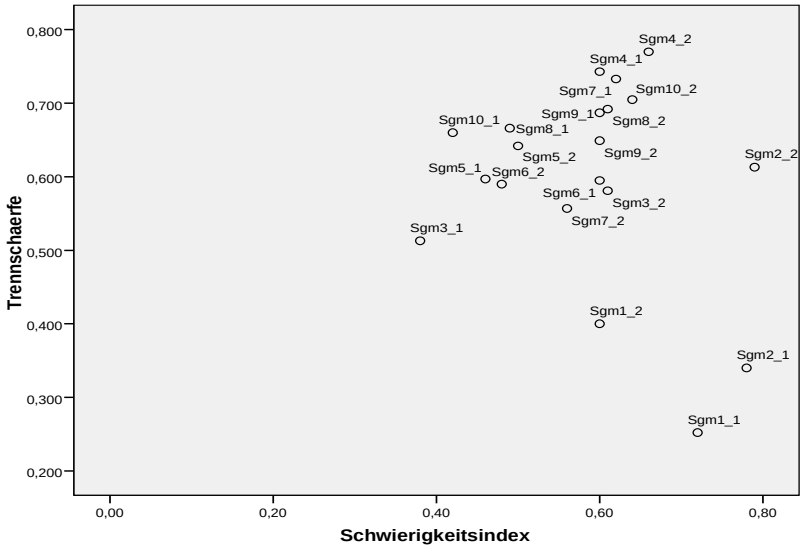


Table (8a):
Reliability and Item-Scale Statistics for Subscale: Syllables Blending
(1st testing)

Cronbachs Alpha	Number of Items
,742	10

Item-Scale-Statistics

	Mean of scale if item is omitted	Variance of scale it item is omitted	corrected Item-Scale-correlation	Cronbach's Alpha, if item is omitted
B1_1	5,94	5,342	,403	,722
B2_1	5,95	5,045	,571	,700
B3_1	6,22	4,914	,456	,713
B4_1	6,05	5,117	,425	,718
B5_1	5,93	5,352	,413	,721
B6_1	6,06	5,223	,361	,727
B7_1	6,16	4,925	,464	,711
B8_1	6,15	5,226	,319	,735
B9_1	6,31	5,262	,287	,740
B10_1	6,21	5,050	,391	,723

Table (8b):
Reliability and Item-Scale Statistics for Subscale: Syllables Blending
(2nd testing)

Cronbachs Alpha	Number of Items
,664	10

Item-Scale-Statistics

	Mean of scale if item is omitted	Variance of scale it item is omitted	corrected Item-Scale-correlation	Cronbach's Alpha, if item is omitted
B1_2	7,28	2,632	,461	,622
B2_2	7,26	2,728	,387	,635
B3_2	7,63	2,212	,432	,616
B4_2	7,34	2,530	,407	,624
B5_2	7,25	2,797	,345	,643
B6_2	7,26	2,880	,193	,661
B7_2	7,39	2,367	,478	,605
B8_2	7,26	2,804	,289	,648
B9_2	7,71	2,537	,193	,684
B10_2	7,43	2,551	,276	,653

Figure 4: *Scatter diagram of bivariate distribution of difficulty discrimination index for the 10 items of the subscale Syllables Blending*

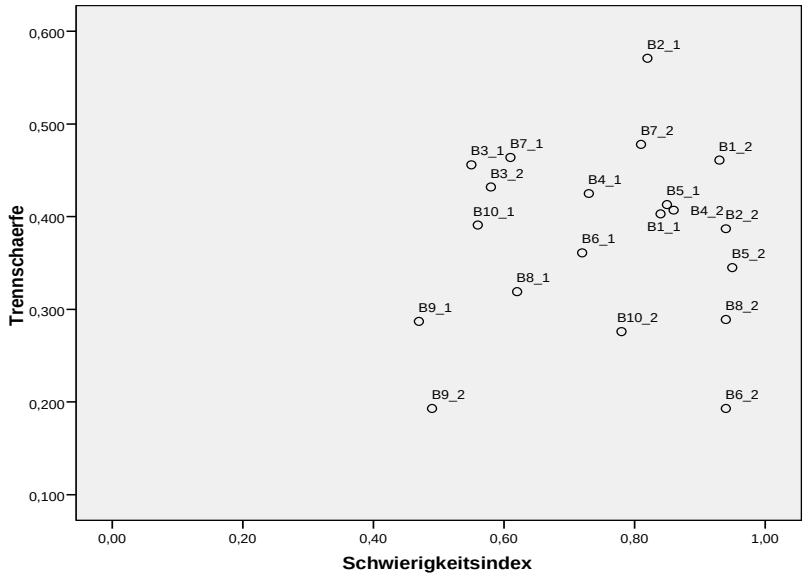


Table (9a):
Reliability and Item-Scale Statistics for subscale: 1st syllable identification (1st testing)

Cronbachs Alpha	Number of Items
,781	10

Item-Scale-Statistics

	Mean of scale if item is omitted	Variance of scale it item is omitted	corrected Item-Scale-correlation	Cronbach's Alpha, if item is omitted
Id1_1	5,98	5,590	,365	,772
Id2_1	5,93	5,392	,540	,753
Id3_1	6,20	5,200	,450	,763
Id4_1	5,96	5,071	,680	,734
Id5_1	5,98	5,132	,626	,740
Id6_1	6,04	5,529	,352	,774
Id7_1	6,02	5,325	,467	,760
Id8_1	6,37	5,489	,323	,780
Id9_1	5,96	5,360	,507	,755
Id10_1	6,42	5,619	,275	,786

Table (9b):
Reliability and Item-Scale Statistics for subscale: 1st syllable identification (2nd testing)

Cronbachs Alpha	Number of Items
,635	10

Item-Scale-Statistics

	Mean of scale if item is omitted	Variance of scale it item is omitted	corrected Item-Scale-correlation	Cronbach's Alpha, if item is omitted
Id1_2	6,85	2,686	,455	,584
Id2_2	6,80	2,820	,488	,593
Id3_2	6,91	2,562	,444	,578
Id4_2	6,81	2,686	,604	,571
Id5_2	6,83	2,880	,308	,612
Id6_2	6,89	2,481	,574	,552
Id7_2	7,19	2,711	,163	,655
Id8_2	7,25	2,772	,121	,667
Id9_2	6,88	2,845	,242	,622
Id10_2	7,35	2,762	,136	,661

Figure 5: *Scatter diagram of bivariate distribution of difficulty discrimination index for he 10 items of the subscale 1st Syllable Identification*

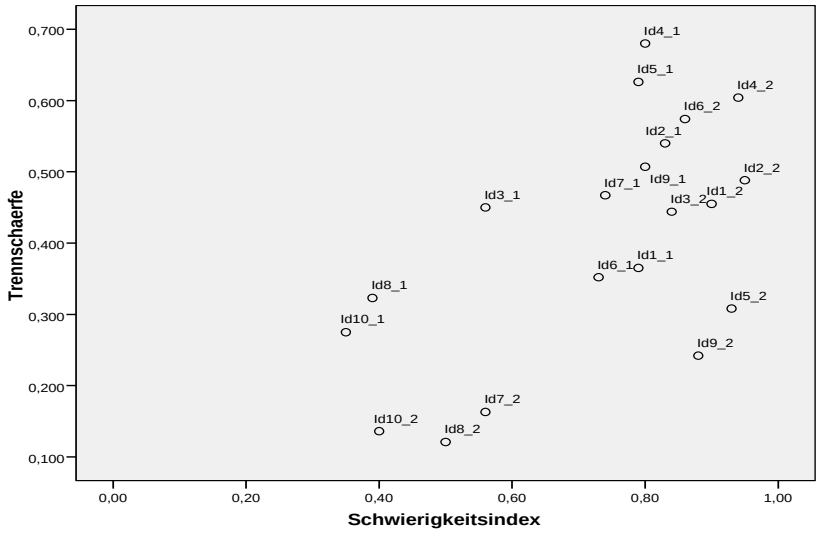


Table (10a):
Reliability and Item-Scale Statistics for subscale: sound-letter-correspondence (1st testing)

Cronbachs Alpha	Number of Items
,775	10

Item-Scale-Statistics

	Mean of scale if item is omitted	Variance of scale it item is omitted	corrected Item-Scale-correlation	Cronbach's Alpha, if item is omitted
Cor1_1	5,21	6,407	,493	,750
Cor2_1	5,34	6,608	,344	,769
Cor3_1	5,49	6,182	,519	,746
Cor4_1	5,36	6,163	,532	,744
Cor5_1	5,46	6,466	,393	,763
Cor6_1	5,25	6,474	,438	,757
Cor7_1	5,31	6,929	,219	,784
Cor8_1	5,24	6,230	,561	,741
Cor9_1	5,31	6,453	,421	,759
Cor10_1	5,51	6,205	,511	,747

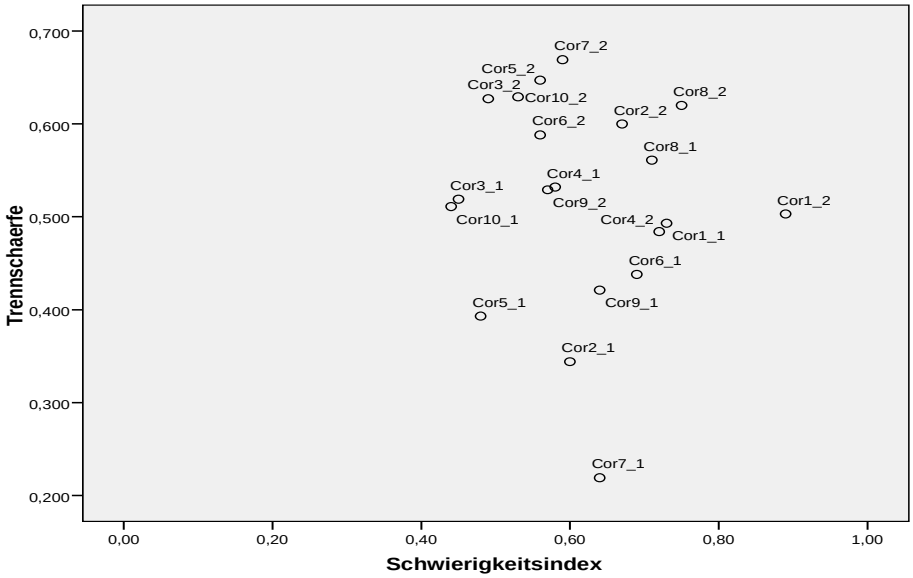
Table (10b):
Reliability and Item-Scale Statistics for subscale: sound-letter-correspondence (2nd testing)

Cronbachs Alpha	Number of Items
,871	3

Item-Scale-Statistics

	Mean of scale if item is omitted	Variance of scale it item is omitted	corrected Item-Scale-correlation	Cronbach's Alpha, if item is omitted
Cor1_2	5,44	9,173	,503	,865
Cor2_2	5,66	8,382	,600	,857
Cor3_2	5,84	8,191	,627	,855
Cor4_2	5,61	8,754	,484	,866
Cor5_2	5,77	8,153	,647	,853
Cor6_2	5,77	8,306	,588	,858
Cor7_2	5,73	8,121	,669	,851
Cor8_2	5,58	8,477	,620	,856
Cor9_2	5,76	8,467	,529	,863
Cor10_2	5,80	8,189	,629	,855

Figure 6: *Scatter diagram of bivariate distribution of difficulty discrimination index*



for the 10 items of the subscale sound-letter-correspondence

In general, the items show a good consistency and only in a few instances would the omission of an item lead to a small increase in Cronbach's alpha. The increase, however, is in no instance large enough to warrant the exclusion of an item.

3. Reliability

Based on these data, in a first step, the consistencies of the different subscales were tested with Cronbach's alpha separated for the first and the second testing.

The analysis of the first testing was based on data from 85 pupils, the second testing on 80 pupils, giving a Cronbach's alpha of medium height. (See table 7)

Table (11):

Cronbach's alpha for five subtests on 1st and 2nd testing

		1st Testing	2nd Testing
	No of Items	**Cronbach's α**	**Cronbach's α**
Rhyme	10	.719	.641
Syllable Segmentation	10	.866	.885
Syllables Blending	10	.742	.664
1stSyllable identification	10	.781	.645
Sound-Letter Correspondence	10	.775	.871

Considering that the subtests consist of a limited number of items (10) and there were only 85 resp. 80 measurements available, the reliability scores are sufficiently high for a test used by teachers.

Looking at the item-scale correlation, all scales, with a few exceptions, consisted of items with high intercorrelations. Only in the subtest Rhyme is the ninth item at both testing occasions (R9_1 and R9_2) only marginally correlated with the subscale value. An omission of this item would increase Cronbach's α from .719 to .732 and from .641 to .674 respectively. The item distinguishes only slightly between "good" and "not good" performers at both measurement times. It might measure something else – or the words chosen in the test are not adequate (too easy or too difficult) to test the ability.

In a second step, the correlation between the five subscales and their relation with the evaluation of pupil's achievement by the teacher was determined. All subscales correlate highly with the total test score (between .66 and .82) as was expected, while the intercorrelation between the different subtests was significant ($\alpha < 0{,}01$) between .40 and .64 at the first testing and between .29 and .50 during the second testing (see table 8).

Table (12):

Nonparametric Correlations for 1st and 2nd testing (1st testing above diagonal, 2nd testing below diagonal in correlation matrix)

			1st testing						
			Teachers Evaluation	Rhyme	Syllables segmenta-tion	Syllables blending	1st syllable identifica-tion	Sound letter corresp.	First Testscore
Spear-man-Rho	Teachers Evaluation	Coeff. corr.		,302(**)	,082	,295(**)	,318(**)	,322(**)	,352(**)
	Rhyme	Coeff. corr.	,345(**)		,237(*)	,575(**)	,520(**)	,515(**)	,700 (**)
	Syllables segmenta-tion	Coeff. corr.	,118	,318(**),		,395(**)	,407(**)	,271(*)	,648 (**)
	Syllables blending	Coeff. corr.	,209	,407 (**)	,291 (**)		,500(**)	,643(**)	,794 (**)
	First syllable identifi-cation	Coeff. corr.	.127	,391 (**)	,228 (*)	,151		,533(**)	,786 (**)
	Sound letter corre-spondence	Coeff. corr.	,352(**)	,449 (**)	,383 (**)	,498 (**)	,355 (**)		,763(**)
	Second Testscore (sum)	Coeff. corr.	,327(**)	,617 (**)	,729(**)	,622 (**)	,523 (**)	,825 (**)	

** very significant (α≤ 0.01)
* significant (α≤ 0.05)
a list-wise N= 85

The correlations are strongest between sound-letter correspondence and syllables blending at both testing times (.64 resp. .50) While the originally strong relationship between syllable blending and 1st syllable identification (.50) practically disappears at the second testing (.15)

The items in the sound-letter-correspondence subscale can be further sub-divided according to the sounds involved. The following table shows the percentage of correct answers to items in the subtest “sound-letter-correspondence” with the sound Liquid” represented by item 1; Fricative represented by the average of the sum of items 2, 4, 9 and 10; Nasal by item 3; Plosive represented by the average of the sum of items 5, 7 and 8, and Trill by item 6.

With the exception of Trill, the pupils show an improvement from test 1 to test 2 in all other sounds. This is in the accordance with the expectations.

Table (13):
Correlations of sub-tests of sound-letter-correspondence with total test score for 1st and 2nd testing

Correlation of sounds with test	Test 1	Test 2
	mean	**mean**
Liquid	.73	.89
Fricative	.57	.62
Nasal	.45	.49
Plosive	.61	.63
Trill	.69	.56

3. Validity

The validity of this test can be determined by different means. One indicator for the validity of the instrument is the correlation between the results of the test and the teacher evaluation of the over-all achievement of the pupils since the test should predict the achievement of pupils in reading. The teacher evaluation was collected at the time of the first testing. A higher correlation should be expected with the results from the first testing since the reduction in variance at the time of the second testing necessarily reduces the correlation value :

Table (14):

Correlations of sub-tests of phonological awareness at first and second testing with teacher evaluation of pupils achievement.

	Test 1 with Teachers Evaluation	Test 2 with Teachers Evaluation
Rhyme_1	.329(**)	.245(*)
Syllables segmention	.084	.116
Syllables blending	.316(**)	.138
First syllable identification	.351(**)	.126
Sound letter correspondence	.333(**)	.326(**)
Total test	.369(**)	.263(*)

** very significant (α≤ 0.01)

There is a moderate correlation (between .3 and .4) between the teachers evaluation and the subtests of the first testing with the exception of the subtest on syllables segmentation which has no significant correlation (.084) while at the second testing only the subtest for sound-letter-correspondence – being at the center of the reading process - still shows a very significant correlation with teacher evaluation. Therefore, one can conclude that the test has some predictive validity for reading achievement.

Another indication of the validity of the instrument could be the difference between boys and girls with respect to aspects of phonological awareness There is a great wealth of information supporting the assumption that the language development of boys is slower than for girls. As can be seen in the following table, this assumption holds true for the full test, however only for the subtests rhyme and syllables blending. The other differences point in the expected direction, however not significant

Table (15):
Means of boys and girls in sub-tests and total test score for 1st and 2nd testing

subtest	boys mean	girls mean	significance (t-test)
Rhyme 1	6.42	7.97	ss
Rhyme 2	7.36	8.36	s
syll.segm.1	5.59	5.79	ns
syll.segm.2	5.66	6.61	ns
syll. blending 1	6.12	7.76	ss
syll. blending 2	7.72	8.88	ss
1st syll ident 1	6.50	7.15	ns
1st syll ident 2	7.36	8.30	s
Sound-letter-corr 1	5.47	6.66	
Sound-letter-corr 2	6.06	6.77	
total test 1	29.92	35.32	s
total test 2	34.15	39.31	ss

A readiness-test, as the one under discussion, should be responsive to development and learning so we may expect an improvement (gain in test score) due to learning.

The following table shows the steady gain between first and second testing with a medium correlation between the two testing times. The correlation between the result during the first testing and the gain-score for the second testing exhibits the expected negative correlation for a test of basic skills: Those with lower scores at first testing gain more than those with higher scores, which is due to the intended ceiling-effect of the test:

Table (16):
Means and correlations of sub-tests for 1st with 2nd testing and with the gain from 1st to 2nd testing

Subtest	mean 1st test	mean 2nd test	gain	corr $_{t1-t2}$	corr $_{test1-gain}$
Rhyme	7.04	7.76	.72	+.50	- .65
Syllable segmentation	5.62	6.00	.38	+.50	- .55
Syllables Blending	6,87	8.19	1.32	+.44	- .70
1st Syllable identification	6.81	7.70	. 89	+.32	- .74
Sound-Letter correspondence	5.96	6.40	.46	+.53	- .53
Total	**3**2.14	36.05	3.91		

These results indicate that the test actually measures competencies which improve with instruction giving so a further indication of the validity of the instrument.

Chapter V1: Results and Discussion

Assessment tools serve many purposes, one of which is to facilitate intervention. Based on; among many language systems, it was documented that intervention on various phonological awareness skills can improve such skills. The following is a presentation of the results of the implementation of the diagnostic test these results may be utilized for the development of an effective treatment program. The following questions shall direct the communication of such a program.

2. Research Questions results :

- ***Which phonological awareness skills are more difficult to acquire for the first grade pupils****?*

The next 2 tables show the answer of the first question

Table (17)

Mean, Standard deviation, Variance of phonological awareness sub-scale

Scale **1st Measurement;**	mean	Stan-dardde-viation	Variance
1. Rhyme	7.04	2.389	5.709
1.Syllables segmen-tation	5.67	3.259	10.618
1.Syllables blending	6.78	2.414	5.828
1.First syllable identi-fication	6.76	2,.08	5.797
2nd Measurement;			
2. Rhyme	7.78	1.889	3.569
2.Syllables segmen-tation	6.05	3.424	11.722
2.Syllables blending	8.20	1.765	3.116
2.First syllable identi-fication	7.75	1.782	3.175

Table 1(18)

Mean, and gain of phonological awareness sub-scale

Subtest	**mean 1st test**	**mean 2nd test**	**gain**
Rhyme	7.04	7.76	.72
Syllable Segmentation	5.62	6.00	.38
Syllables Blending	6.87	8.19	1.32
1st Syllable Identification	6.81	7.70	. 89

Based on the means, we might conclude that the rhyme task is considered the easiest phonological awareness task (with mean, 7.04 - 7.76 and gain average .72); whereas syllables segmentation is more difficult than the other skills (with mean, 5.62- 6.00 and average gain. 38). These results are consistent with *Lane*; *et al, (2002) Division for Learning Disabilities (DLD) (2004) Troia; et al, (1998) Yopp (1988) Torgesen; and Mathes (2002)* . The difficulty might be just an expression of the difficulty of the items chosen. However, looking at the low gain scores, it becomes obvious that syllable segmentation is more difficult to learn than the other skills. Therefore, the mean differences indicate differences in learning difficulty not related to the item characteristics alone. The response format is another issue worthy of consideration. In some tasks, children respond verbally to queries or prompts by the examiner, whereas, in other task, student tape out the number of syllables they hear in response to syllables segmentation. Student's unfamiliarity with the task requirements might contribute to poor performance. Another factor that may influence student performance is the response type. Specifically, students are required to recognize something (e.g. Do these two words rhyme?) or to produce a response. In general, recognition tasks typically are easier than production tasks. Finally, analysis tasks appear to be more demanding than synthesis tasks, because the ability to segment develops later and is more difficult to learn.

Which phoneme grapheme correspondence skills are more difficult to acquire for the first grade pupils?

The next table shows the answer of the second question

Table (19)

Mean Standard-deviation, Skewness, and Kurtosis of phoneme grapheme correspondence sub-scale

	Num-ber of items	mean	median	Standard-deviation	Skewness	Kurtosis	Variance
Liquid1	1	.73	1.00	.447	.200	.261	.517
Liquid2	1	.89	1.00	.320	.102	.271	.535
Nasal1	1	.45	.00	.500	.250	.261	.517
Nasal2	1	.49	.00	.503	.253	.271	.535
Trill1	1	.69	1.00	.464	.215	.261	.517
Trill2	1	.56	1.00	.500	.250	.271	.535
Fricative1	4	.56	.50	.353	.125	.261	.517
Fricative2	4	.62	.75	.346	.120	.271	.535
Plosive1	3	.61	.67	.326	.106	.261	.517
Plosive2	3	.63	.67	.391	.153	.271	.535

Based on the means, and taking into account that some of tasks are represented by one item only (liquid, nasal, and trill) while some are represented by a number of items (fricative, and plosive) we might conclude that the "liquid" task is considered the easiest phoneme-grapheme correspondence task (with mean .73 - .89); These results are consistent with *McBride (1995),w*hereas "nasal" is more difficult than the other skills for both tasks (with mean .45 - .49) followed by fricative (with mean .56 - .62) and plosive (with mean .61 - .63).

The difficulty to map letter graphemes to their corresponding phonemes for these consonants might be due to student unfamiliarity with the letter *(n)* which is usually introduced at the end of the teaching of alphabet letters to children in Egypt. Regarding the difficulty of fricative and plosive sounds-letters correspondence, we might conclude that the sounds representing the items are emphatic (/d/, /ð/) which can be interpreted in the light of Arabic diglossia, that these consonants have dialectal variants cou-

pled, with the fact that the pupils who belonged to different dialects tend to favor dialects spoken in the family, more than high level Arabic, which has been sporadically leading to children's difficulties to map letter graphemes to their corresponding phonemes.

- ***Is there a relationship between phonological awareness and grapheme correspondence?***

The answer of the question can be explained with the next table

Table (20)

Correlation of phonological awareness and phoneme- grapheme correspondence, 1st testing (above diagonal) and 2nd testing (below diagonal)

			Teachers Evaluation	Rhyme	Syllables segmentation	Syllables blending	First syllable identification	Sound letter correspondence	First Testscore
Spearman-Rho	Teachers Evaluation	Coeff. corr.		,302(**)	,082	,295(**)	,318(**)	,322(**)	,352(**)
	Rhyme	Coeff. corr.	,345(**)		,237(*)	,575(**)	,520(**)	,515(**)	,700 (**)
	Syllables segmentation	Coeff. corr.	,118	,318(**),		,395(**)	,407(**)	,271(*)	,648 (**)
	Syllables blending	Coeff. corr.	,209	,407 (**)	,291 (**)		,500(**)	,643(**)	,794 (**)
	First syllable identification	Coeff. corr.	.127	,391 (**)	,228 (*)	,151		,533(**)	,786 (**)
	Sound letter correspondence	Coeff. corr.	,352(**)	,449 (**)	,383 (**)	,498 (**)	,355 (**)		,763(**)
	Second Testscore (sum)	Coeff. corr.	,327(**)	,617 (**)	,729(**)	,622 (**)	,523 (**)	,825 (**)	

As can be seen in the intercorrelations in the table above, there is a relationship between phonological awareness and phoneme- grapheme correspondence. At the first testing, the correlation is between, 0.35 for first syllable identification and, 0.5 for syllables blending, This means that letter knowledge was most closely associated with syllables blending, and less closely associated with first syllable identification. The correlation, however, decreases from T1 to T2 in all subtests with the exception of first syllable identification, where the correlation increases from, 0.35 to, 0.52. All in all we can conclude that there is a clear relationship between phonological awareness and phoneme-grapheme correspondence. This result is in

line with previous work showing the relation between the two skills *Mauer and Kamhi (1996) Carroll (2004) Treiman; et al, (1993)*

Based on foregoing it could be argued that there is a kind of inter-relationship between letter-sound knowledge, and phonological awareness. This is called the "phonological linkage hypothesis," which assumes that training in phonological skills in isolation from reading and spelling skills may be much less effective than training that forms explicit links between children's underlying phonological skills and their experiences in learning to read and spell

The close association between letter knowledge and syllables blending may be interpreted as an indicator for the fundamental role of syllables blending as a precursor for learning to read. Learning to read and write involves learning the mappings between units in spoken words and units in printed words.

2. Discussion

The aim of the present study was to develop an intervention program for early identification and remediation of phonological awareness and phoneme-grapheme correspondence. In order to achieve this goal the current study has designed a diagnostic test “the early diagnosis test for dyslexia (phonological awareness, and phoneme grapheme correspondence)”. The test was applied in two time points with a sample of 85 Egyptian first grade children. Our discussion will focus on the following:

- The final version of the test.
- Educational implications.
- What is the next?
- Recommendations for further research.

- ***The final version of the test.***

The final version included five sub-scales: Rhyme, Syllables segmentation**,** Syllables blending**,** First syllable identification, and Phoneme grapheme correspondence. In every sub-scale there were three practice trials, where feedback and modeling of successful answers were given, then followed by ten experimental trials where no feedback or modeling was given, and the child has to respond by ticking the picture, which he or she thinks to be correct among the three or four alternative pictures. This final version includes:

1- Two test booklets (test booklet A, and test booklet B) which were handed to each child different only by the order of the pictures presented in each item.

2- Test evaluation sheet (see Appendix) in which the students´ responses are recorded, providing a quick indicator for the individual strength and area of weakness of each student. This includes the names of the pictures in the subscales of the test with green color for the correct response cell, and a column for the recording of student's degree in every item.

3- Handbook with a guideline for the test administrator and a detailed description of the procedure how to introduce the test to the students,

4- Transparencies which use by the over head to explain the practice trials to children.

In general we can say that the test is easy to apply and, providing teachers with instruments which enable them to find out whether the child is expected to be at risk for reading problems. Moreover, group administration helps teacher Spare their time and effort.

Educational implications.

Results from the present investigation suggest a number of areas any remedial program in Arabic language should pay attention to:

- As the findings of the study indicate, syllables segmentation and phoneme-grapheme correspondence is more difficult than the other skills; therefore intervention programs should focus on these two skills more than other skills.

- Considering phoneme-grapheme correspondence, the results of the study suggests that the impact of Arabic diglossia in teaching phoneme-grapheme correspondence must be taken into consideration when an intervention program focuses on emphatic consonants, which have no dialectal variants coupled.

- Finally, any intervention program has to combine tasks of phonological awareness as precursor to phoneme-grapheme correspondence with knowledge of alphabetic principle and phonetic decoding skills.

- ***What is next?***

So far, our analysis of the diagnostic test has provided a number of guides to verify the effectiveness of an interventions program, in the present study the program has only been outlined and not tested by experiment. An interventions program designed for the Egyptian first grade children, and eventually for Arabic first-grade children in general, requires a program implementation in Egypt this has not been possible so far for the researcher. To improve both the identification and the treatment of children

at risk in Egypt will be the next step in a long research and development process.

Intervention program experiment

An experimental phase is required to verify the effectiveness of the program in the early treatment of children at risk for reading problems. As the proportion of at risk children is ranging between 15 to 20 percent of the first grade children in Egypt, and the schools in Egypt usually contain two or three first grade classes with an average number of about 40 children in each class, this means that in a school with two classes there are approximately 14 children at risk in each school. In order to obtain a representative sample of such children, it would be preferable to choose at least five schools, so that it is possible to divide the children at risk for reading problems in each school into two groups, an experimental group and a control group. Both groups shall take part in the same pretest for an early diagnosis test for dyslexia (phonological awareness and phoneme grapheme correspondence). The teaching of the experimental group will be based on the intervention program (for early phonological awareness and phoneme grapheme correspondence treatment) for 13 weeks. Whereas the control group shall be taught in the normal classroom; after 13 weeks the same test will be repeated as a post-test to both groups to determine the effectiveness of the intervention program.

Program teaching time frame

There is plenty of literature indicating that children with poor phonological skills when entering school benefit from instruction programs that target these skills. This benefit will be greater when the instruction is imple-

mented as early as possible in the first grade, before the child develops any reading problems. Therefore the proposed intervention program is designed to be implemented in the beginning of the third or fourth week of the first grade, after the children at risk are identified with help of the early diagnosis test for dyslexia (phonological awareness and phoneme grapheme correspondence). According to the research daily focus activities shall produce much more consistent improvement than sporadic involvement or casual instruction that occurs at irregular intervals. The intervention program proposed consists of 65 teaching units; each unit to be exercised for 15-20 minutes every day, five units per week, so that the program will take approximately 13 weeks. These instruction units for children at risk could be implemented a bout 20 minutes before the school day starts.

Small-group instruction

Research indicates that small-group instruction is more effective in helping students acquire phonological awareness than one-on-one and whole group instruction. Small-group instruction may be more effective because students benefit from listening to each other and they are having more opportunities to participate. So it would be preferable to implement the current program to a group of three to ten children.

The children improvement assessment:

The children's improvement will be assessed in two ways:

- Ongoing assessment: the teacher provides feedback to the pupil's performance, which supports the pupil's strength, and modifies pupils´ mistakes.

- Final assessment: by using the early diagnosis test for dyslexia (phonological awareness and phoneme grapheme correspondence). As a post test to compare the level of the child's´ skills before and after the intervention program implementation.

- ***Recommendations for Further Research.***

Further research still needs to consider factors that may be specific to Arabic. One of the main distinguishing features is the nature of phonological awareness development in Arabic. Understanding the process of skill acquisition helps in determining which skill is suitable for a given age and educational level of the child, and so making designing diagnostic and remedial programs easier. The nature of Arabic script (addition of dots, letters cursive nature, modification of the graphic shape, and the use of diacritical markers or short vowels) is the other point in need to further research; because its impact in early reading is not yet folly understood.

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Appendices

Appendices Table

Appendix (1)

Simple, Complex onsets and coda in Arabic

Appendix (1) Simple, Complex onsets and coda in Arabic

Simple onsets

Sound	W. initially	Gloss	Sound	W. medially	Gloss
/b/	bint	girl	/b/	la.ban	yoghurt
/t/	taaj	crown	/t/	ša.tam	curse
/θ/	θa.man	price	/θ/	maθ.wa	destiny
/ð/	ðu.rah	corn	/ð/	mu.ðiiˤ	broadcaster
/s/	sa.laam	peace	/s/	mu.raa.sil	correspondent
/f/	fann	art	/f/	ma.farr	escape

Complex onsets

Clusters	W. initially	Gloss	Cluster	W. initially	Gloss
/bl/	blaad.na	ourcountries	/bt/	Ktaab	book
/dm/	dmuuˤ	tears	/ms/	msam.mam	poisoned
/dʒl/	dʒluud	skins	/md/	/mdam.mar	collapsed/broke
/sl/	slaaħ	weapon	/mdʒ/	mdʒam.ma**d**	frozen
/tm/	tmalmal	complained	/sd/	Sduud	dams
/kθ/	kθiir	many/much	/tb/	Tbuuħ	reveal

Simple coda

Sound	W. initially	Gloss	Sound	W. finally	Gloss
/b/	baab.ha	her door	/k/	baa.bak	your door
/t/	fit.neh	seduction	/m/	kaam.lih	complete (f)
/θ/	muθ.mir	fruitful	/θ/	ħa.raθ	ploughed
/dʒ/	madʒ.ruuħ	injured	/d/	ma.rad	disease
/ð/	mað.buuħ	killed	/ʕ/	mu.ðiiʕ	broadcaster
/s/	mus.lim	Muslim	/t/	mat.taat	rubber

Complex coda

Clusters	W. medially	Gloss	Clusters	W. finally	Gloss
/rd/	ʔard. na	our land	/ms/	Šams	sun
/nt/	bint.hum	their daughter	/bb/	Rabb	God
/ft/	šift.ku	I saw you (pl.)	/lb/	Kalb	dog
/rd/	ward	roses	/md/	Ħamd	praise
/bb/	rabb.ki	your God	/lm/	Ħilm	dream
/ʕt/	biʕt.hum	I sold them	/mm/	ʕaamm	general

Appendix (2)

Phonological Awareness assessment tests

Appendix (2): Phonological Awareness assessment tests

1 - Lindamood Auditory Conceptualization Test – Third Edition (LAC-3) (1979)

Purpose — The LAC-3 is an individually administered norm-referenced assessment that measures the ability to perceive and conceptualize speech sounds using a visual medium.

Population — The LAC-3 is used with children ranging in age from 5 through 18.11 years.

Time — The LAC-3 can be administered in 20–30 minutes.

Description - The LAC-3 measures the ability to distinguish and manipulate sounds which is required for success in reading and spelling. The test uses colored block to allow the student to visually present and manipulate representations of phonemes and felt pads to manipulate the representations of syllables. All words in this assessment are nonsense words.

Benefits -The results of the LAC-3 are helpful for speech-language pathologists, special educators and reading specialists. This test could be included in a battery to help determine the underlying cause for a students reading disability.

Validity/Reliability- Test retest reliability ranged from .96 to .97 for all ages. Reliability was demonstrated using both content and time sampling. Validity was assessed using existing assessments (CTOPP, DAB-3, and TOPAS).

2 - Yopp-Singer Test of Phoneme Segmentation (Yopp, 1995)

Purpose — The Yopp-Singer Test was specifically designed to assess children's ability to isolate and pronounce the individual phonemes in words.

Population — The Yopp-Singer Test can be given to kindergarten, and children who are weak in phonological awareness during first grade.

Time — 5: 10 minutes per child.

Description - The Yopp-Singer test consists of 22 items that are all of the same type. Beginning the test, All the items involve familiar words of just two or three phonemes.

Benefits - Yopp-Singer test is a fine, reliable test of phonemic awareness. It could serve very usefully, for example, to monitor the growth of phonemic awareness in first-grade children as they learn to read.

Validity/Reliability - Yopp-Singer test internal consistency reliability of .95 And it has impressive validity data derived from a seven-year longitudinal study in which the same children that were administered the phoneme segmentation test in kindergarten were followed through sixth grade. A correlation of .74 with total reading score means that performance on the Yopp-Singer test in the second semester of kindergarten is highly correlated with overall reading ability six years later.

3 - The Phonological Awareness Test (Robertson & Salter, 1995)

Purpose — The Phonological Awareness Test provides a comprehensive assessment of student *phonological sensitivity and phonemic reading ability.*

Population — The PAT can be given to children five years of age and older. Although norms extend only through age nine,

Time — 40 minutes

Description *The Phonological Awareness Test (PAT)* is individually test, it *contains five measures of phonological awareness, plus measures of word and syllable segmentation and a measure of sensitivity to rhyme. It also contains three additional subtests that measure knowledge of letter-sound correspondences,* phonemic decoding (ability to read phonetically regular nonwords), and invented *spelling.*

Benefits - The PAT is a well-constructed, comprehensive measure of phonological awareness and phonemic reading skills. The letter knowledge and reading tests may provide a very useful addition for professionals who wish to assess both phonemic awareness and print knowledge at the same time.

Validity/Reliability - The PAT manual Estimates of both test-retest and internal consistency reliability are provided in the manual. The values reported are those that apply to the section of each subtest that measures awareness at the phonemic level. Reliabilities are reported at half-year age intervals between 5 and 10 years of age. Test retest reliability ranged from .71 to .89 for all Subtest Test/Retest Internal Validity Concurrent validity was established by contrasting the performance of groups the PAT successfully discriminated between these groups at five age levels between five and ten.

4- Comprehensive Test of Phonological Processing (CTOPP (Wagner, Torgesen,. & Rashotte, (1999).

Purpose — The CTOPP assesses phonological awareness, phonological memory and rapid naming.

Population — The CTOPP is used with ages 5 – 24.11

Time — The CTOPP takes 30 minutes to administer.

Description - The CTOPP is an individually administered test that comes in two versions. The first version was developed for five to six-year-old children and the second version was developed for individuals seven through 24 years old.

Benefits The CTOPP is designed to identify individuals who are significantly below their peers in phonological abilities, to determine strengths and weaknesses of an individual's developed phonological processes and to document an individual's progress in phonological processing as a consequence of special intervention programs.

Validity/Reliability The CTOPP was normed on over 1,600 individuals ranging in age from 5 through 24 and residing in 30 states. Reliability of the CTOPP was investigated using estimates of content sampling, time sampling, and scorer differences. Most of the average internal consistency or alternate forms reliability coefficients (content sampling) exceed .80. The test/retest (time sampling) coefficients range from .70 to .92. The magnitude of the coefficients reported from all the reliability studies suggests that there is limited error in the CTOPP and that examiners can have confidence in the results.

5 - Tests of Basic Skills (ITBS) (word analysis)(Hoover, Dunbar, & Frisbie,. (2001).

Purpose — The ITBS provides a comprehensive assessment of student progress in major content areas.

Population — The ITBS is designed to be used with Kindergarten through Grade 8 (Levels 5 – 14).

Time — It takes 30 minutes or less to administer each test.

Description - The ITBS Word Analysis test is available at Levels 5 through 9 (Forms A & B). It assesses students' phonological awareness and understanding of word parts. At levels 5 and 6, the focus is on letter identification and letter-sound relationships. All responses are letters or pictures at Level 5, while Level 6 introduces some word responses. Level 7 through 9 also include basic letter-sound questions, but more complex word-building tasks involving affixes and compound words are introduced at these levels as well. At Levels 5 and 6, the tests are available as a Complete Battery, while at Levels 7 and 8, test users may choose booklets containing the Complete, Core, or Survey Battery.

Benefits - The ITBS offers educators a look at how their students are progressing in key academic areas and offers diagnostic data that can be used to drive remediation and better preparation for other high stakes assessments.

Validity/Reliability - Validity and reliability information can be found in the ITBS Guide to Research available from Riverside Publishing Company.

6 - Dynamic Indicators of Basic Early Literacy Skills (DIBELS) (initial sound fluency and phoneme segmentation fluency) (Good, R.H. & Kaminski, R.A. (Eds.) (2002).

Purpose — The DIBELS measures were specifically designed to assess phonological awareness, alphabetic principle and fluency with connected text.

Population — The DIBELS measures are available for students in grades K-6.

Time — Time varies from one to three minutes depending on which measure is being administered.

Description- The DIBELS is a set of standardized, individually administered measures of early literacy development. It is designed to assess the five major skill areas in early reading identified by the National Reading Panel (2000) and the National Research Council (1998). It primarily assesses three of those: Phonological Awareness, Alphabetic Principle and Fluency with Connected Text.

• Phonemic Awareness is measured by Initial Sounds Fluency and Phonemic Segmentation Fluency, Alphabetic Principle is measured by Nonsense Word Fluency Accuracy and Fluency with Connected Text is measured by Oral Reading Fluency

Benefits - The DIBELS allows educators to readily and reliably determine student progress.

Validity/Reliability - DIBELS is not designed to be a nationally norm-referenced test. The research sites from which the validity and reliability information was gathered were not intended to be a normative sample. Instead the measures are designed to provide local normative comparisons. Additional technical adequacy information may be found in Assessment Committee Analysis of Reading Assessment Measures found at.

7 - Bielefelder Screening zur Früherkennung von Lese-chtschreibschwierigkeiten 2. (BISC), H. Jansen, G. Mannhaupt, H. Marx und H. Skowronek(2002)

Purpose — Bielefelder Screening (BISC) was specifically designed to early identification of children at risk for later reading/spelling deficits.

Population — Age standards (N = 1,120) for the test points in time ten months before enrollment and four months before enrollment. **Time —** Bielefelder Screening (BISC) can be administered in approx. 20-25 minutes.

Description - Bielefelder Screening (BISC) is Single test. Which based on the assumption that an insufficiently training in phonological awareness and attention and memory is responsible for the later reading and spelling difficulties. The BISC test consists of several subtests probing mainly phonological awareness (rhyme detection, syllable segmentation, sound categorization, and sound blending) , but also attention and memory(rapid naming, phonological short term memory, and regulation of visual attention.

Benefits - The BISC allows the reliable identification of individual preschool children with a risk to the reading and spelling trouble. From the identified results can immediately draw conclusions for promotions. The BISC can also be applied for Swiss children, but some items must be adapted to Swiss German dialect

Validity/Reliability- The BISC has consistently moderate to high correlations with the performance criteria in the first and second on the school. The screening allows for a good to very good prediction of individual reading spell trouble. The Reliability of the screening is in preschool age over a period of six months at a high training reliability (r = .82).

8 - Test of Phonological Awareness – Second Edition: Plus (TOPA-2+) Torgensen, J.K., & Bryant, B.R. (2004)

Purpose — The TOPA-2+ can be used to determine if first and second-grade students' difficulties in early reading are associated with delays in development of phonological awareness.

Population — Children 5 through 8 years

Time — Kindergarten—30-45 minutes; early elementary—15-30 minutes

Description - The TOPA-2+ is a group administered measure of children's phonological awareness. There are two versions, a kindergarten and an early elementary, that measure young children's ability to isolate individual phonemes in spoken words and understand the relationships between letters and phonemes in English.

Benefits - The TOPA-2+ be used to identify children who may profit from instructional activities to enhance their phonological awareness in preparation for reading instruction**.**

Validity/Reliability - The TOPA-2+ manual provides evidence of internal consistency reliability, test-retest reliability, and interscorer reliability, all of which meet or exceed .80. Evidence is also provided for content-descriptive validity, criterion-prediction validity, and construct identification validity.

9 - Phonological Awareness and Literacy Screening – PreK (PALS-PreK) Invernizzi, Sullivan, Meier,& Swank (2004).

urpose — PALS-PreK is a scientifically based phonological awareness and literacy screening that measures preschoolers developing knowledge of important literacy fundaments.

Population — The PALS-PreK is designed for use with prekindergarten and early kindergarten children.

Time — The PALS-PreK can be administered in 20-25 minutes.

Description: The assessment reflects skills that are predictive of future reading success and measures name writing ability, upper and

lower-case alphabet recognition, letter sound and beginning sound production, print and word awareness, rhyme awareness and nursery rhyme awareness.

Benefits: The PALS-PreK offers guidance to teachers for tailoring instruction to children specific needs.

Validity/Reliability - Pilot data and data from regular screenings provide evidence of the reliability (including internal consistency and inter-rater reliability and validity (including content, construct, and criterion-related validity) of PALS-PreK for the purposes for which it was intended.

10 - Phonological Awareness and Literacy Screening – 1st - 3rd Grade(PALS-1-3) Invernizzi, M., Meier, J. & Juel, C. (2005)

Purpose — PALS 1-3 measures young children's knowledge of important literacy fundamentals.

Population — PALS 1-3 is designed to be used with children in grades one,, two, and three.

Time — There are no time limits, but each student should be assessed within a two weeks window.

Description - PALS 1-3 is used to screen and identify students in need of additional instruction based on the entry level test scores and to diagnose specific skill deficits in students whose entry level scores do not meet grade-level criteria. Level A: the Oral Reading in Context task is used to assess three measures of oral reading fluency (a) oral reading accuracy, (b) phrasing, intonation, and expression and (c) reading rate. Students whose entry level scores do not meet grade level criteria are further assessed with Level B: Alphabetics—Alphabet Recognition, Letter

Sounds and Concept of Word. If Level B benchmarks are not met, children are assessed using Level C: Phonemic Awareness—Blending and Sound-to-Letter,

Benefits - PALS 1-3 can be used as a diagnostic tool to provide teachers with explicit information to help guide their teaching.

Validity/Reliability - Reliability and validity measures have been regularly gathered since 1997, and are well within expected ranges. Predictive validity measures have been conducted using the Stanford-9 (required of students in Virginia) as well as subsequent measures gathered using the PALS 1-3.

11 - Phonological Awareness and Literacy Screening – Kindergarten (PALS-K) Invernizzi, M., Juel, C., Swank, L., & Meier, J. (2006).

Purpose — The major purpose of the PALS-K is to identify students who are below grade-level expectations in several important literacy fundamentals and thus are at risk of reading difficulties and delays. As a diagnostic tool, PALS-K can be used to assess what students already know about the English writing system and what they need to learn to become readers.

Population — The PALS-PreK is designed for use with kindergarten children.

Time — The PALS-PreK can be administered in 20-25 minutes.

Description - The *phonological awareness* component of the PALS-K instrument is a measure of young children's ability to identify rhyme units and isolate beginning sounds. The *literacy* component of the PALS-K instrument is a measure of young children's knowledge of

important literacy fundamentals: (a) alphabet knowledge, (b) knowledge of letter sounds, (c) phoneme-grapheme correspondences, (d) concept-of-word, and (e) word recognition.

Benefits- PALS provides an assessment tool that clearly meets screening and diagnostic assessment purposes, and a mid-year assessment tool aimed at progress monitoring.

Validity/Reliability - PALS-K has good evidence of reliability and construct, concurrent, and predictive validity. PALS-K shows evidence of both internal consistency and inter-rater reliability, indicating that it can be administered and scored consistently by different users. PALS-K also shows evidence of content, construct, and criterion-related validity, suggesting that PALS-K indeed captures the underlying constructs associated with emergent literacy.

12 - Münsteraner Screening zur Früherkennung von Lese- und Rechtschreibschwierigkeiten (MÜSC) Gerd Mannhaupt(2007)

Purpose — The major purpose of the Münsteraner Screening is to early detection of reading difficulties **(**identification of children at risk for later reading deficits).

Population — Münsteraner Screening is designed to be used with the first grad children.

Time — Münsteraner Screening can be administered in 40 minutes.

Description - The Munster screening for early detection of reading and spelling difficulties is a diagnostic procedure that is collecting the necessary prerequisites for successful reading and letters learning at the beginning of the first school possible. So that it used in the first weeks

after school starts. And it based on two components, namely the phonological awareness which include (rhyme detection, syllable segmentation, sound categorization, and sound blending) and attention and memory which include (rapid naming, phonological short term memory, and regulation of visual attention).

Benefits - The Munster screening is designed to early identification of at risk children, to determine strengths and weaknesses of an individual's developed. It's considering an economical way to identify those children who need assistance; because it has the advantage that it is a group survey procedure. It is therefore used for the educational needs in the conditions of the reading and writing learning, to immediate and directly enrollment.

Validity/Reliability - There are two measures of validity for the instrument: the construct validity was determined by the factor structure of the different subtests resulting in three underlying factors representing phonological awareness (with the subtests R, WR, LA LWZ, and SS loading on this factor), attention and memory as second factor (loading on WVS-quality and WVS-speed) and a third factor related to the speed of memory recall. (FA2 and FA 1). The criteria validity was determined be the correlation with the BISC-criteria concerning the risk-classification of BISC and MÜSC giving adequate correlation coefficients between .66 and .90 based on a simple of 79 children. The total value of The Munster screening reliability is good.

Appendix (3)

Phonological Awareness remedial programs

Appendix (3): Phonological Awareness remedial programs

1- Sounds Abound (Hugh Catts and Tina Vartiainen, 1993)

Aim: Sounds Abound program is designed to help students, ages become aware of the speech sounds in words and how the alphabet represents these sounds.

Age: Kindergarten—Grade 1.

Discretion: Sounds Abound is not presented as an organized curriculum, but the order of activities presented in the manual does move gradually from easier to more difficult. So that it could be used by paraprofessionals or parent volunteers to

Strengthen phonological awareness in small groups of children.

The activities in Sounds Abound focus on four broad areas:

- *Rhyme*: judging whether words rhyme or not, and generating rhyming words

- *Beginning and Ending Sounds*: whether words begin or end with the same sound, and produce words beginning with the same sound as another word.

- *Segmenting and Blending*: segment words into syllables, blending of syllables into words, segment and pronounce the phonemes in words, and blending individual phonemes into words

- *Putting Sounds Together with Letters*: These activities teach children the sounds associated with seven consonants and five vowels and then provide structured activities in which children learn to make different words by changing the first letter.

2 - Phonemic Awareness in Young Children: A Classroom Curriculum (Marilyn Jager Adams, Barbara R. Foorman, Ingvar Lundberg, Terry Beeler, 1997)

Aim: Phonemic Awareness in Young Children aims to build phonological awareness in young children. In a typical kindergarten classroom.

Age: kindergarten classrooms as well as first graders who are lagging behind their peers in the development of phonological awareness.

Discretion: It is essentially a carefully sequenced series of game-like activities that can be used with large or small groups to build phonological awareness in young children. In a typical kindergarten classroom, the program contains enough activities to occupy 15-20 minutes a day for eight months of the school year.

This program contains a series of activities that are graded in difficulty, along with a recommended sequence for introducing the activities. The goal of all the activities is for the children to have fun while learning to listen for the sounds in words. Following is the recommended sequence of activities in the program:

Listening games: listen selectively to sounds in their environment).

Rhyming activities: listening to rhyming sentences and stories, generating rhymes), Sentences and words: awareness that sentences are made of words.

Syllables: count syllables in words and blend syllables together to make words.

Initial and final sounds: comparing first sounds in words, pronouncing the first sounds, or changing the first sounds to make other words, and then do similar activities with last sounds).

Phonemes: represent individual sounds in words .blend sounds together to make words.

Letters: Children are taught the letters used to represent a small number of consonant and vowel sounds, and then practice using these letters to represent the sounds in words.

3 - Sound Start: Teaching Phonological Awareness in the Classroom (Orna Lenchner & Blanche Podhajski, 1997)

Aim: Sound Start aims to stimulate phonological awareness that is appropriate for pre-school through first grade children.

Age: Preschool–Grade 1.

Discretion: *It is designed to serve as a regular class curriculum in phonological awareness primarily for the kindergarten year*, By providing instructional practice in it. Following most of the activities, the authors offer special instructional tips, as well as activities to provide extra instruction and practice for children who are having difficulty mastering the skill being taught.

Following is a list of the specific skills taught in the program:

- *Rhyme:* • Recognition, • Completion and • Production.

- *Syllable Awareness***:** • Segmentation, and deletion.

- *Phonemic Awareness***:** Initial sound recognition, Phoneme segmentation, Phoneme deletion, Phoneme substitution, and Phoneme blending.

- *Activities with Letters***:** Matching letters to first sounds in words.

The program demonstrates video that is included with the materials. It provides delightful examples of many of the activities being performed by the author with a small group of children. This video should be useful for in service training of teachers and for showing to parents as

part of parent programs.

4 - The Phonological Awareness Kit, Beginning and Intermediate (Carolyn Robertson & Wanda Salter, 1995, 1997)

Aim: The Phonological Awareness Kit Designed for students, who have experienced difficulty learning to read, as a direct instruction supplemental phonological awareness approach to enable students to solve the phoneme/grapheme code of the English language.

Age: Kindergarten–Grade 2; Grades 3–8

Discretion: The Phonological Awareness Kit is a program of instruction in phonological awareness that comes in two versions. The beginning kit is designed for small group or whole classroom instruction with children in kindergarten through 2nd grade, while the intermediate kit is appropriate for individual or small group instruction with 3rd through 8th grade children who are having difficulties acquiring phonemic awareness and phonetic reading skills. Both the beginning and intermediate kits contain a range of instructional activities appropriate to their intended age groups. The activities in this program are not embedded in as game-like a format as is the case with some of the other programs, but they are intended to be fun and could easily be adapted for use within games.

The activities in each kit are described below:

Beginning Level Kit

- rhyme recognition and production
- Segmenting sentences into words and compound words into root words
- Counting the syllables in words

Isolation, segmentation, blending, deletion, and substitution of phonemes in words

- Letters sounds and beginning reading and spelling

Intermediate Level Kit

- Isolating, counting, and deletion of syllables in words.

- Isolation, blending, segmenting, deletion, and substitution of phonemes in words

• Activities with letters that involve learning all the letter sounds, initial and final blend, consonant digraphs, vowel dipthongs, and some simple phonics rules.

5- Right into Reading a Phonics-Based Reading and Comprehension Program Grades K–3. Jane Ervin (2004)

Aim: Right into Reading, Program Aims to develop both of the following elements: phonemic awareness, phonics, comprehension, vocabulary, fluency.

Age: (Grades K–3) beginning readers, children at risk, or older children who are having difficulty learning to read.

Discretion: *Right into Reading* provides a solid foundation in basic sounds and a wide variety of readings from the earliest level. Phonics skills are introduced in a carefully ordered sequence of “bite-size” lessons, the sound being taught is emphasized in red text at the beginning of the lesson, The stories and selections contain only the sounds that have been taught. This means that students can fully concentrate on understanding and enjoying what they read. Each reading passage is followed by comprehension questions and writing practice. It includes four structured workbooks:

- *Jump Right into Reading* introduces the letters of the alphabet (only regular sounds) in carefully sequenced groups. Students learn how letters and their sounds combine to make words that have meaning.

- *Right into Reading 1Grades 1*–2 : Book 1 covers short vowels, blends, syllables, and long vowels. Narrative topics include Benjamin Franklin and the story *How Bat Got Her Wings*.
- *Right into Reading 2 Grades* 2–3: Book 2 covers consonant teams (*sh*, *ch*, *th*, and *wh*), vowels with *r*, *y* as a vowel, and irregular double vowels. Narrative topics include *The Soup Stone* and *A Wolf in Sheep's Clothing*.
- *Right into Reading 3 Grades 3–4*: Book 3 covers the advanced phonics skills necessary for students to read fluently with comprehension.

Every book followed by Teacher's Key Book contains a brief introduction to the teacher and reduced and annotated student pages for every book.

6 - Münsteraner Trainingsprogramm Gerd Mannhaupt (2006)

Aim: Münsteraner Trainingsprogramm Program Aims to develop phonological awareness and letters sounds correspondences.

Age: first grader (first graders who are lagging behind their peers in the development of phonological awareness, and children with special needs).

Discretion: The Münsteraner Trainingsprogramm is designed for students of the first half of the first class, where conditions for the acquisition of written language are missing. The Muenster training program is primarily phonological awareness training, the precursor to a central skill in reading and writing represents. The MÜTER includes 80 units from 10 to 15 minutes, with a daily lesson to be carried out so that

the training covers (6 months) over a school semester. group sizes of at least four children a maximum of eight. The program includes exercises and games to the assisted areas sentence:

- *Rhyme*: recognition and production

- *Sentences and words*: Segmenting sentences into words and compound words into root words.

- *Syllables:* Counting the syllables in words, and syllables blending and segmenting.

- *Phonemes*- Isolation, segmentation, blending, deletion, and substitution of phonemes in words

- Letters sounds: correspondences between letters and sounds.

Appendix (4)
Hand book of the early diagnosis test for dyslexia (phonological awareness, and phoneme grapheme correspondence)(Example)

دليل المعلم

اختبار التشخيص المبكر للعسر القرائى

(الوعى الصوتى – ارتباط الصوت بالحرف)

إعداد

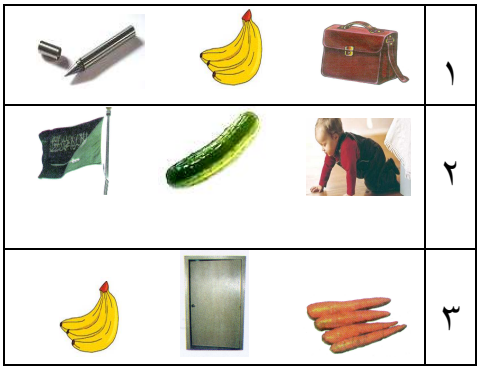
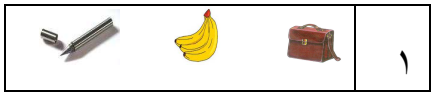
محمد سعد بكرى رمضان

المدرس المساعد بكلية التربية – جامعة بنىسويف

تقديم

		أنا أريد أن أقوم معكم ببعض الألعاب أوالألغاز . والموضوع بتلخيص هو أن تمعن السمع ، أو تمعن النظر. وأنا متأكد أن عندكم رغبة للمشاركة فى اللعب. ويحتاج كل منكم إلى قلم رصاص لكى يستطيع المشاركة معنا. اسحب قلما لو سمحت . ونبدأ أولا بأن أعطى كل واحد منكم كراسة ، ثم نقوم بعمل فريقين .	
توزع كراسة الاختبار (أ) لكل طفل كراسة.			
		يستلم الفريق الأول كراسة الاختبار (أ) . هل ترون حرف (أ) ؟	
توزع كراسة الاختبار (ب) لكل طفل كراسة.			
		يستلم الفريق الثانى كراسة الاختبار (ب) . هل ترون حرف (ب) ؟ من يستطيع أن يكتب اسمه فليكتبه فى الصفحة رقم (1) .	
تعرض عليهم الصفحة رقم (3)			
		بالنسبة للبقية – الذين لا يستطيعون كتابة أسمائهم – يذهب المختبر إليهم ويساعدهم.	

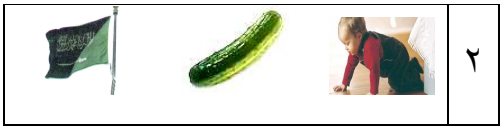
1 – القافية

	افتح لوسمحت الصفحة رقم (2) فى كراسة الألغاز
يشغل المعلم (المختبر) جهاز العرض فوق الرأس ، ويضع عليه الشفافية رقم (1) (القافية)، تلك التى توافق الصفحة رقم (2) فى كراسات الأطفال ، وينتظر قليلا حتى يكون كل الأطفال مستعدين	
	تتناول اللعبة الاولى كلمات متشابهة فى السمع. فعلى سبيل المثال : خروف – حروف ، مصباح - مفتاح ، شعر – تمر .
	والآن ، سأقول لكم كلمة : علم. و فى الصف رقم (1) ترون ثلاث صور من بينها واحدة تشبه فى سماعها كلمة علم (حقيبة – موز – قلم)
ويشير المعلم بأصبعه إلى الصور وهو ينطق اسم كل منها.	-1 
	يسأل المعلم التلاميذ : هل تعلمون أى الكلمات تشبه فى السمع كلمة علم؟

إذا كانت الإجابة صحيحة	**ينتقل المعلم إلى المثال التالى** ⬅
	نعم كلمة قلم تشبه فى سماعها كلمة علم.
تضع علامة صواب على الصورة المتقافية.	

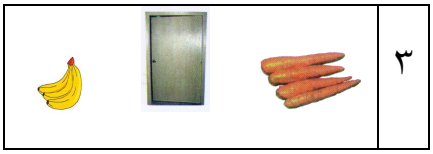
	انظروا أنا وضعت علامة صواب على كلمة علم ، ضعوا كلكم علامة صواب على قلم كما فعلت.

إذا كانت الإجابة غير صحيحة	
	لا :كلمة حقيبة أو موز (الكلمتان المتبقيتان)لا تشبه فى السمع كلمة علم، اسمعوا معى مرة أخرى . علم – حقيبة ، علم – موز ، علم – قلم. أى الكلمتين تتشابهان فى السماع ؟
إذا كانت الإجابة صحيحة	**ينتقل المعلم إلى المثال التالى** ⬅
	نعم كلمة قلم تشبه فى سماعها كلمة علم.
تضع علامة صواب على الصورة المتقافية.	
	انظروا أنا وضعت علامة صواب على كلمة قلم ، ضعوا كلكم علامة صواب على قلم كما فعلت.
إذا كانت الإجابة غير صحيحة	
	لا علم وحقيبة لا تتشابهان فى السماع. بل علم وقلم هما اللذان يتشابهان فى السماع
تضع علامة صواب على الصور المتقافية.	
	انظروا أنا وضعت علامة صواب على كلمة علم ، ضعوا كلكم علامة صواب على قلم كما فعلت.

فى المثال 2 **يسير المعلم على نفس نسق المثال الأول.**	-2 ٢ 
	والآن ، سأقول لكم كلمة ثانية ..... : قفل. وهنا فى الصف رقم (2) ترون ثلاث صور من بينها واحدة تشبه فى سماعها كلمة قفل (طفل – خيار – علم).
يشير المعلم بأصبعه إلى الصور وهو ينطق اسم كل منها.	
	يسأل المعلم التلاميذ : هل تعلمون أى الكلمات تشبه فى السمع كلمة قفل؟

إذا كانت الإجابة صحيحة	**ينتقل المعلم إلى المثال التالى**
	نعم كلمة طفل تشبه فى سماعها كلمة قفل.
تضع علامة صواب على الصور المتقافية.	
	انظروا أنا وضعت علامة صواب على كلمة طفل ، ضعوا كلكم علامة صواب على طفل كما فعلت.

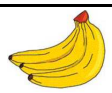
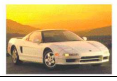
إذا كانت الإجابة غير صحيحة	
	كلمة خيار أو علم (الكلمتان المتبقيتان)لا تشبه فى السمع كلمة طفل، اسمعوا معى مرة أخرى . قفل – طفل ، قفل – خيار، قفل – علم. أى الكلمتين تتشابهان فى السماع؟

إذا كانت الإجابة صحيحة	**ينتقل المعلم إلى المثال التالى** ⬅
	نعم كلمة قفل تشبه فى سماعها كلمة طفل.
تضع علامة صواب على الصورة المتقافية.	
	انظروا أنا وضعت علامة صواب على كلمة طفل ، ضعوا كلكم علامة صواب على طفل كما فعلت.
إذا كانت الإجابة غير صحيحة	
	لا خيار أو علم لا تتشابهان فى السماع. بل قفل وطفل هما اللذان يتشابهان فى السماع
تضع علامة صواب على الصور المتقافية.	
	انظروا أنا وضعت علامة صواب على كلمة طفل ، ضعوا كلكم علامة صواب على طفل كما فعلت.
فى المثال 3 يسير المعلم على نفس نسق المثال الأول.	-3 ٣ 
	والآن ، سأقول لكم الكلمة الثالثة ، وعليكم أن تبحثوا بين الكلمات الثلاثة عن الكلمة التى تشبه فى السماع الكلمة التى سأقولها ، وتضعون عليها علامة صواب ولكن ابتداء من الآن لابد أن يكون الكل هادئا الكلمة هى : ناب. انظر لصور الصف الثالث (جزر – باب – موز) هل تعلمون أى الكلمات الثلاثة السابقة تشبه فى سماعها ناب؟

إذا كانت الإجابة صحيحة	ينتقل المعلم إلى البنود الاختبارية ⬅
	نعم كلمة باب تشبه فى سماعها كلمة ناب.
تضع علامة صواب على الصورة المتقافية.	
	انظروا أنا وضعت علامة صواب على كلمة باب ، ضعوا كلكم علامة صواب على باب كما فعلت.

إذا كانت الإجابة غيرصحيحة	
	كلمة جزر أو موز (الكلمتان المتبقيتان)لا تشبه فى السمع كلمة ناب، اسمعوا معى مرة أخرى . ناب – جزر ، ناب – باب، ناب – موز. أى الكلمتين تتشابهان فى السماع؟
إذا كانت الإجابة صحيحة	**ينتقل المعلم إلى البنود الاختبارية ⬅**
	نعم كلمة باب تشبه فى سماعها كلمة ناب.
تضع علامة صواب على الصورة المتقافية.	
	انظروا أنا وضعت علامة صواب على كلمة باب ، ضعوا كلكم علامة صواب على باب كما فعلت.
إذا كانت الإجابة غير صحيحة	
	لا ، جزر وموز لا تتشابهان فى السماع. بل ناب و باب هما اللذان يتشابهان فى السماع

تضع علامة صواب على الصور المتقافية.	
	انظروا أنا وضعت علامة صواب على كلمة باب ، ضعوا كلكم علامة صواب على باب كما فعلت.
بعد ذلك	في الصفحة التالية (صفحة رقم 3) هناك ألغاز (ألعاب) أكثر ، ومن الآن سأقول لكم على التوالى كلمة ، وأنتم تبحثون بين الكلمات الثلاثة وتستخرجون الكلمة التى تشبه الكلمة التى قلتها فى السماع ،وتضعون عليها علامة صواب ، ثم تنتظرون بدون كلام حتى أقول الكلمة التالية وتفعلوا مثل ما فعلتم ، وهكذا حتى نهاية الكلمات، و من الآن فصاعدا لن أقول لكم ما الكلمة الصواب. هل فهمتم كل شيىء؟
ينتظر الإجابة. فى عناصر الاختبار تنطق الكلمة الأولى مرة واحدة ، ودون تأكيد ، أو تصحيح ، وتترك الأطفال يضعون علامة صواب على ما يرونه صحيحا وبعد خمس عشرة ثانية تنتقل إلى الكلمة التالية، وتقول للأطفال إذا اقتضت الحاجة	ضع علامة صواب على ما تعتقد أنه صحيح. . .

الصف 1: حرف الصف 2: لسان الصف 3: حروف . الصف 4: شجرة . الصف 5: نيل . الصف 6: ثعلب . الصف 7: جبل . الصف 8: مسمار . الصف 9: حمار . الصف 10 حصان.		١	  
		٢	  
		٣	  
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Appendix (5)
Example of Test book (A) of the early diagnosis test for dyslexia (phonological awareness, and phoneme grapheme correspondence)

اختبار التشخيص المبكر للعسر القرائى

(الوعى الصوتى – ارتباط الصوت بالحرف)

إعداد

محمد سعد بكرى رمضان

المدرس المساعد بكلية التربية – جامعة بنىسويف

أ

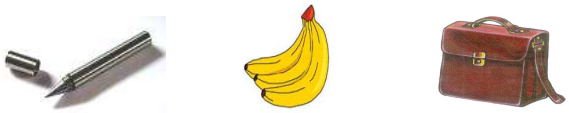
الاسم : ----------

تاريخ الميلاد :----------

المدرسة : ----------

المختبر : ----------

تاريخ الاختبار : ----------

	١
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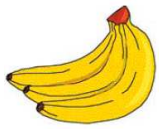
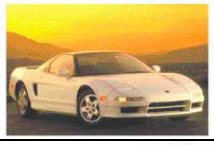
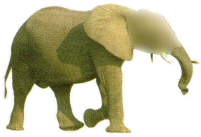
	٣

  	١
  	٢
  	٣
  	٤
  	٥
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Appendix (6)
Example of test book (B) of the early diagnosis test for dyslexia (phonological awareness, and phoneme grapheme correspondence)

اختبار التشخيص المبكر للعسر القرائى

(الوعى الصوتى – ارتباط الصوت بالحرف)

إعداد

محمد سعد بكرى رمضان

المدرس المساعد بكلية التربية – جامعة بنى سويف

ب

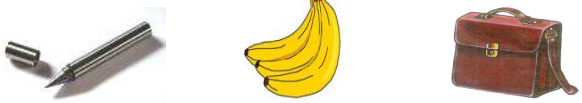
الاسم : ----------

تاريخ الميلاد :----------

المدرسة : ----------

المختبر : ----------

تاريخ الاختبار : ----------

	١
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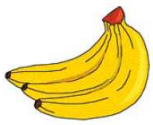
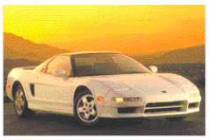
	٣

  	١
  	٢
  	٣
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  	٥
  	٦
  	٧
  	٨
  	٩
  	١٠

Appendix (7)
Test Evaluation "A" of the early diagnosis test for dyslexia (phonological awareness, and phoneme grapheme correspondence)

الصورة

أ

تقويم الاختبار أ

اسم الطفل		ذكر □		أنثى □	
المدرسة					
الفصل		العام		الشهر	اليوم
تاريخ الميلاد					
العمر					
تاريخ الاختبار					

1- القافية (ق)				
1 / 0				
1	بطيخ	ظرف	موز	
2	حذاء	حصان	وردة	
3	ديك	سيارة	خروف	
4	حصان	خيار	بقرة	
5	بيضة	فراشة	فيل	
6	ديك	أرنب	بيضة	
7	جمل	مسجد	فراشة	
8	منشار	باب	رمان	
9	جلباب	خيار	جزر	
10	بطيخ	يد	ثعبان	
		المجموع		

2- تقسيم المقاطع (ت س)				
1 / 0				
1	موز		2	
2	حصان		3	
3	فيل		2	
4	علم		3	
5	مسجد		3	
6	أرنب		3	
7	جمل		3	
8	منشار		3	
9	جزر		3	
10	ثعبان		3	
	المجموع			

3- دمج المقاطع (د م)				
1 / 0				
1	حقيبة	مفتاح	موز	ظرف
2	حبل	وردة	حصان	ديك
3	تاج	خروف	ديك	تمساح
4	بقرة	حصان	خيار	خروف
5	طفل	طاووس	فراشة	فيل
6	عين	علم	أرنب	بيضة
7	جمل	مسجد	فراشة	موز
8	رمال	باب	رمان	ثعبان
9	جاموسة	جمل	جزر	خيار
10	سلم	سرير	يد	ثعبان
	المجموع			

4 – تعرف المقطع الأول (ت م أ)				
1 / 0				
1	ساعة	سلم	وردة	
2	جمل	أسد	ثعبان	
3	مدرسة	مسجد	قفل	
4	سرير	عنب	جزر	
5	زرافة	زيت	موز	
6	بطيخ	رمان	أرنب	
7	منشار	مشط	سيارة	
8	وردة	بقرة	بطيخ	
9	دبابة	علم	ديك	
10	فراشة	موز	فيل	
	المجموع			

5 – ربط الصوت بالحرف (ص ح)				
1 / 0				
1	ك	ل	ث	
2	ص	خ	س	
3	ع	ش	ن	
4	ش	ز	س	
5	ص	ث	ض	
6	ذ	ر	خ	
7	د	ق	ز	
8	و	ط	ت	
9	خ	س	ح	
10	ك	ر	ذ	
	المجموع			

Appendix (8)
Test Evaluation "B" of the early diagnosis test for dyslexia (phonological awareness, and phoneme-grapheme correspondence)

الصورة
ب

تقويم الاختبار ب

اسم الطفل	ذكر □	أنثى □
المدرسة		
الفصل	العام	الشهر	اليوم
تاريخ الميلاد			
العمر			
تاريخ الاختبار			

1- القافية (ق)

				1 / 0
1	بطيخ	موز	ظرف	
2	حصان	حذاء	وردة	
3	ديك	خروف	سيارة	
4	حصان	خيار	بقرة	
5	بيضة	فيل	فراشة	
6	ديك	بيضة	أرنب	
7	جمل	مسجد	فراشة	
8	باب	رمان	منشار	
9	جلباب	خيار	جزر	
10	بطيخ	يد	ثعبان	
	المجموع			

2- تقسيم المقاطع (ت س)

				1 / 0
1	موز		2	
2	حصان		3	
3	فيل		2	
4	علم		3	
5	مسجد		3	
6	أرنب		3	
7	جمل		3	
8	منشار		3	
9	جزر		3	
10	ثعبان		3	
	المجموع			

3- دمج المقاطع (د م)

				1 / 0
1	حقيبة	مفتاح	ظرف	موز	
2	حبل	حصان	وردة	ديك	
3	خروف	ديك	تمساح	تاج	
4	بقرة	خيار	حصان	خروف	
5	طاووس	طفل	فراشة	فيل	
6	عين	أرنب	علم	بيضة	
7	جمل	فراشة	موز	مسجد	
8	رمال	رمان	باب	ثعبان	
9	جزر	جاموسة	جمل	خيار	
10	سلم	يد	ثعبان	سرير	
	المجموع				

4 – تعرف المقطع الأول (ت م أ)

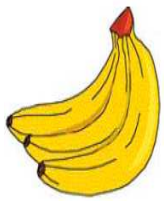
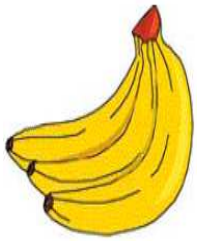
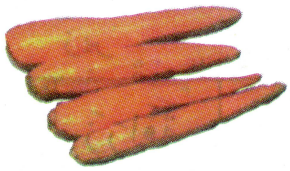
				1 / 0
1	وردة	ساعة	سلم	
2	أسد	جمل	ثعبان	
3	مسجد	مدرسة	قفل	
4	سرير	جزر	عنب	
5	زرافة	موز	زيت	
6	بطيخ	أرنب	رمان	
7	مشط	منشار	سيارة	
8	وردة	بطيخ	بقرة	
9	دبابة	ديك	علم	
10	موز	فراشة	فيل	
	المجموع			

5 – ربط الصوت بالحرف (ص ح)

				1 / 0
1	ل	ك	ث	
2	خ	ص	س	
3	ن	ع	ش	
4	س	ز	ش	
5	ض	ث	ص	
6	ر	ذ	خ	
7	ق	د	ز	
8	ط	و	ت	
9	س	خ	ح	
10	ك	ر	ذ	
	المجموع			

Appendix (9)
Test Transparencies of the early diagnosis test for dyslexia (phonological awareness, and phoneme-grapheme correspondence)

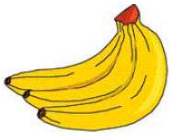
1– القافية (ق) :

١			
٢			
٣			

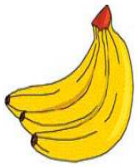
2 – تقسيم المقاطع (ت م) :

١		
٢		
٣		

3- دمج المقاطع (د م):

١				
٢				
٣				

4 – تعرف المقطع الأول(ت م أ):

١			
٢			
٣			

5- ارتباط الصوت بالحرف (ص ح):

١		ك ل ع
٢		ت ب ط
٣		ف غ ذ

Appendix (10)
Time plan of the treatment program

أهداف البرنامج

المهارة	المهارات الفرعية	الهدف السلوكى
1- القافية	**تنمية قدرة التلميذ على تعرف وتمييز وإنتاج القافية.**	بعد الانتهاء من تدريس مهارات القافية يتوقع أن يكون التلميذ قادرا على أن: 1- يتعرف الكلمات المقفاة. 2- يميز الكلمات المقفاة بين كلمات مقفاة وغير مقفاة. 3- ينتج كلمات تتفق مع كلمة سمعها فى القافية.
2- الجمل	**تنمية قدرة التلميذ على عد، دمج ،تقسيم كلمات الجملة**	بعد الانتهاء من تدريس مهارات الجملة يتوقع أن يكون التلميذ قادرا على أن: 1- أن يعد الكلمات الموجودة فى جملة. 2- أن يدمج الكلمات لتكوين الجمل باستخدام لعبة بناء الجملة 3- أن يدمج الكلمات لتكوين الجمل باستخدام لعبة ناول واجلس. 4- أن يقسم الجمل إلى كلمات باستخدام لعبة القفز. 5- أن يقسم الجمل إلى كلمات باستخدام لعبة مربع الكنن.
3- مقاطع	**تنمية قدرة التلميذ على تعرف المقطع الأول فى الكلمة.**	بعد الانتهاء من تدريس مهارات التعرف على المقطع الأول يتوقع أن يكون التلميذ قادرا على أن: 1- يخمن التلميذ الكلمة باستخدام المقطع الأول. 2-- -يتعرف المقطع الأول القصير المغلق باستخدام لعبة البحث عن مشابه 3- يتعرف المقطع الأول القصير المغلق باستخدام لعبة الكراسى الموسيقية. 1- يتعرف المقطع الأول القصير المفتوح باستخدام لعبة البحث عن مشابه 2- يتعرف المقطع الأول القصير المفتوح باستخدام لعبة الكراسى الموسيقية. 3- يتعرف المقطع الأول المتوسط باستخدام لعبة البحث عن مشابه. 4- يتعرف المقطع الأول المتوسط باستخدام لعبة الكراسى الموسيقية. 5- يميز المقطع الأول القصير المغلق عن غيره من المقاطع باستخدام لعبة البحث عن مشاغب. 6- يميز المقطع الأول القصير المفتوح عن غيره من المقاطع باستخدام لعبة البحث عن مشاغب. 10- يميز المقطع الأول المتوسط عن غيره من المقاطع باستخدام لعبة البحث عن مشاغب.
	تنمية قدرة التلميذ على عد المقاطع.	بعد الانتهاء من تدريس مهارات عد المقاطع يتوقع أن يكون التلميذ قادرا على أن: 1- يعد مقاطع الكلمة باستخدام التصفيق. 2- يعد مقاطع الكلمة باستخدام لعبة سقوط الذقن. 3- يصنف الصور وفقا لعدد المقاطع.
	تنمية قدرة التلميذ على دمج المقاطع.	بعد الانتهاء من تدريس مهارات دمج المقاطع يتوقع أن يكون التلميذ قادرا على أن: 1- يدمج مقطعين ليكون كلمة باستخدام لعبة ماذا فى الصندوق. 2- يدمج ثلاثة مقاطع أو أكثر ليكون كلمة باستخدام لعبة ماذا فى الصندوق. 3- يدمج مقطعين ليكون كلمة باستخدام لعبة ناول واجلس. 4- يدمج ثلاثة مقاطع أو أكثر ليكون كلمة باستخدام لعبة ناول واجلس

المهارة	المهارات الفرعية	الهدف السلوكى
	تنمية قدرة التلميذ على تقسيم المقاطع	بعد الانتهاء من تدريس مهارات تقسيم المقاطع يتوقع أن يكون التلميذ قادرا على أن: 1- يقسم كلمة مكونة من مقطعين إلى مقاطعها باستخدام لعبة القفز . 2 - يقسم كلمة مكونة من مقطعين إلى مقاطعها باستخدام الفيشات. 3- يقسم كلمة مكونة من ثلاثة مقاطع أو أكثر إلى مقاطعها باستخدام الفيشات. 4- يقسم كلمة مكونة من مقطعين إلى مقاطعها باستخدام أصابع اليد. 5- يقسم كلمة مكونة من ثلاثة مقاطع أو أكثر إلى مقاطعها باستخدام أصابع اليد
4- ارتباط الصوت بالحرف	**تنمية قدرة التلميذ على تعرف وتمييز أصوات الحروف الهجائية، وربط الصوت بالحرف الذى يقدمه**	بعد الانتهاء من تدريس مهارات ارتباط الصوت بالحرف لكل حرف من حروف الهجائية العربية يتوقع أن يكون التلميذ قادرا على أن: 1- يتعرف على أصوات الحرف. 2- أن يميز الصوت المفتوح عن المضموم عن المكسور. 3-أن يميز أصوات كل حرف عن غيره من أصوات الحروف الأخرى. 4- يتعرف على شكل الحرف مع كل حركة. 5- يربط الصوت بالحرف الذى يقدمه.

التوزيع الزمنى لوحدات البرنامج العلاجى

الأسبوع الأول : قافية	الأسبوع الثانى : كلمات
الأحد : اليوم الأول : تعرف الكلمات المقفاة. الاثنين: تعرف القافية: لعبة الكراسى الموسيقية. الثلاثاء: تعرف القافية: لعبة الكراسى الموسيقية الأربعاء: تمييز القافية : لعبة البحث عن مشاغب. الخميس : إنتاج القافية : لعبة إنى أرى ما لا ترون	الأحد: عد الكلمات فى الجملة باستخدام لعبة القفز الاثنين: دمج الكلمات لتكوين الجمل باستخدام لعبة بناء الجملة الثلاثاء دمج الكلمات لتكوين الجمل باستخدام لعبة ناول واجلس الأربعاء تقسيم الجمل إلى كلمات باستخدام لعبة القفز الخميس تقسيم الجمل إلى كلمات باستخدام مربع الكنن
الأسبوع الثالث مقاطع وحروف	**الأسبوع الرابع مقاطع وحروف**
الأحد تخمين الكلمة باستخدام المقطع الأول : لعبة انتبه إنه اسمك الاثنين سيارة نقل حرف ألف الثلاثاء: تعرف المقطع الأول : لعبة البحث عن مشابه (مقطع قصير" ساكن+ حركة قصيرة") الأربعاء: دعنا نتظاهر : حرف الباء الخميس سيارة نقل حرف تاء	الأحد: تعرف المقطع الأول : لعبة الكراسى الموسيقية الاثنين: سيارة نقل الحرف دال الثلاثاء: دعنا نتظاهر :الحرف ميم الأربعاء: تعرف المقطع الأول : لعبة البحث عن مشابه (مقطع قصير" ساكن+ حركة طويلة") الخميس: دعنا نتظاهر :الحرف نون
الأسبوع الخامس مقاطع وحروف	**الأسبوع السادس: مقاطع وحروف**
الأحد: سيارة نقل الحرف كاف الاثنين: : تعرف المقطع الأول : لعبة الكراسى الموسيقية (مقطع قصير: ساكن + حركة طويلة) الثلاثاء: سيارة نقل الحرف قاف الأربعاء: دعنا نتظاهر :الحرف جيم الخميس: تعرف المقطع الأول : لعبة البحث عن مشابه (مقطع متوسط : ساكن حركة ساكن)	الأحد: سيارة نقل الحرف واو الاثنين: تعرف المقطع الأول : لعبة الكراسى الموسيقية (مقطع متوسط: ساكن + حركة + ساكن) الثلاثاء : دعنا نتظاهر :الحرف حاء الأربعاء: تمييز المقطع الأول : لعبة البحث عن مشاغب (مقطع قصير" ساكن+ حركة قصيرة") الخميس: سيارة نقل الحرف خاء
الأسبوع السابع : مقاطع وحروف	**الأسبوع الثامن : مقاطع وحروف**
الأحد: تمييز المقطع الأول : لعبة البحث عن مشاغب (مقطع قصير" ساكن+ حركة طويلة") الاثنين: دعنا نتظاهر :الحرف راء الثلاثاء: تمييز المقطع الأول : لعبة البحث عن مشاغب (مقطع متوسط" ساكن+ حركة +ساكن") الأربعاء: سيارة نقل الحرف زاى الخميس: تعرف عدد المقاطع باستخدام التصفيق	الأحد: دعنا نتظاهر :الحرف سين الاثنين: تعرف عدد المقاطع باستخدام لعبة سقوط الذقن الثلاثاء : سيارة نقل الحرف شين الأربعاء : تصنيف الصور وفقا لعدد المقاطع (لعبة البحث عن مشابه) الخميس: دعنا نتظاهر :الحرف عين
الأسبوع التاسع : مقاطع وحروف	**الأسبوع العاشر: مقاطع وحروف**
الأحد: تصنيف الصور وفقا لعدد المقاطع (لعبة البحث عن مشابه) الاثنين: سيارة نقل الحرف غين الثلاثاء دمج المقاطع باستخدام لعبة ماذا فى الصندوق الأربعاء: دعنا نتظاهر :الحرف فاء الخميس: دمج المقاطع باستخدام لعبة ماذا فى الصندوق	الأحد: سيارة نقل الحرف لام الاثنين: دمج المقاطع باستخدام لعبة ناول واجلس الثلاثاء: دعنا نتظاهر :الحرف هاء الأربعاء: دمج المقاطع باستخدام لعبة ناول واجلس الخميس: سيارة نقل الحرف ياء
الأسبوع الحادى عشر: مقاطع وحروف	**الأسبوع الثانى عشر : مقاطع وحروف**
الأحد: تقسيم الكلمات إلى مقاطع باستخدام لعبة القفز الاثنين: سيارة نقل الحرف ثاء الثلاثاء: تقسيم المقاطع باستخدام الفيشات الأربعاء: دعنا نتظاهر :الحرف ذال الخميس: تقسيم المقاطع باستخدام الفيشات	الأحد: سيارة نقل الحرف صاد الاثنين: تقسيم الكلمات إلى مقاطع باستخدام أصابع اليد الثلاثاء: دعنا نتظاهر :الحرف ضاد الأربعاء: تقسيم الكلمات إلى مقاطع باستخدام أصابع اليد الخميس: سيارة نقل الحرف طاء
الأسبوع الثالث عشر : حروف	
الأحد: دعنا نتظاهر :الحرف ظاء	

Appendix (11)
Teacher guide of the treatment program (Example)

تعرف الكلمات المقفاة :لعبة البحث عن مشابه

المعالم التدريسية	ماذا تفعل	الإجراءات التدريسية
قدم النشاط	عرض بطاقات الصور على التلاميذ، وتسميتها لهم.	يعرض المعلم على التلاميذ عددا من الصور المتفقة فى القافية صور أرقام (22- 180- 126- 11) (95- 150- 135). ثم يسأل التلاميذ: ما الذى تلاحظونه فى هذه الصور؟ (يناقش المعلم التلاميذ ليصل معهم إلى أن هذه الكلمات تتفق فى الصوت الأخير، لذا تسمى بالصور المتفقة فى القافية) المعلم : لاحظوا معى أن هذه الكلمات تنتهى بصوت واحد ، والكلمات التى تنتهى بصوت واحد تسمى متفقة فى القافية. والآن سلعب لعبة سأعرض عليكم صورة لكلمة ، ثم أعرض بعدها صورتين أخريين وعليكم أن تحددوا أى الكلمتين تتفق مع الكلمة الأولى فى القافية.
صمم أمثلة نموذجية	صمم نماذج لمثالين	المعلم: سأبدأ أولا يختار المعلم إحدى الصور ويقول : علم (119) ثم يعرض المعلم صورتين بعد ذلك كرة (153) ، قلم (141) ثم يسأل : أى الصورتين تتفق مع علم فى القافية ، وينطق علم –كرة ، علم – قلم . المعلم : نعم علم وقلم تتفقان فى القافية. دعونا نجرب ذلك مرة أخرى يختار المعلم صورة أخرى ويقول : رأس (72) ثم يعرض المعلم صورتين بعد ذلك فأس (135) ، مسجد (166) ثم يسأل : أى الصورتين تتفق مع رأس فى القافية ، وينطق رأس – فأس ، رأس – مسجد. المعلم : نعم رأس وفأس تتفقان فى القافية
قدم فرصا للتلاميذ	اتح الفرصة للتلاميذ للتعرف على الكلمات المتفقة فى القافية فى بقية النشاط.	المعلم: الآن جاء دوركم (يعرض المعلم عليهم صورة ذهب (64) ثم يعرض صورتين بعد ذلك أذن (4) ، عنب (125) ثم يسأل : أى الصورتين تتفق مع ذهب فى القافية ؟ يحاول كل الاطفال تحديد أى الصورتين تتفق مع ذهب فى القافية، ثم يختار المعلم أحدهم ليجيب. يستمر المعلم مع بقية التلاميذ فى الصف (على أن يتم اخيار كل طفل مرة على الأقل. الصور المستخدمة أرقام : (153- 10- 21) (44- 23- 72) (140- 181- 1) (22- 33- 106) (21- 26- 4) (148- 48- 65) (163- 47- 13) (108- 72- 23) (28- 31- 53) (126- 130- 26)

المعالم التدريسية	ماذا تفعل	الإجراءات التدريسية
تقييم مستمر وتغذية راجعة	قدم تغذية راجعة أثناء التدريبات ، قدم نموذجا للاستجابة الصحيحة ، وراجع العنصر مرتين على الاقل أو حتى يتأكد التلاميذ من الستجابة الصحيحة	يقدم المعلم تغذية مرتجعة فى التعرف على الصور أولا، فعند عرض بطاقة شراع يسأل المعلم ما هذا؟ التلاميذ: شراع ، المعلم نعم شراع. يقدم المعلم تغذية مرتجعة فى التعرف على الصورالمتفقة فى القافية، فعند عرض بطاقة درج، ثم برج ولبن يسال المعلم أى الصورتين تتفق مع درج فى القافية فإذا أجاب التلاميذ ب (لبن)ة قال لهم المعلم :لا اسمعوا معى مرة أخرى: درج—برج، درج ---لبن أى الكلمتين تتفقان فى القافية، فإذا أجاب التلاميذ ب (برج) قال المعلم نعم درج - -- وبرج تتفقان فى القافية

تعرف القافية: ذاكرة القافية

المعالم التدريسية	ماذا تفعل	الإجراءات التدريسية
قدم النشاط	عرض بطاقات الصور على التلاميذ ، ويسميها لهم المعلم واحدة بعد الأخرى ،	سنلعب اليوم لعبة تساعدنا على تعرف الكلمات التى تشبه فى قافيتها صورا أخرى، سيجلس أفراد المجموعة فى دائرة ، سأعطى كل تلميذ فى اللعبة ثلاث بطاقات ، وعلى كل منكم أن يسحب بطاقة من زميله الذى بجواره (بعد أن اختار التلميذ الأول) وينظر إذا ما كانت الصورة التى فى هذه البطاقة تتفق مع صور أخرى فى القافية فيخرج الصورتين وينطق اسمهما ، ويضعهما فى منتصف المنضدة ، وإذا لم تكن متفقة مع اى من البطاقات التى معه فى القافيةيقول مرور ولا يفعل شيئا ، ويسحب منه الذى بجواره بطاقة وهكذا ، والفائز: أول تلميذ ليس معه بطاقات.
صمم أمثلة نموذجية	صمم نموذجا مثاليا (يجلس المعلم مع المجموعة الأولى من التلاميذ ، ويعرض لهم كيفية اللعب)	المعلم: سأبدأ أولا ويجلس المعلم المجموعة الأولى ويسحب من الطفل الأول بطاقة ، ويقول خيار وينظر فى بطاقاته وهو ينطق الكلمة ثم يُخرج بطاقة صورة خمار ويقول نعم خيار وخمار ذات قافية واحدة ويضع البطاقتين فى وسط المنضدة ، ثم يطلب المعلم من التلميذ التالى أن يفعل كما فعل ، وهكذا.

المعالم التدريسية	ماذا تفعل	الإجراءات التدريسية
قدم فرصا للتلاميذ	اتح الفرصة للتلاميذ للعب واستخراج البطاقات ذات القافية الواحدة.	المعلم: الآن جاء دوركم (ويتيح المعلم الفرصة للتلاميذ للعب من خلال جلوسهم فى دائرة ويبدأ التليمذ الأول يسحب بطاقة من زميله الذى بجواره (بعد أن يختار المعلم التلميذ الأول) وينظر إذا ما كانت الصورة التى فى هذه البطاقة تشبه فى قافيتها صورا أخرى فيخرج الصورتين وينطق اسمهما ، ويضعهما فى منتصف المنضدة ، وإذا لم تكن متفقة مع أى من البطاقات التى معه فى قافيتها لا يفعل شيئا ، ويسحب منه الذى بجواره بطاقة وهكذا . ثم بقية المجموعات . أرقام بطاقات الصور المستخدمة: 195: 242.
تقييم مستمر وتغذية راجعة	قدم تغذية راجعة أثناء التدريبات ، قدم نموذجا للاستجابة الصحيحة ، وراجع العنصر مرتين على الاقل أو حتى يتأكد التلاميذ من الستجابة الصحيحة	المعلم : جيد أحمد نعم لسان ورمان تتفقان فى القافية. لو أخرج تلميذ بطاقتين غير صحيحتين ، قال المعلم : لا باب لاتشبه فى قافيتها لسان ، لاحظ لسان--- باب وبكرر المعلم ذلك مع التركيز فى نطقه على قافية الكلمتين، ثم يقول للتلميذ والآن حاول أنت ، ما الكلمة الأولى ؟ لسان ، ما الكلمة الثانية ؟ باب ، هل لسان وباب لهما نفس القافية؟

تعرف القافية: ذاكرة القافية

المعالم التدريسية	ماذا تفعل	الإجراءات التدريسية
قدم النشاط	عرض بطاقات الصور على التلاميذ ، ويسميها لهم المعلم واحدة بعد الأخرى	سنلعب اليوم لعبة تساعدنا على تعرف الكلمات التى تشبه فى قافيتها صورا أخرى، سيجلس أفراد المجموعة فى دائرة ، سأعطى كل تلميذ فى اللعبة ثلاث بطاقات ، وعلى كل منكم أن يسحب بطاقة من زميله الذى بجواره (بعد أن اختار التلميذ الأول) وينظر إذا ما كانت الصورة التى فى هذه البطاقة تتفق مع صورا أخرى فى القافية فيخرج الصورتين وينطق اسمهما ، ويضعهما فى منتصف المنضدة ، وإذا لم تكن متفقة مع اى من البطاقات التى معه فى القافيةيقول مرور ولا يفعل شيئا ، ويسحب منه الذى بجواره بطاقة وهكذا ، والفائز: أول تلميذ ليس معه بطاقات.

المعالم التدريسية	ماذا تفعل	الإجراءات التدريسية
صمم أمثلة نموذجية	صمم نموذجا مثاليا (يجلس المعلم مع المجموعة الأولى من التلاميذ ، ويعرض لهم كيفية اللعب) .	المعلم: سأبدأ أولا ويجلس المعلم المجموعة الأولى ويسحب من الطفل الأول بطاقة ، ويقول خيار وينظر فى بطاقاته وهو ينطق الكلمة ثم يُخرج بطاقة صورة خمار ويقول نعم خيار وخمار ذات قافية واحدة ويضع البطاقتين فى وسط المنضدة ، ثم يطلب المعلم من التلميذ التالى أن يفعل كما فعل ، وهكذا.
قدم فرصا للتلاميذ	اتح الفرصة للتلاميذ للعب واستخراج البطاقات ذات القافية الواحدة.	المعلم: الآن جاء دوركم (ويتيح المعلم الفرصة للتلاميذ للعب من خلال جلوسهم فى دائرة ويبدأ التليمذ الأول يسحب بطاقة من زميله الذى بجواره (بعد أن يختار المعلم التلميذ الأول) وينظر إذا ما كانت الصورة التى فى هذه البطاقة تشبه فى قافيتها صورا أخرى فيخرج الصورتين وينطق اسمهما ، ويضعهما فى منتصف المنضدة ، وإذا لم تكن متفقة مع أى من البطاقات التى معه فى قافيتها لا يفعل شيئا ، ويسحب منه الذى بجواره بطاقة وهكذا . ثم بقية المجموعات . أرقام بطاقات الصور المستخدمة: 195: 242.
تقييم مستمر وتغذية راجعة	قدم تغذية راجعة أثناء التدريبات ، قدم نموذجا للاستجابة الصحيحة ، وراجع العنصر مرتين على الاقل أو حتى يتأكد التلاميذ من الستجابة الصحيحة	المعلم : جيد أحمد نعم لسان ورمان تتفقان فى القافية. لو أخرج تلميذ بطاقتين غير صحيحتين ، قال المعلم : لا باب لاتشبه فى قافيتها لسان ، لاحظ لسان--- باب وبكرر المعلم ذلك مع التركيز فى نطقه على قافية الكلمتين، ثم يقول للتلميذ والآن حاول أنت ، ما الكلمة الأولى ؟ لسان ، ما الكلمة الثانية ؟ باب ، هل لسان وباب لهما نفس القافية؟

Appendix (12)
Phoneme-grapheme correspondence cards (*Examples*)

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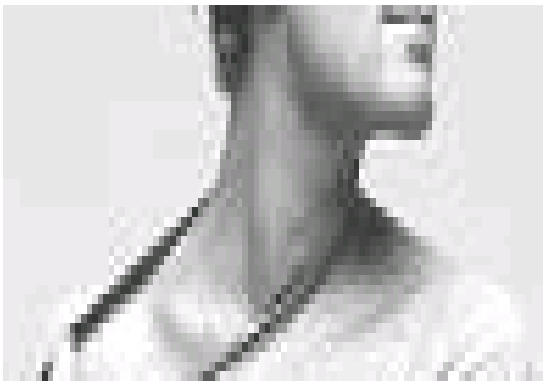

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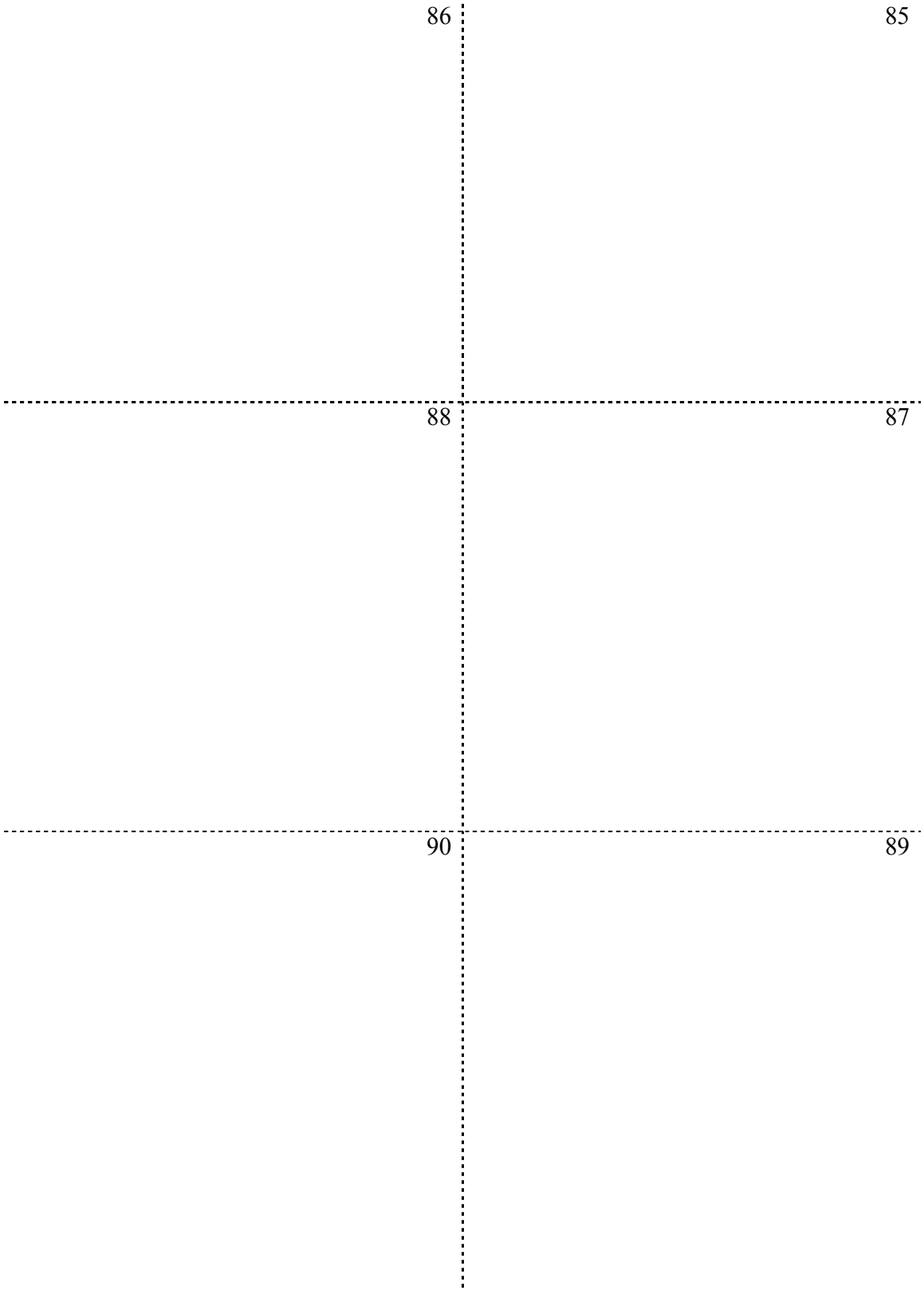
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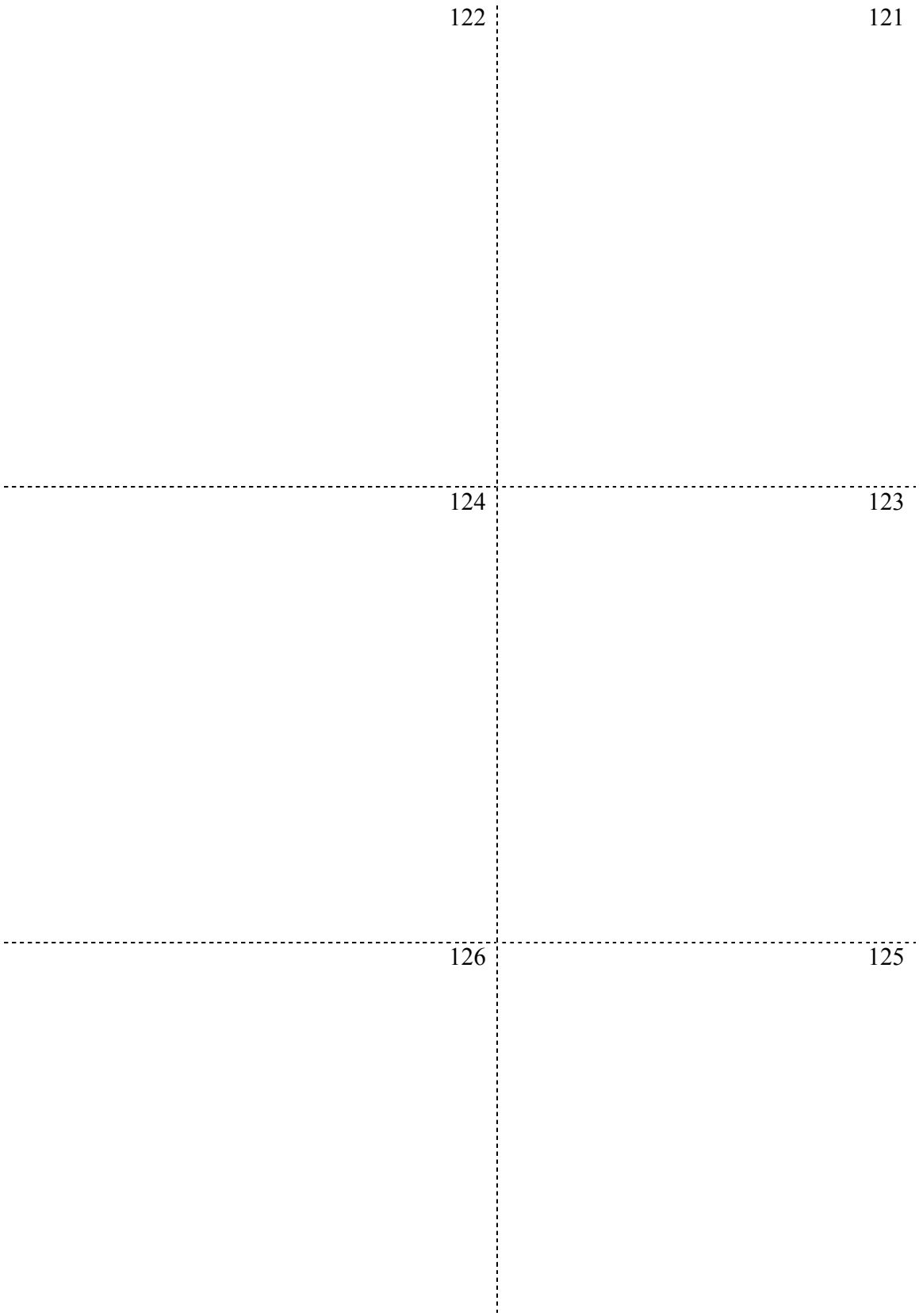
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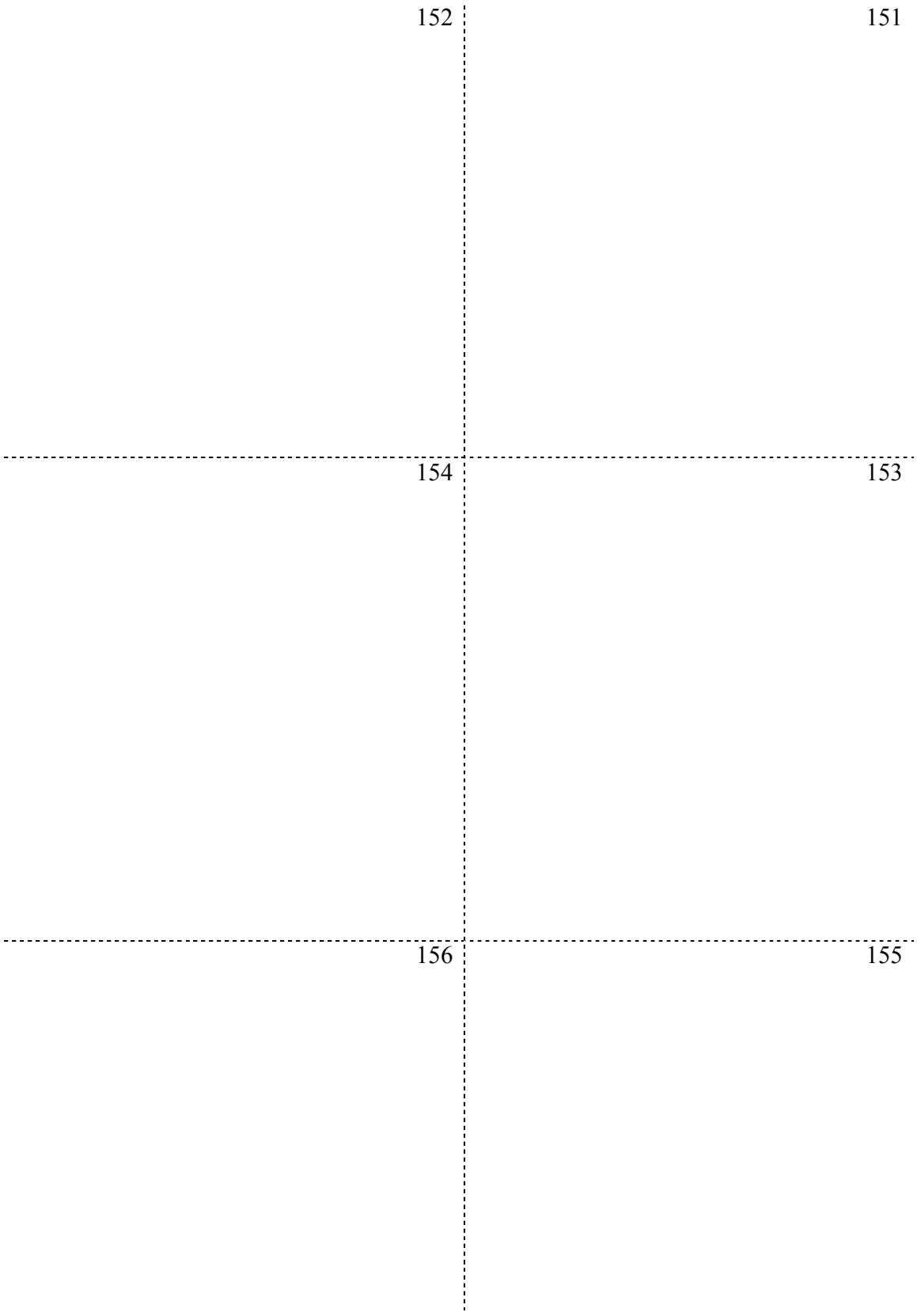
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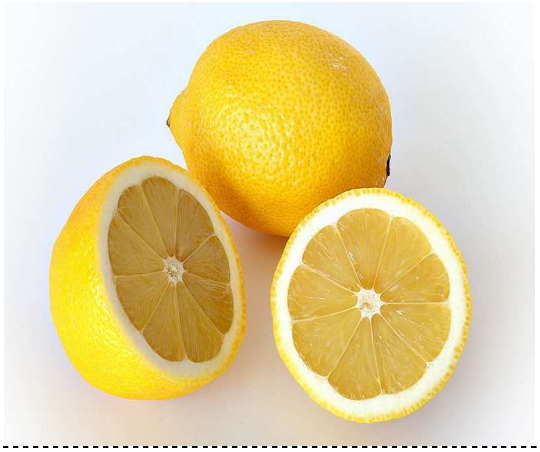

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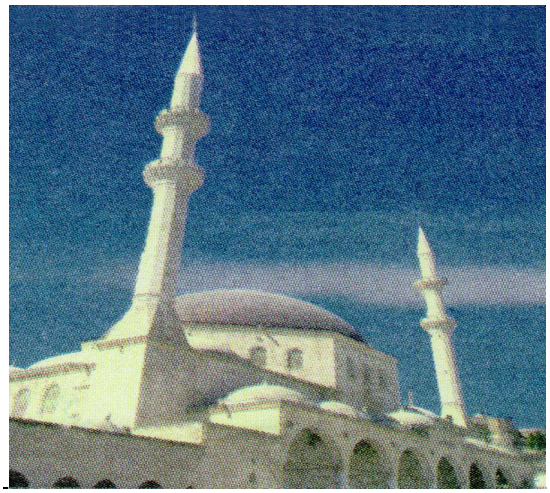

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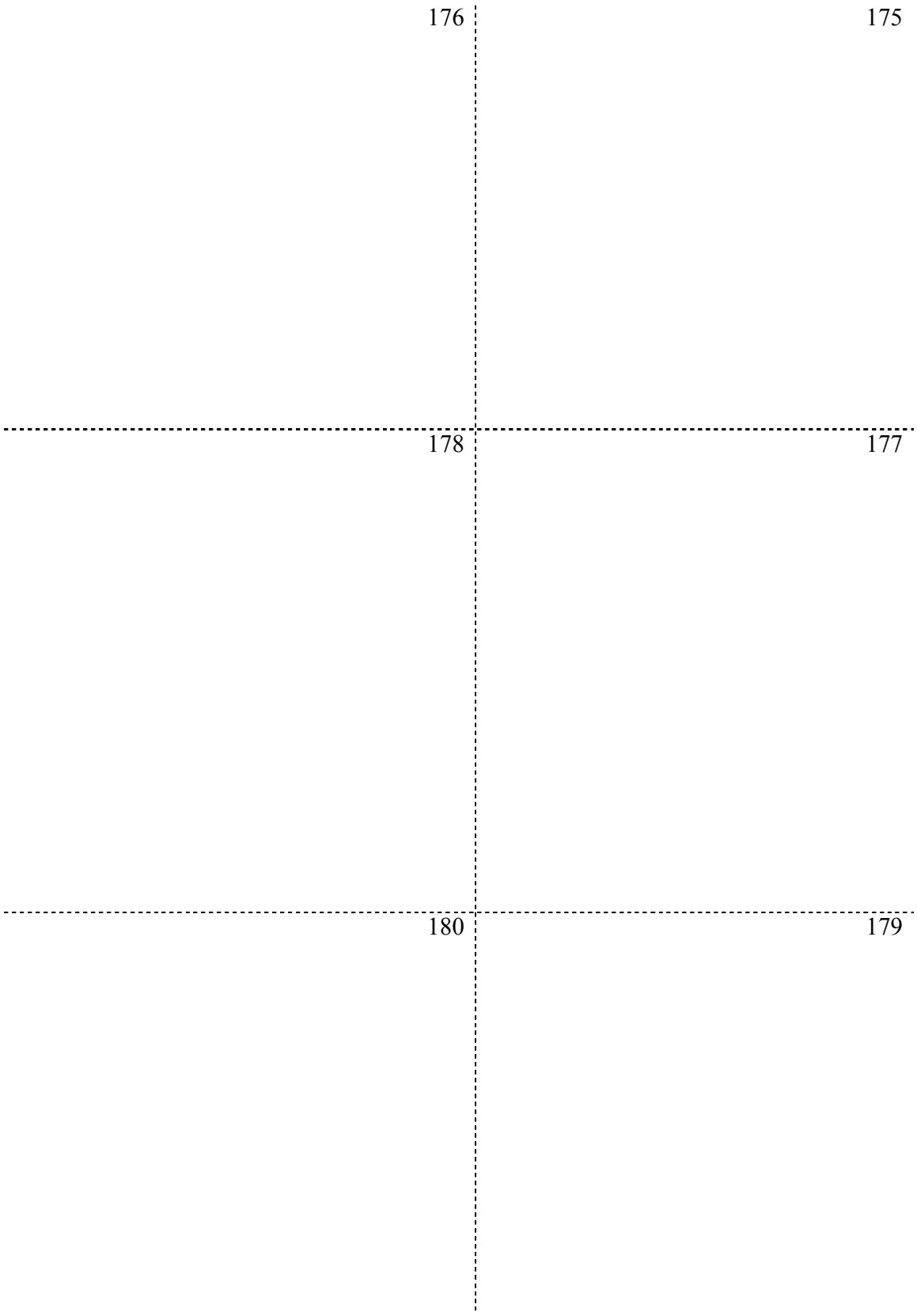
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Appendix (13)
Rhyme cards (*Examples*)

198	197	196	195 
202	201 	200	199
206	205	204 	203
210 	209	208	207
214	213 	212 	211

218 	217	216 	215
222	221 	220	219
226	225	224 	223
230	229	228 	227
234	233 	232	231
238	237 	236	235

Appendix (14)
Syllables identification cards (Examples)

242	241	240 	239
246	245 	244	243 
250 	249	248	247
254	253 	252	251
258	257	256	255 
262	261 	260	259
266	265	264 	263

270	269	268 	267
274 	273	272	271 
278	277	276 	275
282	281 	280	279
286	285	284 	283
290	289	288	287 
294 	293 	292	291

298	297 	296	295
302 	301	300	299 
306 	305	304	303
310	309	308 	307
314	313	312	311 
318	317 	316	315
322 	321	320	319 

Appendix (15)
Sentences and letters cards

323

صلى أحمد

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صام أنس

325

سافر خالد

326

المدرسة جميلة

327

جاء عمر

328

قام عثمان

329

محمد نشيط

330

أذن الصبح

331

نام كريم

332

نزل المطر

333
قرأ أحمد القرآن

334
شرب أحمد اللبن

335
صافح المعلم محمدا

336
حضر أنس الدرس

337
صلى على العصر

338
ذهب أنس إلى المسجد

339
يعمل الفلاح فى الحقل

340
قرأ عمر كتابا جديدا

341
صلاة العصر أربع ركعات

342
صام المسلم شهر رمضان

343 أ	344 أَ	345 أُ	346 إِ
347 ب	348 بَ	349 بُ	350 بِ
351 ت	352 تَ	353 تُ	354 تِ
355 ث	356 ثَ	357 ثُ	358 ثِ
359 ج	360 جَ	361 جُ	362 جِ
363 ح	364 حَ	365 حُ	366 حِ

367 خ	368 خَ	369 خُ	370 خِ
371 د	372 دَ	373 دُ	374 دِ
375 ذ	376 ذَ	377 ذُ	378 ذِ
379 ر	380 رَ	381 رُ	382 رِ
383 ز	384 زَ	385 زُ	386 زِ
387 س	388 سَ	389 سُ	390 سِ
391 ش	392 شَ	393 شُ	394 شِ

395 ص	396 صَ	397 صُ	398 صِ
399 ض	400 ضَ	401 ضُ	402 ضِ
403 ط	404 طَ	405 طُ	406 طِ
407 ظ	408 ظَ	409 ظُ	410 ظِ
411 ع	412 عَ	413 عُ	414 عِ
415 غ	416 غَ	417 غُ	418 غِ
419 ف	420 فَ	421 فُ	422 فِ

423 ق	424 قَ	425 قُ	426 قِ
427 ك	428 كَ	429 كُ	430 كِ
431 ل	432 لَ	433 لُ	434 لِ
435 م	436 مَ	437 مُ	438 مِ
439 ن	440 نَ	441 نُ	442 نِ
443 ه	444 هَ	445 هُ	446 هِ
447 و	448 وَ	449 وُ	450 وِ
451 ى	452 ىَ	453 ىُ	454 ىِ

Appendix (16)
Cards names of the treatment program (example)

أسماء بطاقات صور البرنامج العلاجى وأرقامها

1- أسد.	-2	-3	-4	-5
-6	-7	-8	-9	-10
-11	-12	13-برج.	-14	-15
-16.	-17	-18	19-تمر.	-20
-21	-22	-23	-24	-25
-26	-27	28-ثوب.	-29	-30
-31	-32	-33	-34	35-جزر.
-36	-37	-38	-39	-40
-41	42-حبل.	-43	-44	-45
-46	47-حصان.	-48	-49	50-خروف.
-51	-52	-53	-54	-55
-56	-57	58-دواء.	59- .	-60
-61	-62	-63	64-ذهب.	-65
-66	-67	-68	-69	70-رقبة.
-71	-72	-73	-74	-75
-76	-77	78-زيت.	-79	-80
-81	-82	-83	84-ساعة.	-85
-86	-87	-88	-89	-90
-91	-92	93-شجرة.	-94	-95
-96	-97	-98	99-صقر.	-100
-101	-102	-103	-104	105- ضابط.
-106	-107	-108	-109	110- طاووس.
-111	-112	-113	114- ظرف.	-115
-116	-117	-118	119- علم.	-120
-121	-122	-123	-124	-125
-126	127- غزال.	-128	-129	-130
-131	-132	133- فراشة.	-134	-135
-136	-137	-138	-139	-140
141- قلم.	-142	-143	-144	-145
-146	-147	-148	149- كعبة.	-150
-151	-152	-153	-154	-155
-156	-157	158- ليمون.	-159	-160
-161	-162	-163	-164	-165
166- مسجد.	-167	-168	-169	-170
-171	-172	-173	174- نخلة.	-175
-176	-177	-178	-179	-180
-181	-182	-183	-184	-185
186- ورقة.	-187	-188	-189	-190
-191	-192	-193	-194	

تصنيف بطاقات البرنامج العلاجى وفقا لنوع وعدد المقاطع

CV"s"+CV +CVC	CV"L"+CV+CVC		VC"S"+CV" L"+CVC			4
	2	3		2	3	
-1	-11	-15	-22 تراب	-13 برج	-10	-7
-4.	-20	-43	-32	-19 تمر	-2	-41
-35	-23	-52	-33 ثيلب	-28	-3	-60
-36	-24	-76	-34	-29	-6 أصبع	- 80
-37	-44	-83	-46	-31	-8	-90
-64	-89	-84	-47	-38	-9	- 92
-67 ذرة	- 102	- 100	-48	-40	-14	- 128
-119	-112	-103	-49	-42	-17	12 - بقرة
-125 عنب	-136	-105	-50	-51 خس	-25	- 70
-141	-140 فيل	-110	-54	-53	-26	- 93
-142	-181	-160	-55	-59	-21	- 16
-153		-182	-56.	-61	-27	-186
-154			-57 خمار	-62	-30	- 168
-157			-58	-65	-39	- 170
-176			-63 دهان	-69	-45	- 88
			-66	-71	-73	-123
			-68	-72	-73	-192
			-77	-75	-79	-193
			-82	-78	-87	-194
			-86	-81	-94	
			-97	-95 شمس	-96	
			-98	-99	-101 .	
			-109	-108	-106 .	
			-121	-113	-124	
			-130	-114 ظرف	-126	
			-127	-115 ظبى	-131 غربال	
			-133	-116	-137	
			-148	-117	-138	
			-155	-118	-134	
			-163	-120	-144	
			-164	-122	-146	
			-177	-129	-149	
			-178	-134	-152	
			-180	-135	-158	
			-183	-139	-159	
			-185	-145	-161	
			-188	-147	-166	
			-189	-150	-167	
			-18	-151	-169	
			-156	-162	-172	
				-165	-173	
				-191	-174	
					-175	
					-179	
					-184	
					-187	

Appendix (17)
Syllables account cards names (example)

عدد مقاطع الكلمات					
مقطعين		ثلاثة مقاطع			أربعة مقاطع
5 –	140 - فيل	-1	74 -	156 -	7 -
11 -	145 -	2 -	76 -	157 -	12 - بقرة
13 - برج	95 -	3 -	77 -	158 -	16 -
19 - تمر	147 -	4 -	79 -	159 -	41 -
20 -	150 -	6 - أصبع	82 -	160 -	60 -
23 -	151 -	8 -	83 -	161 -	66 -
24 - .	162 -	9 -	84 -	163 -	70 -
28 -	165 -	10 -	86 -	164 -	80 -
29 -	181 -	14 -	87 -	166 -	88 -
31 -	191 -	15 -	94 -	169 -	90 -
38 -		17 -	146 -	171 -	91 -
40 -		18 -	96 -	172 -	92 -
42 -		21 -	97 -	173 -	93 -
44 -		22 - تراب.	98 -	174 -	104 -
51 - خس		25 -	100 -	175 -	111 -
53 -		26 -	101	176 -	123 -
59 -		27 -	103	177 -	128 -
61 -		30 -	105 -	178 -	133 -
62 -		32 -	106 -	179 -	168 -
69 -		33 -	107 -	180 - نقاب	170 -
71 -		34 -	109 -	182 -	183 -
72 -		35 -	110 -	184 -	186 -
75 -		36 -	119 -	185 -	190 -
78 -		37 -	121 -	187 -	
81 -		39 -	124 -	188 -	
85 -		43 -	125 - عنب	189 -	
89 -		45 -	126 -		
99 -		46 -	127 -		
102 -		47 -	130 -		
108 -		48 -	131 -		
112 -		49 -	132 -		
113 -		50 -	137 -		
114 - ظرف		52 -	138 -		
115 -		54 -	141 -		
116 - ظهر		55 -	142 -		
117 -		56 -	143 -		
118 -		57 - خمار	144 -		
120 -		58 -	146 -		
112 -		63 -	148 -		
129 -		64 -	149 -		
1134 -		65 -	152 -		
135 -		67 -	153 -		
136 -		68 -	154 -		
139 -		73 -	155 -		