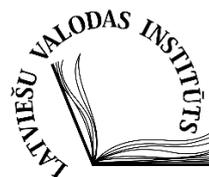




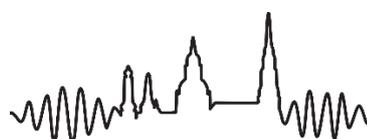
Latvian Language Institute
of the University of Latvia



3rd International Scientific Conference

**CONTEMPORARY RESEARCH
IN PHONETICS AND PHONOLOGY:
METHODS, ASPECTS AND PROBLEMS**

ABSTRACTS

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THE ANALYSIS OF INTONATION OF YOUNG CHILDREN: CORPUS-BASED STUDY

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The paper will focus on intonation studies of 17–28-month-old children. At this age the child more commonly uses utterances with incomplete structure (usually, one word sentences, for example, *mamma*, *mam* ‘mother’, *baba* ‘grandmother’, *dod* ‘give (me)’, *nē*, *ne* ‘no’), sometimes utterances with two or three components are used. Some children use sound clusters, not real words (*mm*, *ɲimɲi*) to draw attention to or indicate something. Our objective, using the data available, is to find out how early do children use falls and rises contours consistently to convey pragmatic function; do children express affective or pragmatic meanings first?

The data of three monolingual children (Latvian speaking) and one bilingual (Latvian and Russian speaking) child are analyzed. The data is taken from the first Annotated Longitudinal Latvian Children’s Speech Corpus. The data recording already lasts for 11 months. The monolingual children are recorded for 30 minutes per session, while the bilingual child is recorded for 30 minutes per session in each of his languages (Russian and Latvian). Four recording sessions per month will be conducted at regular intervals. The recordings gradually are orthographically annotated. The corpus is a part of the project “Latvian Language in Monolingual and Bilingual Acquisition: tools, theories and applications” that represents a systematic and comprehensive investigation of monolingual and bilingual acquisition of the Latvian language, unprecedented in theoretical and empirical scope.

The first observations and data analysis shows that a child whose first language is Latvian uses a phenomenon described as “jargon intonation” or “the tune before the words” (Peters 1977). That means that children use intonational patterns (one or more intonational contours) before they produced their first words, for example, *mm* could be pronounced with rising or falling pitch contour.

“Indeed, broadly defined category distinctions like closed versus open (for falling versus rising contours) could be described in terms of an emotions-based contrast between uncertain and certain” (Snow & Balog 2002, 1032).

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CHILDREN'S VOWEL DEVELOPMENTS IN HAKKA

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The article to be presented tries to answer the following two questions concerning children's vowel development. (a) What is the pattern of vowel changes, if any, reflected in different age groups with respect to spectral (vowel quality) and temporal (duration) dimensions? (b) When does sexual dimorphism start in terms of vowel development? Both theoretical and empirical implications are discussed in light of the myth or issue of linear or nonlinear difference of chronological age.

The target is the relativity between vowel formants (including F0, F1, F2, F3), duration and social factors (age, gender) on the basis of Praat program and SPSS statistics. It is the Hakka spoken in Taiwan that is in focus. The Hakka people are a minority in Taiwan as well as in China. They are quite specific in that Hakka has no land of their own. In total, 120 subjects (divided into 5 groups, age 5–6, 7–8, 9–10, 11–12, age 13–14, 15–16, each group 20 informants (male and female, each 10)) were recruited. They were asked to read a word list containing all the six Hakka vowels [i, e, a, o, u, ɨ] ([ɨ], an apical vowel) together with different tones.

In the literature, Varperian & Kent (2007) argue based on a detailed review that sexual dimorphism in vowel spectral properties (F1/F2/F3) begins at the age of 4, which can be more apparently realized at 7 or 8 when boys have lower formants than girls. However, Lee & Iverson (2009) report that there is no significance revealed among children vowels in American English and Korean in F0, while it was found that the significance between male and female informants of American English and Korean appeared at the age of 5. As it is, Hakka is a tone language in which tone is phonemically distinctive. Now the issue comes to our interest that there might be some difference in vowel formants between tone (Hakka and Mandarin) and non-tone languages (English and Korean).

Our findings are as follows. (a) The spaces of vowel distribution are essentially subject to chronological age, the younger the bigger while the older the smaller. (b) Non-high vowels (/e, a, o/) are systematically developed from low to high, meaning that F1 gets lower in Hz from the age of 5–6 to the age of 13–14. For instance, the F1 of [a] is from 980 Hz for 5–6-year-olds to 830Hz for those aged 13–14. However, high vowels (/i, ɨ, u/) are not so deviant in different ages. (c) A gap appears between adolescents and adults at age 13–14; before that, vowels converge together. Findings of (a) and (b) differ from what we have in the literature, but (c) further confirms the jump of vowel formants explored in Varperian & Kent (2007). In summary, the pattern of vowel changes is from larger to smaller space, in support of linear difference of chronological age.

ACOUSTIC CHARACTERISTICS OF ESTONIAN ADOLESCENT SPEECH: SOME PRELIMINARY RESULTS

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The acoustic-phonetic characteristics of adolescent speech differ widely from those of adult speech featuring age-related variations in fundamental frequency (F0), formant frequencies and duration due to the anatomical and physiological changes. Anatomically, children have shorter vocal tract and vocal folds. The anatomical growth of the vocal tract as well as size and mass of the vocal cords takes place through childhood and adolescence until adulthood. As the acoustic implication of the anatomical growth, age and gender related differences in fundamental frequency and in vowel formants have been documented in different languages. The vowel space area (VSA) has been found to be significantly large in children's speech than in adults and it reduces gradually until adulthood.

In Estonian, similarly to many other languages, most of phonetic research carried out throughout decades has exploited speech samples of adult population and rather little data is reported on the acoustic characteristics of child and adolescent speech. The development of the Corpus of Estonian Adolescent Speech was started in 2011 under the national program "Estonian Language Technology (2011–2017)". The corpus includes speech recordings of native Estonian subjects in the age range from 9 to 18 years and it focuses on two main aims: (1) to provide speech data for socio-phonetic studies addressing the development of voice and speech of Estonian adolescents, and (2) to serve as a resource for training and testing speech recognition systems for this age group.

The corpus contains linguistically diverse material: digits, numbers, phone numbers, time and date expressions, IT terms, sentences with place, person and institution names, phonetically rich sentences, and two longer passages. Samples of spontaneous speech are elicited with standard prompts including self-introduction and topic suggestions for storytelling (about school, hobbies, etc.), and pictures to be described. The recordings were carried out in ten schools — four in the capital area, two in North-East Estonia, two in South-East Estonia, and two in Saaremaa.

We will report some preliminary data on the speaking fundamental frequency, the vowel space area (VSA), and temporal characteristics of Estonian adolescents.

Different F0 characteristics (mean, median, minimum, maximum, and standard deviation) and distributions were calculated. For male speakers, F0 mean decreases gradually from 230 Hz to 190 Hz at the age from 9 to 13 years, due to puberty voice mutation it drops down ca 60 Hz at the age 13–14, and then it lowers further from 130 Hz to 110 Hz at the age from 14 to 18 years. For female speakers, F0 mean shows a gradual change from 240 Hz (9 years) to 210 Hz (18 years).

To explore VSA development, the frequencies of the first and second formants of Estonian stressed vowels were measured. In both genders, the reduction of vowel space correlated with age is observed. In females it takes place mainly in the F2 dimension, whereas in males in both the F2 and F1 dimensions.

Temporal characteristics of adolescent speech exhibit some age-related differences, whereas gender-related differences are minor.

EFFECTS OF DUAL-SENSORY IMPAIRMENT ON READING ALOUD

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Reading aloud is frequently used in articulation studies, as it gives a precise context to the speech sounds studied and as such can be used to control the coarticulatory patterns in speech to concentrate on the specific speech sound in question. Carrier sentences give possibilities to control stress and intonation positions in sentences, and the informant is still able to retain their individual speaking rate and intonation patterns.

Dimensions of text on the paper might affect the speech rhythm. The longer the sentence, the more difficult it is to keep a coherent speaking rhythm, especially if the layout on the paper is stretched over many lines. This difficulty is increased if there are limitations of vision, such as decreased visual acuity or a narrow visual field.

Dual-sensory impairment and its effect varies in different tasks — here visual impairment has more effect on the task itself, but for the overall situation, the hearing impairment has its effect as well. A holistic look is needed both on the rehabilitation process, as well as on the specific studies on the sum of effects from both types of impairment on the behavioural patterns in various types of tasks.

THE PHONETIC CHANGES OF THE CONTEMPORARY LITHUANIAN DIALECTS: PUNSKAS AND SEINAI SUBDIALECT EXAMPLE

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At the beginning of the 21st century, many changes connected with greatly changed politics, economy, emigration and immigration and other phenomena are taking place in Europe. Nowadays the Punksas and Seinai subdialect, attributed to the Southern Aukštaitian by the main distinguishing features, is the largest island of the old ethnographic Lithuanian language area that is developing in its own way due to the influence of the Polish language, the sociocultural context determined by history as well as by other factors. Although this subdialect has preserved many archaic language peculiarities, it is acquiring increasingly more phonetic, lexical, syntactic and other innovations.

In the paper, basing on the material collected implementing two projects — *Modern Geolinguistic Research in Lithuania: The Optimisation of Network Points and the Interactive Dissemination of Information* and *Lietuvių tarmių kaita XXI a. pradžioje: Punksko apylinkių šnektos* — over 2013–2015, the changes recorded in the phonologic system and their causes in the present Punksas and Seinai subdialect are discussed. It differs from the neighbouring Southern Aukštaitian subdialects mainly by the usage of the consonants. The language users' age and ratio of other variables to a gradual change of the articulation basis, the change in the intonational contour of the sentence, the importance of the sociocultural networks and other factors have been taken into account.

WORD-FINAL LABIALIZED CONSONANTS AS A CUE FOR DETECTING PROSODIC BREAKS IN STANDARD RUSSIAN

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This paper deals with the problem of prosodic phrasing in a spoken text. The introductory section provides a brief description of the background, clarifies basic terms and explains the concept of prosodic break and word boundary strength. The second section contains an analysis of the current state of research in this area of phrasal prosody, highlights the main directions of the modern fundamental studies and applications, notes their relevance and the need to expand their empirical base. The third section deals with issues related to the local markers of prosodic phrasing, their hierarchy and phonetic means of realization.

The main part of the paper is devoted to some results of the experimental research, aimed at finding out whether some phonetic realizations available in word-final consonantal /stv/ clusters in an external sandhi position in Modern Standard Russian may serve as a cue for detecting the location and depth of prosodic breaks.

The obtained results show that at the word junctures /stv/ cluster (e.g. *чувств* = *чувств* ‘feeling, GEN.PL’, *обстоятел’ств* = *обстоятельств* ‘circumstances, GEN.PL’) in Modern Standard Russian may result in [stəf] or [stw] pronunciation. The percentage ratio of the above mentioned pronunciation types depends on the strength of the prosodic break after the word in question: the realization with the labialized final consonant may be regarded as a clue for detecting prosodic break after it.

PHONOTACTICS DETERMINATION IN TSWANA LOANWORD PHONOLOGY

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It is known that languages in contact invariably adopt words from one another and regularly adapt these words to fit the phonotactic as well as the phonetic structure of the particular language. The occurrence of adoptives (loanwords) in Tswana (a Bantu language of the Sotho language group in South Africa) is a case in point, particularly as new terms (technical and otherwise) are generated in English and Afrikaans, out of necessity find their way into local languages. In the process of determining the favored syllable combinations in Tswana, a basic method similar to Janson's method (1986) was applied to extract automatically, using Perl scripting, the frequencies of C (Consonants), V (Vowels), N (Nasals) and their combinations from a specific corpus. This corpus was generated from a web crawler used to download text-corpora for each of these two languages, which are among the eleven official languages of South Africa. The main web domain was the South African government domain (gov.za) and services.gov.za as it contains a variety of documents that has been translated for the community in all eleven official languages of the country.

Preliminary findings indicate that the syllabic requirement in Tswana is no longer just the phonotactics (the canonical syllable structure) that determines the core syllable types of the receiving language in the transphonologisation process. At the phonotactic level, and with a thorough experimental methodology, it is possible to determine the preferred syllable structures of a language and explain the various "unusual" combinations that result from transphonologisation. However, this aspect of the analysis can be regarded as merely a portion of the explanation when one considers levels beyond phonology. Thus, the investigation should consider other aspects such as the comparison of determined preferred syllable structure with syllable structures of adoptives by statistical means, the phonetic interpretation, and the sociolinguistic factors involved in the linguistic borrowing. The discussion on this paper will focus on the first two domains.

This study adheres to the theory which states that preferred syllables are the result of their overall distribution within the sound structure of the particular language, which in turn can be explained in terms of perceptual, articulatory or sociolinguistic characteristics.

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**WHAT CAN BE REDUCED AT THE BEGINNING
OF AN INTERPAUSAL INTERVAL:
EVIDENCE FROM RUSSIAN SPONTANEOUS SPEECH***

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According to the Probabilistic Reduction Hypothesis, “word forms are reduced when they have a higher probability” (Jurafsky et al. 2001, 229). A word form can be probable by itself, i.e. if it is frequently used, or its high probability can arise from the context. While recognizing spontaneous speech listeners presumably make use of both of the factors. A reduced realization of a word form of high frequency can be stored in the mental lexicon of a listener as a separate entry, if it is used more often than the canonical variant, whereas the majority of reduced realizations are reconstructed to the canonical variant from the context (see Ernestus 2002; Rajeva 2012). As context is believed to be a crucial factor in the processing of reduced word forms, we can assume that word forms are less likely to be reduced at the beginning of a phrase than in any other position.

In order to check this hypothesis we analyzed the realizations of all initial word forms in the interpausal intervals from the Corpus of Spontaneous Russian (115 minutes of radio interviews and talk show recordings; for further details, see Riekhakaynen (2015)). We considered a word form to be reduced if it had at least one omitted sound. Around 50% of all interpausal intervals analyzed had a reduced initial realization. These realizations can be divided into three groups: 1) realizations with a low degree of reduction, i.e. with one or two omitted sounds or with a reduced ending (e.g., *которая* ‘which.NOM.SG.F.’ [ke'tore]); 2) combinations of two words with a sound contraction at a word boundary (e.g., *всего_общества* ‘the whole.GEN.SG.N society.GEN.SG’ [fsjəvopɕs]); 3) typical reduced realizations of frequent word forms (e.g., *сейчас* ‘now’ [ɕæs]). The results generally support our hypothesis as highly reduced realizations (besides those of high frequency that can be probably stored in the mental lexicon as separate entries) were shown not to occur at the beginning of interpausal intervals and the reduced realizations that do occur in this position are supposed to be easily reconstructed to their canonical variants as they normally do not have more than two omitted sounds.

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INTONATION, THE LINGUISTIC SIGN AND CONTENT TYPOLOGY

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In his highly informative and innovative for its time *Analīz rečbevoj intonacii*, the Latvian phonetician L. Ceplītis argues for the systematic approach to the study of intonation, and answers affirmatively by providing a comprehensive analysis of the linguistic aspects of the intonemes of Latvian intonation having compiled first 'a hypothetical list of meanings based upon preliminary observations of the linguistic data' (Ceplītis 1974, 164). The present paper, in its turn, poses first the theoretical issue of intonation as a system of signs and views it, in contradistinction to Saussure's word-based approach, along the lines of a more powerful model, the latter being based upon the lines of a predicative structure of a 'defined – copula – definer' type. In this way, the model avoids the traps of a fixation on the word as the basic unit of linguistic analysis since, both typologically and phylogenetically, the latter has been proved to be a secondary formation compared to predicative phrase structures. Following the tenets of content typology as developed by the Russian school (Katsnel'son, Klimov, Guchman, inter alia), the 'defined – copula – definer' sign structure is posited to be a function of the state of the subjective – objective relationships, the latter being conceived of as the distance between the process and the first participator. On this approach, intonation, if need be, becomes an exponent of the relational category of case per se and its realizations are the only means for disambiguating the respective syntactic structures. Such instances exemplify older stages in the stadial development of languages as defined in content typology. It is yet one more proof to the figure/ground approach to meaning by postulating a relationship between them in potential in language, and as realization in speech. Such an effect can be metaphorically referred to as the 'effect of the palimpsest', illustrating a correlate of the ever growing and deepening process of human cognition. The model can be employed not only in respect to nominative languages, but can also be applied to languages of the class, active and ergative type. It also allows for a high degree of the flexibility of the boundaries of the most elementary intonational unit — the Intonational Phrase (IP), thus providing some additional theoretical illumination on the linear nature of intonation as a linguistic sign.

PRODUCTION OF ESTONIAN CONSONANTAL QUANTITY CONTRASTS BY LATVIAN SUBJECTS

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The paper continues our study on the production of Estonian three-way quantity contrasts (Q1, Q2, Q3) by L2 subjects with Latvian language background focusing this time on the production of the consonantal quantity contrasts. In Estonian, the consonantal quantity oppositions occur in the intervocalic position at the syllable boundary as a singleton vs. geminate contrast. The mean duration of a singleton consonant in Q1 structure is 68 ms, and the mean duration of a geminate consonant is 120 ms and 170 ms in the structures Q2 and Q3, respectively. The mean geminate/singleton duration ratio is 1.8 for Q2 vs. Q1, and 2.5 for Q3 vs. Q1 comparison. The characteristic syllable duration ratio in native Estonian speech is 0.9 for Q1, 1.9 for Q2, and 3.6 for Q3.

Our previous study on vocalic quantity contrasts showed that Latvian subjects successfully produced the Estonian Q1 vs. Q2 contrast, but they failed to produce the Q2 vs. Q3 contrast. Hence, it can be hypothesized that similar results are expected in the production of consonantal quantity contrasts. However, different patterns can emerge for different consonant groups due to differences in the orthography. In plosives the three quantity contrasts are manifested orthographically, that contributes to the better discrimination of the contrasts in L2 production. In the case of other intervocalic consonants in Q1 and Q2 are revealed in the orthography, but not in Q2 vs. Q3 contrast.

Latvian subject group consisted of 20 subjects from the University of Latvia. For 16 subjects Latvian is their L1, four students are Latvian-Russian bilinguals. The students have studied Estonian for 1–2 years starting at the age 18–20. The control group consisted of 12 native speakers of Estonian. All subjects participated in the recordings of the Estonian Foreign Accent Corpus. For the study a subset of the corpus containing 33 disyllabic target words (11 triplets) representing the consonantal quantity contrast Q1 (CV.CV), Q2 (CVC.CV), and Q3 (CVC:.CV). The target words were embedded in short meaningful sentences of similar structure.

The durations of all constituent segments (C1, V1, C2, V2) in each target word were measured using a Praat script, and the syllable duration ratio distinguishing the three quantity oppositions was calculated.

Latvian subjects produced the mean duration of a singleton consonant in Q1 structure is 71 ms, and the mean duration of a geminate consonant is 122 ms and 144 ms in the structures Q2 and Q3, respectively. The mean geminate/singleton duration ratio is 1.7 for Q2 vs. Q1, and 2.0 for Q3 vs. Q1 comparison. The syllable duration ratios are 1.5, 2.8, and 3.3 for Q1, Q2, and Q3, respectively.

The results showed that the L2 subjects produced most segment durations, geminate/singleton duration ratios and syllable duration ratios different from the native group, however they distinguished well all three quantity degrees in the case of plosives, and less reliable in the case of non-plosive intervocalic consonants.

TWO TYPES OF BILINGUALS — TWO TYPES OF PRODUCTION CONTEXTS

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Bilinguals may be considered to be balanced if they have acquired both their languages simultaneously from birth, whereas the term dominant bilingual is used when their second language is learned at school after acquiring their mother tongue. Our previous studies have shown that the balanced bilinguals' mother tongues, or more precisely, their phonological systems, are intertwined so that one language cannot be "switched off" when only the other is used. This was shown in both behavioural and attention-independent perception. However, the dominant bilinguals seem to have separate phonological systems which do not interfere each other in the behavioural or the pre-attentive perception and these systems are triggered on in response to the linguistic context.

The aim of this study was to see whether these two types of bilinguals differ also in speech production. As in our earlier study, we tested balanced and dominant Finnish-Swedish bilinguals; the balanced bilinguals had acquired both languages from birth in a one-parent one-language manner and the dominant bilinguals were advanced Finnish university students of Swedish who had learned the second language at school. In order to see how different language contexts affect different bilinguals' speech production, the subjects were tested three times: once in a Finnish, once in a Swedish and once in a mixed language context. Half the subjects were tested first in Finnish, half of them first in Swedish, and for all of them the last context was the mixed one. There was a Finnish speaking researcher in the Finnish context and subjects were presented with Finnish words. In contrast, there was a Swedish speaking researcher in the Swedish context and subjects were presented with Swedish words. Both the Finnish speaking and the Swedish speaking researchers were present and both languages were used in the mixed condition where subjects were presented with both Finnish and Swedish words. The target words contained closed rounded vowels and the subjects were instructed to read the words out loud. The closed round vowel area constitutes an interesting difference between the two languages since in Finnish it is divided into two categories (/y/ and /u/) while Swedish distinguishes between three categories (/y/, /ɥ/ and /u/). All the test conditions contained also non-target words for distraction. The recorded words were then measured acoustically (F1 and F2) and statistical analyses were performed to see whether groups differed and whether the language context had an effect on production.

Preliminary results show that the groups differed in the way they produced different vowels in different language contexts. Both groups produced both /y/ and /ɥ/ differently in different language contexts, whereas, /u/ was produced similarly in the two contexts. The dominant bilinguals made the variation in both /y/ and /ɥ/ through F1 while the balanced bilinguals made it through F2. This indicates disparity between balanced and dominant bilinguals in their speech production as well. The final results and conclusions will be presented at the conference.

**LATERAL CONSONANTS IN BULGARIAN AND GERMAN:
EFFECTS OF THE HISTORICAL DEVELOPMENT OF BULGARIAN
AND THE PHONOTACTICAL INTERFERENCES
BETWEEN BOTH LANGUAGES ON THE ACQUISITION
OF THE GERMAN PALATIZED LATERAL [ɹ] FROM BULGARIANS**

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This paper investigates the growing tendency for pronouncing the “hard” Bulgarian [ɹ] (alveodental laminal lateral consonant) as labio-velar approximant [w], velar approximant [ɰ] or velarized [ɹ̥] before back vowels amongst the younger generation in Bulgaria (Zhobov 2004; Burov 2012) and its effects on acquiring German, where /ɹ/ is palatalized no matter of its distribution (Kohler 1995). It was observed that perceiving of the unusual for the Bulgarian phonotactic rules German sound combination [ɹ] + [back vowel] is often taken as [ɹ] + [j] + [back vowel]. The obtained results were interpreted in the light of the historical development of the Bulgarian language, where there used to be pairs of palatalized (“soft”) and unpalatalized (“hard”) consonant phonemes, the tendency for dropping palatal consonants and the decomposing of the feature [palatalness] from the palatal consonant phonemes, whereby the feature has moved to the following vowel and thus created an independent phoneme — /j/ (Choi 1994).

NON-NATIVE SPEECH SOUND PRODUCTION CHANGES EVEN WITH PASSIVE LISTENING TRAINING

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Speech sound production is language-specific in the way that speakers acquire the productional patterns relevant for the mother tongue during infancy and these motoric configurations persist at least with constant updating provided by the feedback system. This certainly is an economical system, since it enables the productions to be less capacity consuming, but on the other hand, it presents problems when new languages are to be learned. Non-native speech production patterns need to be acquired and the native ones appear to inhibit the formation on new templates. For this reason, it is assumed that learners need to practice articulatory gestures. In addition, earlier research has shown that learners may differ in their ability to learn new patterns and these differences may be related to e.g. age.

In order to see whether mere acoustic passive exposure would result in motoric learning, we designed a protocol for two groups of native speakers of Finnish. The stimuli in both training protocols included a non-native speech sound contrast /y/ – /**u**/ embedded in a pseudo-word context /ty:ti/ – /**t**u:ti/. Group 1 performed a listen-and-repeat training, where they heard the words consecutively and were instructed to produce according to the model. The second group heard the same stimuli in exactly the same manner, but they did not produce the stimuli during the training sessions. Our earlier studies have indicated that a listen-and-repeat training results in rapid production changes in both child and senior learners, this time the subjects were young adult Finns.

Our results show that there were no statistically significant differences between the two training groups and that the formant values did not change in either group as a result of training. Instead, there was a difference in the vowel quality of the produced native and non-native stimuli already in the first baseline measurement. These findings suggest that the subjects in both groups were able to produce the native and the target sound differently without any training, which shows that in comparison with child and senior learners, young adult learners show more plasticity. Interestingly, the statistical analysis of the standard deviation values for the second formant showed that the deviations decreased by the third session in the non-native productions indicating that the both groups produced the target sound more systematically after training.

Altogether, these results indicate that young adult learners are able to adjust their articulation very rapidly and that training results in less articulatory hesitation. Most interestingly, it seems that mere passive auditory exposure results in productional adjustments

AMERICANISATION VERSUS COCKNEY: ACCENT STYLISATION IN POP SINGING

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The paper focuses on the problem of style-shifting in British pop singing. As observed by Trudgill (1983), the use of six stereotypically American pronunciation features had been popular among British vocalists since the 1950s. Americanisation phenomenon became less noticeable with the arrival of new wave and punk rock in the 1970s. The two main tendencies in the singing accent, i.e. Americanisation on the one hand, and the use of some working class features on the other, mingled and coexisted to create a conflict of identities. Since that time, changing trends in popular music singing styles have been observed (Simpson 1999; Gibson 2005; Beal 2009).

With Trudgill's observations and predictions as departure points, this article's aim is to analyse selected features of contemporary pop singing on the basis of Amy Winehouse's accent. The focus is on potential Americanisation, as jazz and soul singing styles seem to be prone to the phenomenon due to the American roots of these musical genres, and the influence of the working class accent, as the singer was born in London. Amy Winehouse's spoken accent is used for comparison (on the basis of selected interviews).

The quantitative analysis is based on two studio albums released by the vocalist: *Frank* (2003) and *Back to Black* (2006). Three phonetic features have been chosen for the analysis, all of which can be indexed as "American": yod dropping, coda-r and the lack of TRAP-BATH split. Additionally, the overview of selected Cockney features is presented. Praat is used for the acoustic analysis of selected instances of the BATH and TRAP vowels (on the basis of isolated vocal tracks and the interviews); while consonants are coded auditorily.

The results show relatively strong influence of American English: 100% of Americanisation with regard to the lack of TRAP-BATH split on both albums; rise in rhoticity from 30% on the first to 43% on the second album, as well as the respective rise in yod-dropping from 73% to 100%. The results on both albums seem to correlate with changing musical styles and the growing popularity of the singer.

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LATVIAN MONOPHTHONGS PRODUCED BY INFORMANTS OF DIFFERENT AGE GROUPS (5–15, 16–39, 40–59, and 60–80)*

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The current study deals with the spectral characteristics of the Latvian monophthongs produced in zero context. Although being hyperarticulated, such monophthongs display the acoustic qualities closest to those of the mentally stored acoustic targets. The aim of the research was to study the spectral characteristics of monophthongs produced by informants of different age — ranging from 5 to 80 years. It was expected that the growth of the speech organs would be reflected by reduction of the formant values. At reaching puberty the only factors causing differences in formant structures of monophthongs should be caused by gender or individual speaking habits. It was predicted that monophthongs produced by adults would form well separated and rather compact quality zones on the acoustic F2/F1 plane. The deviations from these zones could be expected not only in the data of children, but also in those of elderly people where they would be caused by aging processes of the speech organs.

The results of the spectral analysis suggest that the process of aging (after 60) has not left a significant influence on the formant structure of monophthongs, because their location on the acoustic F2/F1 plane is close to the adult reference (acquired as the mean value for the group of 19–60-year-old informants) even for the oldest informants (male 80, female 79 y.o.a.). The differences are thought to be based on the individual speaking habits.

At the same time, the changes in the formant structure are clearly seen during the growth period between 5 and 15 years. During the growth, the acoustic vowel space gradually reduces and shifts to lower frequencies more or less retaining the relative placement of monophthongs. Although the differences between the monophthong data of male and female speakers in the pre-puberty period were not predicted, they were observed even in the data of the youngest informants (male 5, female 6 y.o.a.). This difference seems to be grounded in the different articulatory strategies employed by boys and girls instead of the differences in the sizes of their resonating cavities.

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ARTICULATORY MOTOR COORDINATION IN FINNISH VOWELS

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Vowel articulation has mostly been studied by using measurements of speech sound acoustics, which is in fact an indirect measure of articulation. The most important factors in vowel description are frequencies of the first and second formants (F1 and F2), which actually separate all vowels from each other by these values. In addition to acoustic measurements, articulatory motor coordination has been studied via X-ray photographs in earlier studies. These photographs give only a static image of the position of the vocal organs. Actually, there has been quite little attempt to show how the movements of the vocal organs generate the variations in air pressure and consequently in frequencies which are specific to each speech sound (Ladefoged 1962).

In this study, eleven monolingual Finnish women participated in a production task. Their speech data was collected by ultrasound system to measure articulatory motor coordination movements during speech production. The lip camera was used to monitor movements of the lips. The ultrasound data will be analyzed using Articulate Assistant Advanced software. In addition to ultrasound registrations, the productions were recorded in order to measure acoustic characteristics of the same articulations. In production task, the participants repeated pseudowords, which were presented on the screen. The words were in accordance with Finnish phonotactic rules and each word contained one target vowel resulting in eight targets according to the Finnish vowel system. The speech sound context was exactly same in each word, only the target vowel changed. The purpose of the study is to relate the articulatory motor coordination movements of the tongue and the lips to the acoustics of the speech sound.

The presentation will showcase the findings of the articulatory motor coordination in relation to acoustics in Finnish vowels. Because the study is still in progress, there are no results to report here in this abstract, but they will be presented in the conference. In this study, weight was put on testing the ultrasound system as a research method of speech articulation, and therefore also the method will be presented during the talk.

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DIPHTHONG IN PERCEPTION — ONE VOWEL OR A COMBINATION OF TWO?

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The current study deals with the auditory features of the Latvian diphthongs [ie, iu, ei, eu, ai, au, ɔi, ɔu, ui, uo]. In the framework of this study, two perception experiments were conducted in order to explore the auditory significance of the initial part of the first component and the final part of the second component, as well as the formant transitions of the Latvian diphthongs because these segments contain the relevant information of diphthong articulation.

The study is based on data of 33 adult respondents and 44 children, who have indicated Latvian as their mother tongue. The perception experiments were performed using stimuli of naturally produced units. Thereafter they were edited with software Praat for the purposes of each experiment by cutting or erasing some parts of diphthongs.

It can be expected that significance of formant transitions would be relevant in perception of diphthongs because formant transitions take more than a half of each diphthong duration and according to the acoustic data formant transitions are the fundamental feature of diphthongs.

The results of the experiments show that formant transitions play an important role in the recognition of diphthongs and the results are better in both groups of respondents. There were problems only in the recognition of [ɔi].

However, children responses do not correspond to adults' data, especially in the experiment with the steady state of the first and second component. It can be concluded that children have problems to recognize often used diphthongs, e.g., the less common diphthongs [eu], [iu], are better recognized than the more common [ei] and [ie]. An unexpected result is mixing up with [ei] and [eu] because formant transitions of the second component differ for both diphthongs. The individual differences can be seen in children's responses more than in adults' results, also the children marked unreal diphthongs, e.g., [iɑ] is marked instead of [ie], [aɔ] is marked instead of [uo].

Adults' and children's perception is different, and it can be seen in the second experiment because there were very short stimuli (approximately 60 ms). It is also possible that children focus more on the quality of the initial component.

PRODUCTION TRAINING OF VOWEL DURATION DIFFERENCES

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The purpose of this study was to determine whether a short listen-and-repeat training paradigm can be used to train vowel duration discrimination and production, and whether any learning effects would be transferred into an untrained vowel or a non-linguistic sound. This approach is supported by the DIVA model of speech acquisition, which suggests that speech motor patterns are learned by observing one's own productions through neural feedback mechanisms and modifying them until they match acoustic categories. Similar training has previously been successfully used to train vowel quality contrasts to young adults and children, with results showing up both in behavioral and psychophysiological measurements. Unlike vowel quality, segment duration can be considered to be a suprasegmental feature. It is therefore of interest to test whether it can be trained similarly to segmental features. As duration discrimination is not directly dependent on any other acoustic feature of the sounds being trained, it is possible that it can be learned a separate skill, in which case learning effects in trained segments could also be seen in untrained segments, and even non-linguistic sounds.

Participants were 18–30-year-old healthy adults with normal hearing, who did not speak Finnish as their native language and had spent little time in Finland. Their other linguistic skills were carefully screened to exclude languages with phonological length contrasts. The vowel stimuli used in the experiment were semisynthetic Finnish pseudoword pairs /tite/–/ti:te/ and /tote/–/to:te/, differing in the duration of the first vowel. A sinusoidal tone pair, equal in duration to the word stimuli, served as the non-linguistic stimulus. The /tite/–/ti:te/ pair was used in the production training, while the other two pairs were used to measure transfer of learning effects. The behavioral measurements employed in the study were an oddball discrimination task for all three stimulus pairs, and a listen-and-repeat production task for both of the vowel pairs. Listen-and-repeat was also used as the training task. No feedback was given during training.

The experiment was conducted in three sessions over three days. The first two days were consecutive and the third was 1–2 weeks after the second. The first two days consisted of baseline measurements for all the stimuli and four blocks of production training. The third day consisted of full progress measurements.

Preliminary results show clear changes in most of the measurements taken. In the discrimination task, reaction times decreased and discrimination sensitivity increased for all stimulus pairs. In the production task, subjects reliably produced the /tite/–/ti:te/ contrast with consistently different durations by the end of the experiment. It seems, therefore, that more accurate duration discrimination is not limited to trained stimuli, or even to solely linguistic segments. Even at this preliminary stage, these results clearly show promise for this type of training for suprasegmental features.

PHONETICS AND PHONOLOGY OF THE CIVILI MID-VOWELS

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The vowel system of Civili, a developing language in west central Africa, has been the subject of various studies. Quality of mid-vowels has been posited as a phonological issue whose only fairly coherent solution suggested so far is the hypothesis of vowel harmony. However, arguments and findings of the vowel harmony assumption have never been tested with verified phonetic data at neither acoustic nor perceptual level. This paper focuses on the acoustic aspects of the problematic vowels. An acoustic approach appears to be a better procedure towards the solution of a number of issues in the phonology of Civili. This implies to consider the question of data. It is in fact known that the lack of proper data and accurate methods may lead to opaque results and imperfect findings. Based on verified acoustic data, the present study gives a phonological interpretation contrary to claims of previous studies. Findings suggest a vowel-to-vowel coarticulation by assimilation. The contribution of this paper also pleads to deal with current procedures of laboratory phonology and phonetic sciences in the study of lesser known languages such as Civili.

**LOCUS EQUATIONS FOR THE LATVIAN CONSONANTS
PRODUCED BY INFORMANTS OF DIFFERENT AGE GROUPS
(5–15, 16–39, 40–59, and 60–80)***

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In the current research, the consonants of Standard Latvian have been investigated using locus equations. The aim of this study is to compare the results provided by informants of the four different age groups (5–15, 16–39, 40–59, 60–80) in order to detect an age impact to the acoustic signal of the consonants. According to the locus equations' data, the consonants of Standard Latvian are characterized in the terms of place category and coarticulation.

There are 26 consonants in the Standard Latvian: 1) labials /p, b, f, v, m/; 2) dentals /t, d, s, z, ts, dz, n/; 3) alveolars /ʃ, ʒ, tʃ, dʒ, l, r/; 4) palatals /c, j, ģ, ɲ/; 5) velars /k, g, x/. Each syllable initial consonant (C) has been studied in the phonetic context of all 12 monophthongs (V) of the Standard Latvian /i(:), e(:), æ(:), a(:), o(:), u(:)/. The recording material consists of isolated, symmetrical CVC syllables pronounced by 20 native male speakers (children and adults) of the Standard Latvian, e. g. [gi(:)g], [ge(:)g], [gæ(:)g], [ga(:)g], [go(:)g], [gu(:)g]. In the framework of this study the material of totally 9360 CVC syllables have been analyzed.

It has been hypothesized that the greatest age-related impact will be displayed by the first (5–15) and the fourth (60–80) groups of the informants in comparison to the rest groups (16–39 and 40–59) of the speakers. In the first and the fourth groups a greater data distribution is also expected as a result of a growing or an aging, while the second and the third groups are expected to be more homogeneous.

* This study is supported by the Latvian Council of Science and conducted in the framework of the scientific research project “The acoustic characteristics of the sound system of Standard Latvian by age groups (5–15, 16–39, 40–59, 60–80)” (No. 148/2012; project leader *Dr. philol.* Juris Grigorjevs).

TOWARDS CHARACTERISTICS AND MORPHOPHONOLOGY OF INFLECTIONAL MORPHEMES IN LEZGIAN

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Jakobson's hypothesis on distribution of phonemes in affixes has been discussed in scholarly literature from different perspectives. As Jakobson (1966) noticed, inflectional morphemes differ from other morphemes by a restricted and selected use of phonemes and their combinations. Yet inflectional morphemes are less variable in inflectional languages than in agglutinative ones, scholars claim that the key point of Jakobson's hypothesis regards to the latter as well. Another hypothesis that will be examined in connection with the Lezgian language concerns the phonemes in affixes tend to be the less marked segments of the phoneme inventory (Chomsky & Halle 1968).

My research pertains to the Lezgian language, which is described as agglutinative language type (Greenberg 1966; Klimov 1980). The Lezgian language has one of the most complex phonological systems among Daghestanian languages with 54 consonants and 6 vowels in Standard Lezgian; in addition, when it comes to the dialects, this number increases.

Consistent investigation of Lezgian phonology with regard to above mentioned hypotheses defines language specific phonological rules.

In the paper, I analyse the proportion of total number of phonemes with the ones that occur in inflectional affixes both quantitatively and qualitatively.

The use of less marked phonemes in inflectional morphemes could not be qualified as a tendency; furthermore, dental, dento-alveolar, post-alveolar, velar, pharyngeal obstruents occur besides sonorants. I may remark that ejectives and labialized consonants are the least attested phonemes in formation of inflectional affixes. Overall 40 per cent of total number of consonants are used in inflectional morphemes.

Subsequently I describe verbal and noun inflectional affixes in Lezgian and classify them according to their structure, position, and binary oppositions (resp. affixes are basic or non-basic, plain or complex). During the study, the following tendency has emerged. In nouns, the most complex system occurs in declension, particularly in formation of ergative case. On the one hand, various markers are used with the same function (*-di*, *-ni*, *-u*, *-ü*, *-a*, *-ra*); on the other hand, allomorphs of the basic morphemes may occur either only in dialects or be predicted phonologically and semantically, therefore there is no any difference in dialects and the standard varieties in reference to their emergence.

As regards verbal affixes, they content with more or less similar phonemes. Though, in contrary with noun affixes, there are restricted varieties of allomorphs, varied from one another only with different vowels (e.g. a marker of absolute form of verb is *-z*, and its allomorphs (*uz*, *üz*, *az*, *üz*, *ez*, *anz*, *enz*) depend on a vowel in a root, and *-waz*, *-wanz*, *-wenz* which emerge with consonants [g, k, k^h, k', q, q^h, q', x] in a verbal root).

In the paper, I sketch the circumstances under which specific morphophonological processes occur, and exemplify the rules in connection with inflectional morphemes.

SPECTRAL ANALYSIS OF LATERAL SIGMATISMS: PILOT STUDY

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Every spoken voice in its articulation-acoustic dimension has the field in which its realization is manifested as typical (normal) pronunciation, and the field in which its characteristics have manifestations of atypical (pathological) pronunciation. Lateral sigmatism appears due to incorrect routing of air stream in the oral cavity which flows at the edges of the tongue and most often occurs in the pronunciation of fricatives (/z/, /ž/, /s/, /š/) and affricates (/c/, /ć/, /č/, /đ/, /dž/).

The paper presents pilot study with the example of lateral sigmatism. We analyzed the spectral differences of affricate /c/ in case of normal and atypical pronunciation, i.e. pronunciation with lateral sigmatism. The aim was to evaluate whether there are sufficiently large (essential) spectral differences between these two ways of pronouncing the affricate /c/, in order to define discriminatory criteria.

Research methodology included the Global Articulation Test (GAT) and Test for analytical estimation of Serbian language voices (AT) (Kostic et al. 1983). All respondents (children aged 6–7 years) have uttered these words in isolated position, after the pronunciation of the same words by the examiner. Recording was performed in an acoustically processed room in the Life Activities Advancement Center in Belgrade. We used the recorder H4n produced by ZOOM company. Sampling frequency was 44100 Hz, which means that the speech was recorded in the frequency range below 22050 Hz. The stereo recordings were with 16 bit resolution of quantization. All recordings were transferred from stereo to mono mode. This pre-process, followed by a spectral analysis was performed by Praat (Boersma & Weenink 2016). For estimation of long-term spectra classical FFT analysis (Fast Fourier Transform) was used with a frequency resolution of approximately 22 Hz. The frequency range up to 22 kHz is analyzed in detail. Thus, wide range of frequency analysis was selected for observation of higher energy concentrates that reflect affrication (Vojnovic et al. 2010). FFT spectra are transformed into longtime averaged spectrum, in Anglo-Saxon literature known as LTAS (Long Time Average Spectrum). Longtime spectra are by spectral method "smooth" in window width of 500 Hz.

Research analysis of normal fricatives/affricates pronunciation and pronunciations of these phonemes with lateral sigmatism point to differences in the high-frequency part of the spectrum. The cutoff frequency is in the range of 3–6 kHz. The biggest differences in the spectrum are found above this critical frequency. On the basis of the obtained results, it can be concluded that the spectral characteristics of regular fricatives/affricates pronunciation are significantly different in relation to atypical pronunciation of the same phonemes. These spectral differences can be used to create a dedicated software tools that will help the speech therapist in his work but also it could be used by children in individual exercises for pronunciation of critical phonemes.

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IPA EQUIVALENTS OF THE TRADITIONAL PHONETIC ALPHABET FOR LITHUANIAN PHONEMES

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The International Phonetic Alphabet (IPA) equivalents of the traditional phonetic alphabet for Lithuanian phonemes are going to be discussed in the report. Lithuanian linguistics mostly uses its own national phonetic transcription system. If needed, Lithuanian sounds can be transcribed using IPA developed by the International Phonetic Association. It is a standardized, internationally recognized set of phonetic symbols designed to represent and analyse sounds of any languages of the world through the articulatory features of the sounds they represent. IPA system is very useful in comparative linguistics, although there are some inconveniences because of the differences between the national and international phonetic alphabets. Since functional significance is not universal (what is phonologically significant, or relevant, in Lithuanian, could not be so in some other languages), in order to conduct a comparative study of Lithuanian sounds and other sound systems in an objective manner, it is necessary to indicate discrepancies between IPA and the Lithuanian and the chosen language phonetic alphabets.

IPA was used to represent Lithuanian sounds in the academic grammar of the Lithuanian language 'Lithuanian Grammar' (ed. by Vytautas Ambrazas) (LG 1997, 16–17). In the present report, we suggest a slightly modified IPA transcription. The main differences are the following: 1) the IPA equivalent of the Lithuanian short [i] is [ɪ]; 2) the IPA equivalent of the Lithuanian short [u] is [ʊ]; 3) the IPA equivalent of the Lithuanian short [a] is [ɐ]; 4) palatalized consonants are represented not with the diacritic sign as in the 'Lithuanian Grammar', e.g. [tʲ], [dʲ] (in the IPA system, this sign is used to denote labialization), but by adding to the consonant the superscript symbol of palatal approximant 'j', e.g. [tʰ], [dʰ]; 5) Lithuanian consonant [v] is treated as a frictionless continuant, therefore it is represented with [ʋ]. In the 'Lithuanian Grammar' this sound is treated as a labiodental fricative [v] or a bilabial fricative [β]).

The most recent interpretation of Lithuanian consonants in the context of IPA was presented by Ambrazevičius and Leskauskaitė (2014, 164–167). IPA is based primarily on English sounds; therefore it was attempted to adapt the IPA symbols to the Lithuanian language by comparing F2 loci for Lithuanian and English consonants. The symbols of IPA and the classification of Lithuanian consonants that were suggested by Ambrazevičius and Leskauskaitė are different from those to be suggested in the present report.

OCCURRENCES OF CONSONANTS AND VOWELS IN SOUND LINKS DURING THE EARLY PRELINGUAL PERIOD*

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The development of sounds in a child, which is commenced by the function of laryngeal system already with the first cry of the newborn, goes through the range of developmental phases.

The aim of this research was monitoring the occurrence of sound links (consonant-vowel), their combination and determining the frequency in the period of 0–6 months after birth, as well as observing the occurrence of their incidence dynamics in relation to the phonological structure of the Serbian language.

The sample comprised 5 newborn babies, 0–6 months of age, without variables such as: gender, pregnancy and delivery period. The babies were continuously monitored from birth until the end of the sixth month of age. Babies were digitally recorded once a month in relaxed atmosphere at home. The obtained recordings were computerized and auditorily analyzed by expert researchers. The data were entered into tables that present the detailed description of the characteristics of children's voicing, than statistically and descriptively processed.

Based on the result analysis, it can be noticed that sound links (consonant-vowel) appear very early, already in the period of cooing, and that the appearance of these links is more frequent compared to the occurrence of isolated consonants. In the period from 0-6 months of age, 40% of consonants and 80% of vowels appeared in sound links, out of the total number of consonants and vowels in the phonological structure of the Serbian language. We can conclude that the child during the period from birth until 6 months of age, acquires speech observing its general characteristics. Based on these general characteristics, it proceeds towards acquisition of mother tongue. It is justified to expect that the previous experience acquired in this period will play significant role and present a good prerequisite for further development of speech and language.

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**PHONETIC AND PHONOLOGICAL DEVELOPMENT
IN SERBIAN CHILDREN WITH SPEECH AND LANGUAGE
IMPAIRMENT AND ALTERED EEG FINDINGS**

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The delay in speech and language development including phonetic and phonological segment may be an indicator of specific brain areas dysfunction. These data highlight the importance of language examination in relation to central nervous system functions. Research aim was to examine phonetic and phonological development in children diagnosed with speech and language impairment (SLI) who have altered EEG findings. Research sample was divided into two groups of children: E1 group consisted of N=15 children with SLI in the level of speech production and with altered EEG findings which means that subspecific potentials were registered; while E2 group consisted of N=15 with SLI in speech production and with regular EEG findings. All examined children were at the age from 3 to 6 years and they were on intensive speech and language treatment at the Institute for Experimental Phonetics and Speech Pathology (IEPSP) in Belgrade, Serbia. Research methodology included Global Articulation Test from IEPSP Test Battery. The obtained results showed that the children with SLI but with regular EEG findings had better achievements in almost all parts of Global Articulation Test. The most frequent distorted voices in E1 and E2 group were affricates and fricatives. Voice omissions were registered only in E1 group. Results are discussed in relation to gender, type and frequency of pronunciation errors, as well as in relation to altered EEG findings.

ABILITY OF PHONOLOGICAL SYNTHESIS IN EARLY SCHOOL AGE SERBIAN CHILDREN

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Phonological awareness is the ability of phonemes segmentation and knowledge of the phonemes-graphemes relationship and represents the basis of language functioning. It consists of functions that contribute to comprehension of the different ways in which oral speech can be divided into smaller segments. One of these functions is auditory synthesis — the ability to group different phonemes in one spoken word. Ability of phonological synthesis represents one of preconditions for the development and acquisition of reading skills.

The aim of this study was to examine the ability of phonological synthesis of monosyllabic, disyllabic and polysyllabic words in the first and the second grade children from the elementary school.

The sample consisted of 60 children, of which 30 in the first grade, and 30 in the second grade. The percentage of males and females was 40% and 60%, respectively. All subjects were students of the elementary school *Arĭbald Rajs* in Belgrade. We used group of tasks B-2-3: Phonological synthesis of voices from the Diagnostic kit for assessment the ability of speech, language, reading and writing (Bjelica J. Posokhova, 2001) for the assessment of phonological awareness. Testing was carried out at the very beginning of reading training and one year since the training began.

The results showed that the accuracy was 27% in the first grade children and 77% in second grade children. The values of mean scores for the total number of points for all three groups of tasks in first and second grade children show statistically significant difference ($p < 0,05$). Results will be discussed in relation to word length, age and gender.

QUALITY ASSESSMENT OF LINGUISTIC PROCESSING IN RUSSIAN US TTS SYSTEMS

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The paper deals with linguistic processing of Russian unit selection speech synthesizers quality assessment: reading acronyms and abbreviations, numerals, special characters, English words, the correctness of word stress position and grapheme-to-phoneme conversion. Several speech synthesizers with demo versions without background music (Acapela, iSpeech, Ivona TTS, Mary TTS, Nuance Vocalizer, VitalVoice TTS) were selected for the tests. The evaluation was conducted using auditory analysis by the author. Total duration of the sound recordings for every tested synthesized voice was about 40 minutes. Mary TTS open-source speech synthesizer has lower quality than commercial products, which applies to the linguistic processing: it does not read the numbers and Latin characters, acronyms are read as normal words, etc. Test sentences containing the analyzed words or characters were randomly chosen from the Russian National Corpus (<http://www.ruscorpora.ru/>).

Test results are presented in the table below which shows the percentage of test sentences correctly read by different TTS systems:

Speech Synthesizer	Acapela	iSpech	Ivona	Mary	Nuance Vocalizer	VitalVoice
Voice	Alyona	Female voice	Tatyana	Male voice	Katya	Julia
Graphical abbreviations	52	28	32	0	40	79
Acronyms	82	74	78	0	75	99
Numbers	62	59	63	0	62	83
Special characters	95	33	71	0	43	81
English words	100	15	26	0	74	93
Heteronyms (word stress)	66	79	57	46	61	98
Grapheme-to-phoneme conversion	88	44	63	44	50	88

The results are somewhat expected. When carrying out the tasks of linguistic processing linked directly to the Russian language, the VitalVoice TTS system which was developed in Russia primarily for the Russian language shows the best performance. However, when reading foreign-language words and special characters, Acapela speech synthesizer shows the best results which is likely due to the fact that the respective modules can be integrated to the Russian language synthesis from more developed languages. The Russian voice of Mary TTS open-source system expectedly showed the worst result, it was unable to cope with most tasks. Among other commercial systems, linguistic processing quality varies depending on the particular task.

THE AWARENESS OF SILENT LETTERS IN ENGLISH BY TURKISH LEARNERS

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This paper discusses the awareness of silent letters by Turkish speakers of English, whether this awareness correlates with the L2 proficiency level and whether the position in which a silent letter can appear in a syllable, namely onset and coda, influences the awareness. The previous studies show that silent letters are problematic for L2 learners (Akinjobi, n. d.; Jam et al. 2014; Mohammed 2008) but there is no study that focuses on the effect of the proficiency level and the effect of the positions, onset and coda, on the awareness of silent letters. The data about the L2 learners' awareness of silent letters was collected from 60 participants, 30 advanced and 30 beginner learners of English, by means of a reading task. The findings of this study show that Turkish learners of English may not be aware of silent letters regardless of their proficiency levels, the proficiency level contributes to the awareness to some extent and the positions affect the correct pronunciation of words containing silent letters. That is, as Topbaş and Yavuz (2008) state, since Turkish does not allow consonant clusters in onset position, while it allows consonant clusters in coda position of the syllable, these rules about consonant clusters in Turkish might have an effect on the proper pronunciation of words that have silent letters because participants in both proficiency level groups performed significantly better when the silent letter appears in syllable coda in written forms. Besides, advanced participants, who are exposed to English more, perform better than the beginner participants because of the effect of explicit teaching.

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