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EFFECTS OF A PROGRAM FOR STIMULATING PHONETIC AND PHONOLOGICAL AWARNESS IN PRESCHOOLERS

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ABSTRACT

The purpose of this study is to examine the effect of an integrative program of phonetic and phonological training on the phonetic and phonological awareness of preschool children. The level of phonetic and phonological awareness of 34 children was pre and post-measured with the help of a) an articulation test created for the purposes of the study and b) a screening measure for their phonological development. Between the two measurements the experimental group followed an integrative program of phonetic and phonological training which lasted for five weeks while the control group followed the normal curriculum. The post-measurement showed no significant differences in the phonetic and phonological awareness of the two groups.

Keywords: phonological awarness, phonetic awarness, program, preschool children

1. Introduction

Phonological awareness has gained much attention over the past two decades and a number of definitions have been proposed for the term (Stanovich 1986, Yopp 1988, Tunmer 1991, Blachman, Ball, Black & Tangel 1994, Gough Larson & Yopp 1996, Τάφα 1998, Γιαννικοπούλου & Ομάδα Εργασίας 1999, Παπούλια-Τζελέπη 1997 1999, Πόρποδας 2002, Gavriilidou 2003 *Phonetic awareness and correction for children preschool and early school years. in Greek*). These researches can be classified in the following three major areas: Some of them focus primarily on the contribution of phonological awareness to reading acquisition (Stanovich 1986, O' Connor, Jenkins & Slocum 1995, Παπούλια-Τζελέπη 1997). Others emphasize the diachronic development of childrens' phonological awareness (Olofsson & Lundberg 1983 1985, Stanovich, Cunningham & Cramer 1984). Finally, a third category studies the early phonological development of children (Lundberg, Frost & Petersen 1988, Byrne et al. 1991, Brady, Fowler, Stone & Winbury 1994, QI, O'Connor 2000, Phillips, Clancy-Menchetti & Lonigan 2008). According to Snow, Burns & Griffin (1998: 51), the term 'phonological awareness' refers to a general appreciation of the sounds of speech as distinct from their meaning. When that insight includes an understanding that words can be divided into a sequence of phonemes, this finer-grained sensitivity is termed phonemic awareness. Furthermore, phonological awareness involves the auditory and oral manipulation of sounds.

Children develop the speech ability until preschool age but with different rhythms and ways. However up to the age of five years each child has conquered the complex system of the oral speech in his/her maternal language with a worldwide common process (Slobin 1992). Previous research for Greek language (Κατή 1992, Θωμαδάκη & Μαγούλα 1997, Gavriilidou & Kambakis-Vougiouklis 2011) and for other languages (Stoel-Gammon & Dunn 1985, Ingram 1989) has shown that children's speech development is based on three aspects: a) how a sound is stored in children's brain b) how sounds are articulated by children and c) the rules and the processes that intervene between "a" and "b"(Gavriilidou 2003). How the sound is stored in children's brain is related to their phonological awareness. On the other hand sound articulation is related to phonetic acquisition.

By *phonetic acquisition* we refer to the articulation of sounds. Phonetic acquisition requires the kinesthetic maturation of the articulator muscles but also the awareness of the place of articulation and the manner in which they are articulated (Gavriilidou 2003:74).

It is obvious that if one of the two functions is not completed, children will commit phonological or phonetic errors (Γαβριηλίδου 2002). Such errors severly influence children's further developement (Βογινδρούκας κ.ά. 2004). On the contrary, the development of language skills contributes to better

school performance and reading or learning difficulty avoidance (Lundberg et al. 1988, Byrne et al. 1991, Ball et al. 1991, Torgesen et al. 1992, Brady et al. 1994, Share 1995).

Phonological awareness, as happens with other decoding skills, is not an intuitive or naturally developed ability, as language skills may be for some children, but rather may require deliberate teaching and practice opportunities (Phillips et al. 2008).

As it has been demonstrated phonetic and phonological awareness can be raised through integrative phonetic-phonological programs held during preschool age (Porpodas 2002) or early school years. These programs should be adjusted in the school's daily practices and should include concise, playful activities which would be attractive for the pupils in order to keep children's attention and interest (Παντελιάδου 2000).

Most of the programs suggest systematic and precise activities for the phonemes, exercises for phonological treatment and exercises that introduce the equivalence between letter (grapheme) and sound (phoneme) which helps children improve their phonological awareness. The most common activities that some programs[1] suggest are related to:

- ✓ blending words at phoneme level,
- ✓ segmenting words at phoneme level,
- ✓ identifying sounds,
- ✓ rhymes,
- ✓ blending words at syllable level,
- ✓ segmenting words at syllable level.
- ✓ alliteration,
- ✓ phoneme detection,
- ✓ sound repetition
- ✓ letter - sound correspondence

Despite the promising findings, however, many questions remain unanswered, and many misconceptions about phonological awareness persist. For example, researchers are looking for ways to determine how much and what type of instruction is necessary and for whom. The purpose of the present study is to examine the effect of an integrative program of phonetic and phonological training on the phonetic and phonological awareness of preschool children

2. Method

2.1 Participants

The sample of our research included 34 children, 13 were boys and 21 were girls. When the investigation started they were all 5 to 6 years old[2]. The children were divided in two groups, the control group (N=17) and the experimental group (N=17). The purpose of this division was to have as equal number of girls and boys as possible. Therefore the control group included 7 boys and 10 girls and the experimental group had 6 boys and 11 girls. Children from both groups were attending in the same kindergarten but in 2 different classes, in a town of the province of Kavala called Eleftheroupoli. All children were Greek native speakers and none of them had serious speech disorders.

2.2 Instumentation and design

In January all children in both groups were pretested with an articulation test in order to evaluate children's speech level. The articulation test is presented in the paragraph 2.2. After the pre-test, children in the experimental group were daily trained according to a suggested program for 15-20

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[1] These programs are suggested from: Adams et al. (1998b), Bryant et al. (1990), David - Dickson (1999), Sharon QI & O'Connor R (2000).

[2] In Greek pedagogical system, the one year of kindergarten when children are 5 years old is obligatory, although they can attend kindergarten from 4 years old. Thus, children from 5-6 are called preschoolers and children from 4-5 are called "young preschoolers".

minutes. The control group followed the regular school program according to the analytic program of study of the Greek kindergarten (Αναλυτικό πρόγραμμα σπουδών/ ΑΠΣ). The proccedure lasted four months and at the end of May both groups were post-tested with the same evaluation test as in pretest.

2.3 Articulation Test

In order to collect information for the articulation level of the participants an articulation test was created.

The articulation test included all seventeen consonants of the Greek language, the allophones from [x], [l], [ɣ], [k][3]and the clusters [vr] [vl] [kr] [kl] [dr] [dz] [tr] [br] [xt] [b] [g] [d]. We chose these Greek clusters because they were included in every day interaction vocabulary at kindergarten. Thus it was easy to depict these every day words with pictures.

Thirty four cards with pictures were used to test the articulation of the sounds at the beginning of a word and thirty four more cards were used to test the same sounds in the middle of the word. The majority of the cards were taken from the pedagogical tool named *Πινακωτή* (Μπεζέ et al. 2002) and some of them from the Goldman and Fristoe test of articulation (Goldman, Fristoe2000). Children were acquainted to the cards prior to the realization of the articulation test. That helped them to be aware of the vocabulary and concentrate only on the pronunciation of the words.

During the pretest and post-test all children were recorded and the data was saved in digital form.

2.4 Training Program

The training program was constructed according to the five principles suggested in Gavriilidou (2003). These five principles included:

a.   Errors correction according to functional system of the sounds,
b.   Corretion of one problematic sound at a time,
c.   Correction through phonological oppositions[4], always placed in the word,
d.   Consideration of the phoneme position in word,
e.   Use of phonological games and enjoyable activities in order to raise awareness and correct problematc sounds .

Moreover, one of the basic criteria of the construction of the training program was the holistic approach of language (Αϊδίνης, 2002), who suggests a teaching model where children come in contact with the written speech in an environment full of literacy. Finally, the training program was created according to the regular preschool program and according to the cross thematic curriculum framework (Διαθεματικό Ενιαίο Πλαίσιο Προγραμμάτων Σπουδών/ ΔΕΠΠΣ) and the analytic program of study (Αναλυτικό πρόγραμμα σπουδών/ ΑΠΣ) of the Greek kindergarten.

In the pretest measure it was observed that preschoolers had difficulties in articulating the following phonemes:

[ð], [r], [ks], [θ], [l]

The phoneme [ð]was articulated as [z]
The [r] as [o]
The [ks], as [ts]
The [θ], as [s] and
The [l] as [j]

Thus the activities of the program focused on these five phonemes. The training program included daily session for 15-20 minutes and lasted for five weeks. Table 1 presents the activities of the program step by step.

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[3] Respectively their allophones are the [χ] [ʎ] [j] [c].

[4]*Oppositions of sounds capable to differentiating the lexical meaning of two words in a particular language are phonological oppositions. They are clasified in Multilateral, Biolatelal, Isolated and Proporsional oppositions* (Trubetzkiy 1969).

1st week	**1. The lucky hat:** preschoolers sit in a circle one by one and wear a hat. When the music stops the child who wears the hat has to say his/her name and a word starting with the same phoneme. There is a good opportunity to get to know each other as some of them are new in the group.
	2. Learn the articulators: watch them in a mirror and name them **3. Mustache of pencil :** hold a pencil among the nose and the upper lips
	4. Playing with chocolate hazelnut spread: Place the chocolate hazelnut spread in the children's front upper and lower teeth, palate, left and right inside cheek and let them lick it.
	5. The anteater: children try to eat small pieces of fruit etc without using their hands.
	6. Vacuum cleaner: Children are divided in two groups. Each child has a straw and tries to put as much pieces of papers in a bowl by inhaling.
2nd week	**7. Honey street:** Without using their hands they try to lick the honey
	8. Learning letters: Children are divided in five groups as much as the problematic phonemes. They are all sited in a circle and the music plays. When the music stops, teacher makes one of the five sounds. The corresponding group should stand up. In a higher level teacher can show cards with the letter instead of making the sound.
	9. The sweeper: Children sweep all kind of things that there are in the classroom starting with the target phonemes or including in the word.
	10. The burning ball: The teacher throws the ball and says a word. The child should find another word starting with the same phoneme and the rest of them count to ten. When he/she founds it throws the ball to another child and the game goes on.
	11. [ksaplono][ksopnao] [5]: When the teacher says words starting with: a) [ksi]-/Ξι/ ([ksiDi], [ksino], [ksinome] etc.) they pretend they wake up, b) [ksa] - /Ξα/ ([ksana], ksanarixno] etc.) they pretend they lay down.
3rd week	**12. I spy with my little eye:** child holds a telescope look at something and says the first sound of the word and the others tries to find it.
	13. Prison breaker syllables: Children say their names by clapping their hands or an instrument (each knot corresponds to a syllable). In the next level they have to do the same but by losing a syllable. The rest of the class tries to find which syllable is missing.
	14. Finger Theater: In the thumb children draw a figure and we place one of the target phonemes. On the other fingers we place the vowels. They make the combinations and they try to find words starting with each of them.
	15. Chinese: The teacher reads poems of the phonemes [r] and [l] from Παμπούδη(1981). Then they try all together to say the poems by replacing the [r] by [l] and vise versa.
	16. Lingo: Children try to place before each syllable the syllable [ksa] or [ra]
4th week	**17. The mischief of [kse]:** the teacher tells the story of a writer who was writing on a paper but the letters were unwritten[6]. At the end children try to continue with their own pairs of words (eg. gr: κουμπώνω-ξεκουμπώνω en: clasp-unclasp/ gr: χτενίζω-ξεχτενίζω en:comb)
	18. Pantomime: Five groups of children. Each group finds a word starting with the target phoneme. They try to explain the word with pantomime to other groups.
	19. Sound-treasure hunt: When the music stops children try to find things starting or including the phoneme that teacher says as fast as possible.
	20. What's in the basket: Children are divided in the group of [l] and in the group of [r]. There is a basket opposite the two groups which contains things that their words start with [l] and[r]. The group that will manage to collect the most things is the winner.
	21. Memo with Pinakoti: In this game a pair of the same cards is needed. The teacher places the pairs promiscuous on the floor and lets the children watch them for a few minutes. Then, turns the cards upside down and children try to find the pairs (all cards are related to the target phonemes).

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[5] /Ξαπλώνω/ en: lay dawn -/Ξυπνώ/ en: wake up. The phoneme [ks] corresponds to the Greek letter /Ξ/.

[6] The prefix "un" can be ascribed in Greek as "ξε" for example in English is "written"- "**un**written", in Greek "γραμμένος"- "**ξε**γραμμένος".

5th week	**22. Which letter am I?:** All children sat in a circle, place a sticker on their forehead with one of the letters of target phonemes. The letter has been chosen from the others. They are saying words starting with different sounds. When they will say the same sound with that in the sticker they win.
	23. Policemen: The teacher tells a story about the syllable thief and tells some words without one syllable and the children try to find them. Some words in Greek are: *κουβάγια* instead of **κουκουβάγια** *(en: owl), χανίζω/**χαχανίζω** (en: yawn), λούδι/ **λουλούδι** (en: flower) etc.*
	24. Cross the river: Children step on the rocks which are pictures. They select to step on the pictures that their word start or include the sound that the teacher has said.
	25. Words saying, music playing[7]: The child takes a card. Then tries to find another card which makes rhyme. The teacher can use some of the Pinakoti's card to facilitate the children.
	26. Chain: Two children are the start of the chain. Each one chooses one of the target phonemes and says a word starting with it. The others try to find one word starting with one or another phoneme. When a child finds a word says it out loud and runs to the chain of the sound that has been selected. Finally they count which chain has the most children to find the winner.

Table 1 List of the activities of the 5 weeks program

The program starts with an activity which offers the opportunity to the children to introduce themselves. Furthermore, it contributes to the creation of coherence and conditions of good cooperation between the group members. The rest of the program was covered with various types of activities in order to practice children's phonological and phonetic awareness. The second up to the seventh activity are all practicing and strengthening the articulator muscles and were repeated the second week as well. There were activities for teaching letter-sound correspondence (No 8, 21, and 22). There are also activities included for: identifying sounds (No 9, 10, 12, 15,18,19, 20, 26), rhymes (No 25), segmentation in syllable level (No 11,16, 17), deleting syllables (No 13, 23).

There are some activities which combine two or more types, like teaching letter-sound with creating a syllable (No 14) and teaching letter-sound with identifying sounds (No24).

Most of the activities are suggested by Giannikopoulou (1999) and Gavriilidou (2003:137-185) and they were adjusted to the daily regular program of a Greek public kindergarten. The activities were chosen with a view to be realized by large groups of children. In our case a whole class was taking place in contrast to most intervention phonological programs for preschoolers. Most of them were created to be applied to individual children or to small groups of children (Phillips et al. 2008). Furthermore, Phillips et al. (2008) mentions that the *majority of the studies have included explicit instructional strategies in which the teacher clearly explains, models, and supports children's initial practice with the tasks.* The present training program was presented to the children as daily game and as a small break from the other activities. Thus, the teacher introduces explicit strategies for the phonological and phonetic awareness.

3. Results

The analysis of the data was realized with the non parametric test Man-Whitney U. According to the statistical analysis there was no statistical significant difference in the articulation efforts between the first and the second measure of the experimental group (Table 2).

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[7]The title of this activity in Greek can be: *Κάνω μουσική με την πινακωτή.*

	Research Groups	N	Mean	Std. Deviation
s1T	control	17	32,12	2,736
	experimental	17	32,53	1,419
s2T	control	17	32,47	2,035
	experimental	17	33,06	,556

Table 2

As well, there was no statistical significant difference between the control and the experimental group in the second measure.

|	Research Groups	N	Mean	Std. Deviation
m1T	control	17	32,88	2,736
	experimental	17	33,35	1,539
m2T	control	17	33,06	2,358
	experimental	17	33,76	,562

Table 3

There was only an exception where a slight improvement was occurred in the experimental group between the preprogram measure and the post program measure. It seems that students articulated much better the phonemes and the clusters at the beginning of the word after the intervention program (Table 4 and Figure 1).

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
s1T	34	32,32	2,156	23	34
s2T	34	32,76	1,499	27	34
Research Groups	34	1,50	,508	1	2

Table 4
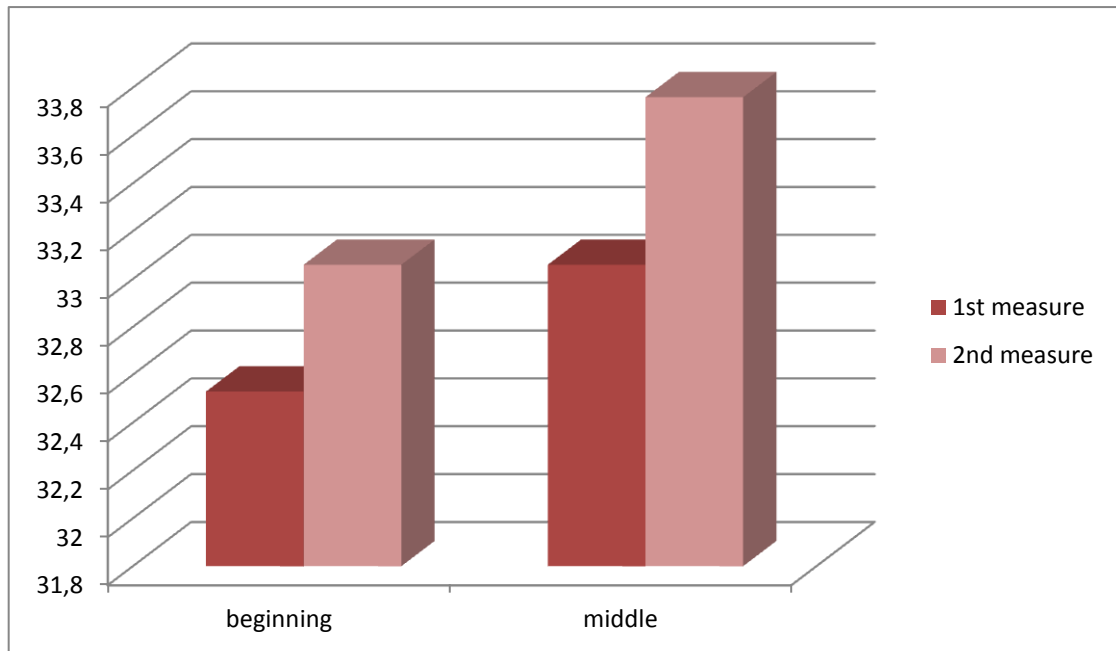
Figure 1 Slight improvement of the experimental group
at the first position phoneme and cluster articulation.

4.   Discussion

According to the results it is obvious that a training program can affect phonological and phonetic awareness. However, it could be suggested the time extension of the training program considering other training programs such as these of QI, O'Connor (2000) which lasted 10 weeks, Byrne & Barnsley (1991) which lasted 12 weeks and Lundberg et al (1988) which lasted 32 months. That premises the program's enrichment with new activities which should not be daily practiced by children in order to avoid possible undesirable results. Their no constant practice with the program activities may induce positive effects to all levels of phonetic and phonological awareness as they will have more time to absorb the phonetic and phonological skills.

The training program can be flexible and adjusted to the level of the children's phonetic and phonological awareness. The activities are conformed and give the opportunity to the teacher to correct different phonological errors according to the needs of every sample. That renders the training program a useful tool to the teachers. Although, there is no need for particular knowledge of the teacher in order to apply the suggested phonetic-phonological program in the classroom, he/she should be able to recognize the phonetic or the phonological errors. In no case, the program was not created to be a recipe for implementation. The final form that each educational program will take depends on many different factors such as the particular conditions of each school, the student's possibilities, the interests and the priorities of the teachers etc.

Finally, an important parameter that contributed to the no statistical significance of the data analysis could be a consequence of the finite sample. This parameter gives us the motivation to repeat the research and to redefine the results.

5.   Perspectives

Due to the lack of statistical significance, this study has to be repeated. Two important parameters that should be considered are the size of the sample and its representativeness. In addition, the duration of the program will be extended as it is suggested above.

In conclusion, our future work will be the enrichment of the GSCC[8] (Χατζηπαπά 2005). which includes spontaneous speech only. The recordings of the children which were accomplished before and after the intervention program will be added to the extant corpus.

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[8]GSCC Greek Speaking Child Corpus

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