

THE ROLE OF AUDITORY DISCRIMINATION TESTS IN THE EVALUATION OF
BULGARIAN PRIMARY SCHOOL LEARNERS OF ENGLISH
PHONOLOGICAL AWARENESS

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ABSTRACT

The paper presents the results from a study of the level of L2 phonological awareness of 9-10-year-old Bulgarian children who study English in the primary. It focuses on the analysis and interpretation of the data from an auditory discrimination test used to pinpoint which target language phonemes pose difficulties for Bulgarian learners and highlights the key role of L2 phonological awareness in the teaching and learning of English.

Key words: phonological systems, second language learning, interference of L1

RESUMEN ABSTRACTO

El trabajo presenta los resultados de un estudio del nivel de conciencia fonológica L2 en niños búlgaros de 9-10 años de edad quienes estudian inglés en primaria. Enfoca en el análisis e interpretación de los datos de una prueba de discriminación auditiva usada para señalar qué fonemas del lenguaje producen dificultad para los aprendices búlgaros y resalta el papel clave de la conciencia fonológica L2 en la enseñanza y aprendizaje del inglés.

Palabras clave: sistemas fonológicos, aprendizaje de un segundo idioma, interferencia de L1

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Introduction

One of the main aspects of linguistic competence, which contributes to foreign language users' communicative competence, is *phonological awareness*. It provides learners with the abilities to auditorily differentiate the sound units of the foreign language, to identify and correctly produce them – abilities critical for the development of children's decoding skills, reading fluency, and spelling skills. The crucial role of phonological awareness in the development of primary school pupils' abilities to successfully use the target language in cases of communication across linguistic and cultural boundaries is recognized in the *Common European Framework of Reference for Languages* (2001), which provides a common basis for foreign language curricula development and which contains the phonetic and phonological knowledge and skills to be acquired by language learners.

The importance of phonological awareness instruction in the primary school foreign language classroom is widely reported. Research on children's L2 phonological abilities (Gottardo, 2002; Sparks & Ganschow, 1993; Stanovich, 1988) proves that primary school learners who possess "accurate phonological representations of L2 words, and the ability to manipulate those representations" (Handbook of Language and Literacy, 2005, p. 78) perform better in reading and writing in English than those learners who have difficulties in distinguishing, identifying and manipulating English language speech units. Moreover, studies that examine L2 phonological awareness attainment of English language learners (August & Shanahan, 2006; Lesaux & Geva, 2006) evidence that systematic phonological awareness

instruction results also in an “increased ability of decoding and spelling words and in a significant ability to comprehend text” (Statement of the National Reading Panel, 2001, p. 12). The literature (Cisero & Royer, 1995; Liow & Poon, 1998) also shows that L2 phonological acquisition is influenced by the L1 phonological system of children. The interference of the L1 phonological system could pose certain difficulties to primary school learners’ L2 linguistic development as it may take the form of a “perceptual ‘filter’ that removes the language specific phonetic details that define the L2 sounds” (Piske & Young-Scholten, 2008, p. 177) and thus prevent language learners from: (1) auditorily detecting cross-language phonetic differences; (2) establishing new representations of the target language phonemes (different from the mental representations of the L1 phonemes); and (3) converting the perceptual representations of the target language sounds into correct articulation. In the light of those findings, the present paper presents the results from a study that attempted to establish the level of development of L2 phonological awareness of 9-10-year old Bulgarian primary school learners’ of English and to pinpoint which English language phonemes are problematic for Bulgarian children.

Organization and Methodology of the Research

Participants

The research was carried out during the March – April 2008 / 2009 school year. Participants were 60 pupils of 9-10 years from two state schools in the town of Ruse (Bulgaria) – *Secondary School for the Study of European Languages* and *‘Bratya Miladinovi’ Primary School*. The pupils in both schools have elementary level of English and study English 3 times a week. The coursebook used in the English language lessons of 3rd grade pupils in both schools is

also the same – *Blue Skies for Bulgaria for the 3rd grade* (2007). For the purposes of the study the participants were divided in 6 groups at random.

Instruments

The instruments used for the assessment of Bulgarian learners of English L2 phonological awareness were the (1) *test of auditory discrimination of phonemes* and (2) *test of articulation*. Both tests were piloted during the 2007/2008 school year with grade 3 Bulgarian learners of English. After the piloting, the tests were edited and then used in the present study.

Due to the limitations of the current paper, we will present only the results from the *test of auditory discrimination*. It should be noted that as the initial version of the test (the pre-test) was designed to be used with 9-10-year old Bulgarian learners of English, it was meant to involve a simple procedure and to be conducted for a short time. This was the reason why we have made a more comprehensive and precise selection of the English language phonemes to be included in the pre-test. Therefore, we have taken into account the results from the contrastive analysis of the Bulgarian and English language phonological systems¹ and the distribution of English language phonemes. In addition to those data we have used the following minimal pair oppositions suggested by Hancock (2003):

- a) oppositions involving the English ‘pure’ vowels and diphthongs: [i : e], [ə : ɪ], [aɪ : ɪ], [a : (r) : eə (r)], [əʊ : ɒ], [ʌ : ʊ : u :], [ɜ:(r) : ɔ: (r)], [ɔɪ : aʊ];
- b) oppositions involving English consonants: [p : b], [g : k], [t : d], [s : z], [f : v], [h : w : j], [ʃ : ʒ : tʃ], [l : r], [m : n : ŋ], [θ : ð].

¹ The contrastive analysis of the Bulgarian and English language systems has been conducted by the author of the present paper as part of her Ph.D. topic

The pre-test included all English language phonemes distributed in 140 minimal pairs of words. The phonemes in the minimal pairs differed in the presence or absence of one differential feature (e.g. *emphatic :: non-emphatic, voiced :: voiceless, long :: short*) – *pin :: bin, sit :: seat, larch :: large, chip :: ship* etc. Some of the phonemes in the test were included in more than one minimal pair but in different distribution. This allowed us to explore: (a) whether the position of the phoneme in the structure of a word has any influence on the discrimination and identification of the sound unit; and (b) which position(s) of the respective phonemes were found most difficult by the Bulgarian primary school language learners.

After the piloting stage, which included measuring the validity, reliability, discriminative power of the test items, its means and standard deviation, the number of the minimal pairs that was reduced to 34 – 31, which differed in only one phoneme and 3 pairs of words in which the sounds within the pair were the same.

The minimal oppositions included in the final version of the test (which was used in the present study) were as follows:

[æ :: ʌ], [æ :: e], [ɪ :: i:], [i: :: i:], [əʊ :: əʊ],
 [əʊ :: u:], [ɔ: :: ʌ], [a: :: ɔ:], [ʊ :: u:], [u: :: ɔ:],
 [p :: b], [f :: v], [ð :: d], [ð :: v], [θ :: t],
 [d :: t], [s :: z], [s :: ks], [dʒ :: ʃ], [tʃ :: dʒ],
 [k :: g], [ŋ :: ŋk], [m :: n], [w :: v].

Procedure

The test of auditory discrimination was performed in the regular English classes of the primary school pupils. The instruction to the learners was in Bulgarian and was repeated before

the start of the testing procedure: ‘Listen carefully to the teacher. You will hear 17 pairs of words. If the words sound the same, write down a plus [+] in your handouts, if they are different, write down a minus [-]’.

Each minimal pair was repeated only once by the teacher with clear pronunciation, normal pace and falling intonation after each word. In order to minimize the negative influence of some external factors, e.g., noise outside the classroom, the distance of the pupils from the teacher and the lip reading the teacher was asked to stand about 2 meters from the first row of desks and to hold the sheet of paper with the test pairs in front of her face.

The test was divided into two parts and was administered during two English lessons; Part 1 containing the first 17 minimal pairs and Part 2 containing the rest of the minimal pairs. The administration of the each test part took about 10 minutes. The processing of pupils’ answers included the calculation of the correct and wrong answers of each pupil for each minimal pair.

Research Hypothesis

The study hypothesis is: 9-10-year-old Bulgarian learners of English face considerable difficulties in the auditory discrimination of those target language phonemes that have no equivalent in Bulgarian, namely:

- a) the English long vowels: [i:], [ɜ:], [u:], [a:], [ɔ:] ;
- b) The English short vowels: [æ] and [ʌ] ;
- c) the following English consonants: the dental fricatives: [ð], [θ] ; the velar nasal [ŋ] ; the glottal fricative [h] ; the palatal approximant [j] and the labiovelar approximant [w].

Interpretation and Data Analysis

1. Auditory discrimination of the English vowels

The presentation of the analyzed data focuses first on the mistakes in the auditory discrimination of English vowels and diphthongs.

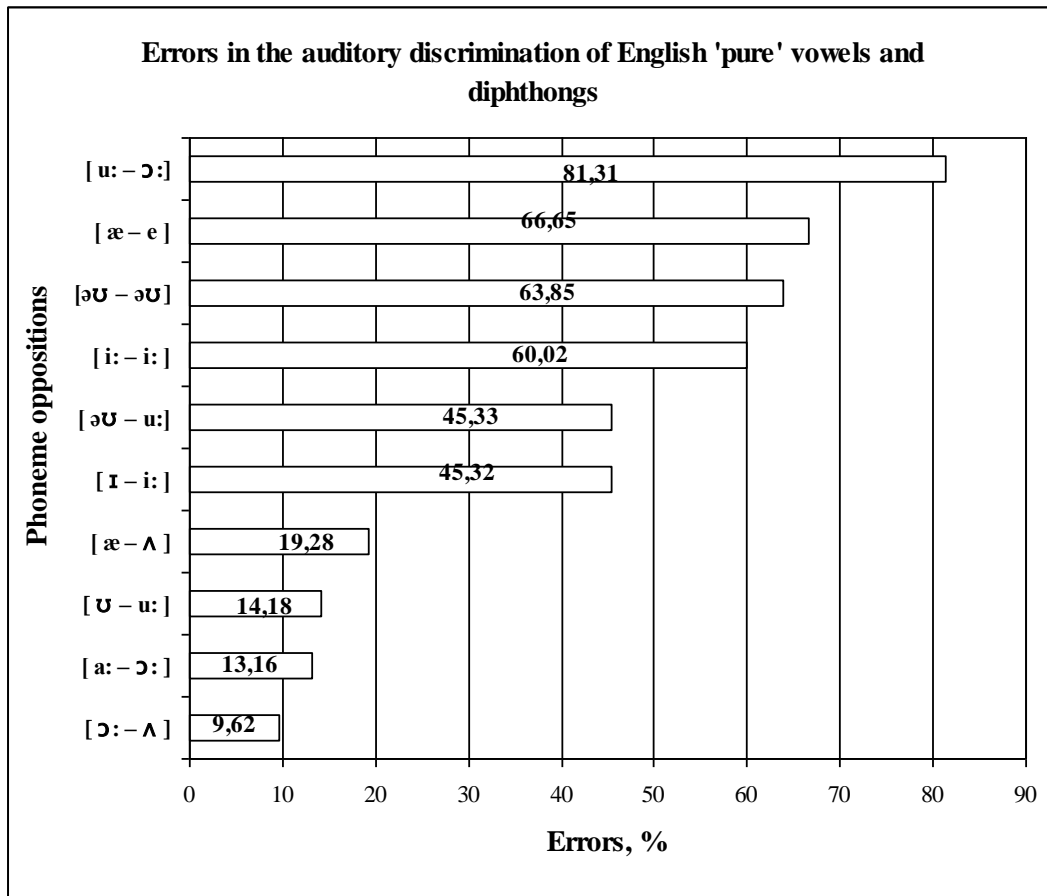


Fig. 1 Percentage of errors on the minimal pairs (vowel phonemes) in the auditory discrimination test

As is clear from the results presented in Fig. 1, the Bulgarian primary school learners of English find it most difficult to auditorily discriminate minimal pairs that contain two long English vowels. This result is not surprising as in our research hypothesis we have stated that Bulgarian children would have problems with the auditory discrimination of long English

vowels. What should be noted in this case is that contrary to our expectations, the primary school pupils encountered difficulties with the discrimination of those minimal pairs that contained two long vowels. For example:

- [u: :: ɔ:] with a percentage of wrong answers 81.13%;
- [i: :: i:] (present in two minimal pairs *please – please* and *ski – ski*), with a percentage of wrong answers 60.02%

The second most difficult minimal pair is [æ :: e] – 66.65%, which is in line with the research hypothesis. The fact that the Bulgarian phonological system does not contain a similar phoneme to the English short ‘pure’ vowel [æ] and the low level of L2 phonological awareness of Bulgarian children are the possible reasons for the high percentage of mistakes in this case.

The same interpretation could be used for the next two phoneme oppositions [əʊ :: əʊ] – 63.85% and [əʊ :: u:] – 45.33 %.

The sixth most difficult phoneme opposition is [ɹ :: i:] – 45.32 %. It appears in three minimal pairs in the test: *sit – seat*, *fill – feel* and *sin – seen*. Despite the fact that binary opposition *long vowel :: short vowel* is in middle position between two consonants, the percentage of mistakes in the auditory discrimination of the three minimal pairs is different. The most difficult of them is the minimal pair *fill – feel* – 50.37%. The possible reason for that is the low level of phonological awareness of the learners but L1 interference also plays a significant role here. As A. Cruttenden (1994) points during the initial stages of English language teaching of learners whose L1 belongs to the group of Slavic languages, teachers should devote time to the presentation and acquisition of the difference between the ‘pure’ and the ‘dark’ lateral consonant [l] because due to the interference of the features of articulation of their first language learners do not perceive the difference between those two phonemes and as a result

pronounce the ‘dark’ [ɫ] as a velar consonant in all its positions of distribution (Cruttenden, 1994).

Contrary to the research hypothesis the data from the auditory discrimination test reveal that the following vowel phoneme oppositions have not been found difficult by the Bulgarian primary school learners of English – [æ :: ʌ] – 19.28%, [ʊ :: u:] – 14.18%, [a :: ɔ:] – 13.16% and [ɔ: :: ʌ] – 9.62%. Those results could be interpreted in the following way – although the contemporary Bulgarian system does not have long vowels, as well as phonemes that are close in their articulation features to the English ‘pure’ vowels [æ] and [ʌ], the tested children do not have difficulties in the auditory discrimination of the phonemes in the respective sound oppositions. For example: in the opposition [ɔ: :: ʌ] the difference in the auditory perception of the two vowels is due to their articulation – the English vowel [ɔ:] is a long back half-open phoneme while the phoneme [ʌ] is a short half-open vowel. Despite the fact that the features of articulation of the English vowel [ɔ:] differ from those of the Bulgarian vowel [o] and the features of articulation of the English vowel [ʌ] differ considerably from those of the Bulgarian vowel [a], the Bulgarian 9-10-year-old children have correct mental representations of the Bulgarian vowels [o] and [a] and that is why they do not have problems with the auditory discrimination of the English vowels [ʌ] and [ɔ:].

2. Auditory discrimination of the English consonants

The analysis of the results from the auditory discrimination of the English language consonants shows that the research hypothesis has been partly proved (Fig. 2).

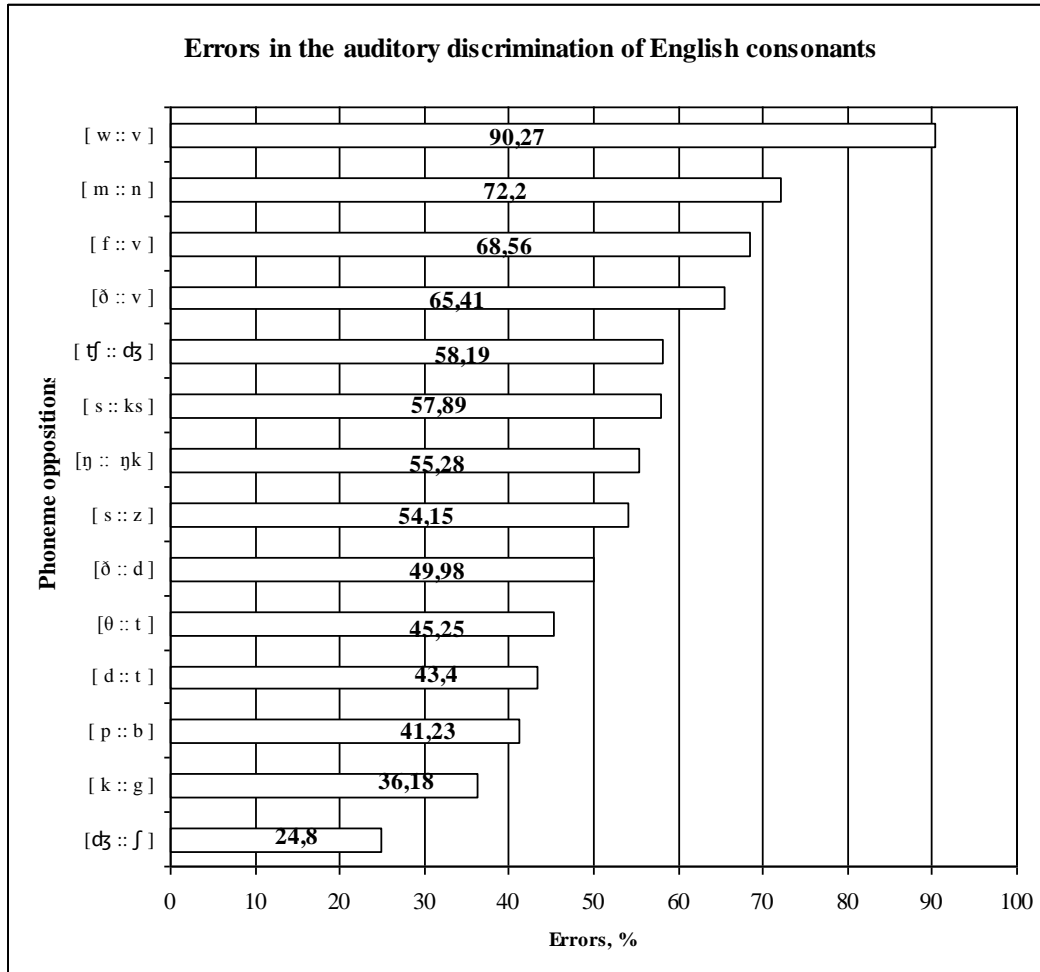


Fig. 2 Percentage of errors in the auditory discrimination of the English language consonants

The most difficult for the Bulgarian children target language opposition is [w :: v] – 90.27%. This result is in line with the formulated hypothesis of the study and complies with our supposition that Bulgarian children would find it difficult to discriminate the target language sound [w]. The interference of learners L1 has contributed to the high percentage of mistakes as we have deliberately chosen to include the word *vest* in the minimal pair *west – vest* because it is an homonym of the Bulgarian word *вест* / *vest* / (‘news’).

The second most difficult opposition is [m :: n] – 69.66%. It should be noted that this result contradicts with the research hypothesis. The presence of nasal phonemes in the Bulgarian

language system - [м, м', н, н'] / m, m', n, n' / and the relatively similar pronunciation features of the English nasals [m] and [n] were the reason why those English language phonemes were not considered a potential difficulty to Bulgarian children. However, the results from the auditory discrimination test clearly show that the minimal pair *warm* :: *warn*, which contains both English nasals, has caused considerable difficulties for the 9-10-year old Bulgarian pupils. A plausible explanation for that could be: alveolar articulation of the consonant [n] has not been fixed by primary school pupils as a specific characteristic of the phoneme.

The research data show that there is a considerable fluctuation in the auditory perception of the English phoneme correlations based on the opposition *voiced* – *voiceless* by Bulgarian primary school learners. The reason for that is the interference of pupils' L1 – in Bulgarian the consonant phonemes in final position are neutralized – e.g., *здрав* < *zdrav* > / *zdráf* / ('*healthy*'), *боб* < *bob* > / *bop* / ('*beans*'), *смок* < *smok* > / *smog* / ('*grass sneak*'), etc. That is why Bulgarian learners of English encounter problems with the auditory discrimination of the following word final phoneme oppositions:

- [f :: v] in the minimal pair *leaf* :: *leave* with 67.64% wrong auditory discriminations;
- [d :: t] in two minimal pairs: *hard* :: *heart* where the percentage of wrong discriminations is 40.81% and in *road* :: *wrote* with 58.75% wrong discriminations;
- [p :: b] in *cup* :: *cub* with 41.41% wrong auditory discriminations;
- [s :: z] in *ice* :: *eyes* with 56.17% wrong auditory discriminations.

Special attention should be given to the phoneme opposition [ð :: v] which has caused considerable difficulties to the Bulgarian primary school children – 67.62% of wrong

discriminations. Despite the fact that in our hypothesis we have stated that the English dental fricative [ð] would be problematic for the Bulgarian children, the phoneme oppositions [ð :: d] and [θ :: t] have a lower percentage of wrong discriminations than initially supposed. The percentage of wrong discriminations of the opposition [ð :: d] is 49.5 % and of the opposition [θ :: t] – 44.58%.

This result is difficult to interpret as research data from other studies (Celce-Murcia, Brinton & Goodin, 1996; Ellis, 1996; Pennington, 1996) on the mistakes in the pronunciation and auditory discrimination of English fricatives by learners of English as a foreign language show that a high percentage of the mistakes involves the substitution of: [ð] with [d], [θ] with [t], [f] with [p] and [v] with either [b] or [w]. Regardless of that, the results of the current research highlight the necessity for additional training of the Bulgarian 9-10-year-old Bulgarian learners so that their phonological awareness of the target language phonemes improves.

The percentage of mistakes in the opposition [tʃ :: dʒ] in the minimal pair *chain :: Jane* is 56.5%. This is quite unexpected as the Bulgarian language phonemes [ч] / tʃ / and [дж] / dʒ / are similar in articulation to the respective English consonants. Apart from that the English affricate [dʒ] appears in the minimal pair *jeep :: sheep* but the percentage of mistakes there is 24.06%.

The high percentage of mistakes in the auditory discrimination of [tʃ :: dʒ] in comparison with [dʒ :: ʃ] can be explained with some of the inconsistencies in the administration procedures of the auditory discrimination test (e.g., noise outside the classroom, low tone of voice of the teacher, etc.). However, it should be taken into account that when in initial position the English affricate [dʒ] is partly devoiced. According to Cruttenden (1994), the palatal

alveolar affricate [dʒ] is partly devoiced (just like the English plosives [b, d, g]) when in initial position.

Two of the oppositions which contain English language consonants include the nasal [ŋ] and the combination [ks], which do not have equivalents in Bulgarian - [ŋ :: ŋk] – 55.32% and [s :: ks] – 54.73%. Even though the combination [ks] appears in Bulgarian in loan words such as: *кекс* /kɛks/ “cake”, *латекс* /látɛks/ “latex”, *кодекс* /kódɛks/ “codex”, *снакс* /snaks/ “snacks”, *ксилофон* /ksilófon/ “xylophone”, *микстура* /mikstúra/ “mixture”, *текстура* /tekstúra/ “texture” it has been found difficult by the Bulgarian primary school learners.

Conclusion

The conclusions that we can draw on the basis of the results from the auditory discrimination test used with 9-10-year-old Bulgarian learners are:

1. The gathered data partly confirm the research hypothesis, namely:

1.1. The Bulgarian primary school learners of English encounter difficulties in the auditory discrimination of those English sounds that have no equivalents in Bulgarian:

- the long English vowels in the phoneme oppositions: [ɪ :: i:], [ə :: ɜ:], [ʊ :: u:], [ʌ :: a:], [ɒ :: ɔ:];
- the short English vowels [æ] and [ʌ];
- the diphthong [əʊ];
- the dental fricatives [θ] and [ð], the nasal [ŋ], the approximant [w];

- 1.2. Under the interference of their L1 (neutralization of word final consonants that are in voiced – voiceless opposition), the pupils have problems with the auditory discrimination of the English voiced and voiceless consonants in word final position.
2. The level of L2 phonological awareness of the Bulgarian primary school learners of English has to be further developed through carefully planned instruction which includes activities related to the auditory and oral manipulation of sounds – blending, segmenting words into their constituent sounds, phoneme deletion, substitution, etc.

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