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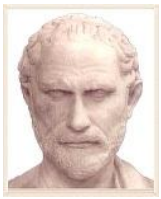

ABSTRACTS

A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z

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PLENARY TALKS

Multilingualism and acquired neurogenic speech disorders

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Acquired neurogenic communication disorders can affect language, speech, or both. If speech is impaired, this can be at the phonetic level, phonological level or both. While neurogenic speech disorders have been researched for a considerable time, much of this work has been restricted to a few languages (mainly English, with German, French, Japanese and Chinese also represented). Further, the work has concentrated on monolingual speakers. In this presentation I aim to outline the main acquired speech disorders, and give examples of research into multilingual aspects of this topic.

The various types of acquired neurogenic speech disorders support a tripartite analysis of normal speech production. Dysarthria (of varying sub-types) is a disorder of the neural pathways and muscle activity: the implementation of the motor plans for speech. Apraxia of speech on the other hand is a disorder of compilation of those motor plans (seen through the fact that novel utterances are disordered, while often formulaic utterances are not). Aphasia (at least when it affects speech rather than just language) manifests as a disorder at the phonological level; for example, paraphasias disrupt the normal ordering of segments, and jargon aphasias affect both speech sound inventories and the link between sound and meaning. There are other acquired disorders (such as progressive speech deterioration) that to some extent cut across these levels of speech production, however.

I will illustrate examples of various acquired neurogenic speech disorders in multilingual speakers, and in lesser reported languages (lesser reported in the context of these disorders), drawn from recent literature. In this respect, I am particularly grateful to my colleagues Nick Miller and Anja Lowit, for their ground-breaking 2014 collection. We will conclude by spending some time considering an example of jargon aphasia produced by a previously bilingual speaker (that is, she was bilingual before the acquired neurological damage). This example consists of non-perseverative non-word jargon, produced by a Louisiana French-English bilingual woman with aphasia. The client's jargon has internal systematicity: There are clear preference patterns in terms of segment frequencies, and sequential properties (preferred syllable structures, and stress assignment in di- or multisyllabic strings). These systematic properties show overlaps with both the French and English phonological system and structure. Therefore, while she does not have access to the lexicon of either language, it would seem that she accesses both the French and English phonological systems.

I conclude by pointing the way forward to the establishment of a Disordered Speech Bank (similar to AphasiaBank) where examples of these acquired speech disorders across languages and from multilingual speakers could be stored and made available for research and education.

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Consonantal phonotactics in SLA: Predictions and reality

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Interest in the acquisition of language had started among philosophers, psychologists, anthropologists, physiologists, and others, long before linguistics became a separate discipline. First came the fascination with child's speech. The early linguistic accounts were provided, for example, by Baudouin de Courtenay (1870), Jakobson (1941) and Leopold (1939, 1947, 1949, 1952). Leopold's study concerned his bilingual children. Baudouin's children were multilingual. Later, around the middle of the 20th century, the interest in second language acquisition by adults developed, originally mainly comparative and oriented on teaching and learning a foreign tongue. The studies dealt with foreign language transfer (starting with Lado, 1957) or bilingual interference (initiated by Weinreich, 1963). Today we deal with cross-linguistic influence in second and third language or in a multilingual setting.

Irrespective of the type of study, a theory of language acquisition is needed, enhanced by a bridge theory from psychology, which would provide basis for predictions concerning the nature of the acquisition process and its results. On the linguistic side, since Jakobson and Greenberg, language universals have guided the research, complemented by language-specific limitations imposed on them. The idea of statistical learning has contributed greatly in the recent decades, not necessarily contradicting the former assumptions (cf. e.g., the most recent publications by Yavaş (ed.) (2015) or Gut et al. (eds) (2015).

In this talk I will concentrate on the SLA of phonology with special emphasis on consonantal phonotactics. The research reported has been conducted within the framework of natural linguistics (Stampe, 1979; Donegan & Stampe, 1979; Dressler, 1985, 1996) with the psychological perspective of innateness, emergentism and self-organization. Predictions have been derived from the theory of Beats-and-Binding Phonology and its model of phonotactics (Dziubalska-Kołaczyk, 2002, 2009, 2014). I will review the results of a number of studies in order to (a) discuss the raison d'être of the formulated predictions (cf. universal preferences vs. statistical analysis of corpora), (b) identify the problematic concepts confusing the analysis (e.g., interference, a native speaker) (c) suggest some helpful extensions of the former (e.g., repair, a prototypical native speaker). The main exercise ground for the above discussion will come from the investigation of the influence which universal phonotactic and morphonotactic (Dressler & Dziubalska-Kołaczyk, 2006) preferences have on the acquisition of consonant clusters in a second language.

Keywords: phonotactics, morphonotactics, beats-and-binding phonology, acquisition

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Cross-linguistic interaction in early bilingual phonology: A retro- and prospective view

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This presentation reviews past and present studies comparing the phonetic and phonological development of monolingual and bilingual children. Whereas research in other linguistic domains, such as lexical development, often shows that bilinguals lag behind monolinguals when measured in one of their languages (Hoff, Core, Place, Rumiche, Señor, & Parra, 2012), the findings are different in the phonetic/phonological domain. Studies taking either a linguistic or clinical perspective provide evidence for varied patterns including delay, acceleration, transfer and the possibility of no interaction in bilinguals' speech production in comparison to monolinguals' (see review by Hambly, Wren, McLeod, & Roulstone, 2013). To determine what may explain these variable patterns, I explore the relative importance of internal factors (e.g., frequency, complexity and presence or absence of the linguistic structure in the languages of the bilingual) and external factors (e.g., language dominance and family language dynamics) on bilingual phonological development (see model by Lleó & Cortés, 2013). The ability of these factors to predict speech outcomes is examined with respect to past research findings and is tested with respect to new data sources: case study data (two trilingual children acquiring French as one of their languages), a small group study of German-Spanish bilinguals (n=3) and a larger group study of French-speaking bilingual children (n=20). The linguistic phenomena under consideration are acquisition of /r and l/, phonological rhythm, in particular, vowel reduction, and syllable structure (codas and onset clusters). These phenomena are selected to contrast the differing effects of complexity and frequency. The larger group study serves as a means of studying the influence of external factors on phonological performance. The main finding is that all factors may explain cross-linguistic interaction patterns on a study-by-study basis but their effects are not necessarily generalizable across a wide range of studies. This observation leads, in the final part of the talk, to an examination of future models and methodologies for studying cross-linguistic phonological interaction in young bilinguals.

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Disentangling the effects of long-term language contact and individual bilingualism: The case of lexical stress in Welsh English

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The phonetic properties of bilinguals' speech productions are commonly found to interact (e.g., Flege & Eefting, 1987). Prolonged and systematic cross-language interactions in bilingual communities may lead to the emergence of contact varieties (e.g., Bullock & Gerfen, 2004). For example, Welsh and Welsh English share many accentual features that are commonly reported to result from long-term contact between the languages. While the English accents of the largely monolingual areas in South-East Wales are well documented (Mees & Collins, 1999), little is known about the varieties of English spoken in bilingual areas.

This paper aims to determine (1) the extent of mutual influence between Welsh and Welsh English accents; (2) the role of individual linguistic experience in these cross-linguistic interactions; and (3) possible differences in the pronunciation of Welsh English by monolinguals and bilinguals from the same community. To this end, lexical stress data were collected from three groups of male adolescents attending the same secondary school in Carmarthenshire, where subjects are taught in either English or Welsh: Welsh-English bilinguals from Welsh-speaking homes; Welsh-English bilinguals from English-speaking homes; and (iii) English monolinguals.

Welsh is reported to have unusual stress cues; unlike most European languages it reportedly does not signal stress by longer vowels, higher fundamental frequency (F0), and higher amplitude on the stressed syllable. Instead, it is claimed that the immediately following consonant is lengthened, with the F0 change occurring on the following unstressed syllable (e.g., Williams, 1985).

Results showed clear cross-language differences with shorter stressed vowels, longer post-stress consonants and unstressed vowels, and smaller F0 differences between stressed and unstressed syllables in Welsh than in English. Linguistic experience, however, was found to affect the realisation of acoustic stress correlates differently: while there was evidence for an effect of linguistic experience on F0, no such effect was found for any of the durational cues. The implications of these findings for theories of cross-linguistic interaction in language contact situations will be discussed.

Keywords: lexical stress, socio-phonetic variation, language contact, Welsh-English bilingualism, prosody

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Evaluating native-likeness of bilingual speech

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Evaluating bilingual speech with respect to the monolinguals of the two languages involved has been a controversial issue. Native likeness of L2 productions has been measured differently in different studies. While some report nativelikeness through speakers' 'self-identification' (Piller, 2002; Seliger, 1978), others have argued for the need of perceptual judgments made by monolingual native speakers of the language in question (Bongaerts et al., 2000; Neufeld, 2001). Self-identification can be disregarded because it is an unreliable measure of nativelike L2 competence (Abrahamsson & Hyltenstam, 2009; Birdsong, 2007). Perceptual judgments by native speakers may not serve as a reliable tool either, because in many cases of the speech of very fluent L2 dominant bilinguals, the distinction between near-nativeness and actual nativelikeness cannot be captured. Thus, the frequently encountered imperceptible nonnativeness of the seemingly very advanced (balanced) bilingual productions should be investigated through rigorous and detailed linguistic analysis (Stolten, Abrahamsson, & Hyltenstam, 2015).

In this talk, I will report on results that we have obtained from several studies of Spanish-English bilinguals from South Florida where bilingualism is very much alive. The particular studies that will be examined will include bilinguals' English productions in 'flapping', 'reduced vowels', as well as the renditions of the 'voiceless stops' and 'laterals', in their two languages. The data under examination come from early sequentisal bilinguals (university students in their early twenties) who acquired their L2 (English) before puberty, and in most cases around age 4:00. Almost all participants are English dominant and have greater use of English in their daily lives and are frequently judged native-like in perceptual experiments. Acoustic analyses of data from these studies, however, reveal that in many instances, significant differences exist between the productions of monolingual speakers and these very fluent bilinguals. Results may be interpreted as supporting of several studies that have shown a lag of even a few years in acquiring an L2 tends to have dramatic consequences on speech production (Flege, Munro, & MacKay, 1995; Flege, Yeni-Komshian, & Liu, 1999; Fowler et al., 2008) and perception (Flege & MacKay, 2004; Sebastian-Galles & Soto-Faraco, 1999). They may also point to the importance of in/sufficient native input, as successful attainment undoubtedly relies on optimal levels of input, quantitatively and qualitatively.

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SPECIAL LECTURE

Same challenges, diverse solutions: Outcomes of a crosslinguistic project on monolingual phonological acquisition

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Our crosslinguistic study of phonological development has been underway since 2006, including 12 languages from 13 countries: Romance (French, Spanish, European Portuguese); Germanic (German, Canadian English, Swedish, Icelandic); Semitic (Kuwaiti Arabic); Asian (Mandarin, Japanese); South Slavic (Slovene, Bulgarian). Assessment tools have been created for four additional languages or dialects: Tagalog (Austronesian), Punjabi (Indo-Aryan), Ojibwe (Algonquian, First Nations, Canada), Brazilian Portuguese (Romance). The objectives of the study are to: (1) document and (where possible) explain similarities and differences between languages in development of word structures, consonants and vowels in children, both typical developing (TD) and with protracted phonological development (PPD), and (2) develop assessment tools for speech-language therapists in a variety of languages, both for elicitation of speech samples and for analysis. The framework for the study derives from nonlinear phonology, and focuses on a child's strengths and needs across the phonological hierarchy, from the phonological phrase and word, through feet, syllables and timing units (Cs, Vs), to segments and their phonological features. For the study, lists of approximately 100 words representative of each language's phonology were developed for elicitation by each language team in consultation with the project leaders. The lists are designed to sample all consonants and vowels, simple and complex structures (in syllables, feet, phonological words), and words of varying length, balancing for particular consonants and vowels in all positions; the exact number of words in each list varies do to differing characteristics in each language. Data were audio- and sometimes video-recorded from children aged 3-6 (TD, PPD). Transcription conventions were developed for each language working with native-speaker partners. Analyses were conducted using two computer analysis programs designed for phonological development (CAPES; Phon) and spreadsheets. Comparison of data across languages presents its own set of challenges, with one question being to what extent two very different languages can be compared. This presentation will highlight key areas of investigation, methodological considerations in comparative analysis and findings to date both within and across languages. Within-language data will be exemplified with Mandarin (consonant categories, vowels, word shapes) and Spanish (word structure development). Comparative data will be presented for rhotics and laterals across a variety of languages with tap and trill, and for fricatives within Germanic languages (German, English and Icelandic). Major findings of the study to date suggest that children are subject to similar types of constraints across languages in speech production. However, the inventories of the language (word length, stress, syllable complexity and segmental inventory) and relative frequencies of structures and phonemes provide different opportunities for resolving those constraints and relative rankings over the developmental period. The session will end with an introduction to the project website which provides assessment materials and analysis and intervention tutorials free through the web.

Keywords: crosslinguistic, monolingual, nonlinear phonology, typical and protracted development

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CONTRIBUTED PAPERS

The relative perceptual weight of two Swedish prosodic contrasts

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In addition to 9 vowel and 18 consonant phonemes, Swedish has three prosodic phonemic contrasts: Word stress, quantity and tonal word accent. There are also examples of distinctive phrase or sentence stress, where a verb can be followed by either an unstressed preposition or a stressed particle. This study focuses on word level and more specifically on word stress and tonal word accent in disyllabic words. This is an area that needs more research (cf. Elert, 1970; Bruce, 1977; Abelin & Suomi, 1996; Thorén, 2008). When making curriculums for second language learners, teachers are helped by knowing which phonetic or phonological features are more or less crucial for the intelligibility of speech and there are some structural and anecdotal evidence that word stress should play a more important role for intelligibility of Swedish, than the tonal word accent. Swedish word stress is about prominence contrasts between syllables, mainly signaled by syllable duration, while tonal word accent is signaled mainly by pitch contour. The word stress contrast, as in ˈ*armen* 'the arm' - *arˈmen* 'the army', the first word trochaic and the second iambic, is present in all regional varieties of Swedish, and realized with roughly the same acoustic cues, while the tonal word accent, as in ´*anden* 'the duck' - `*anden* 'the spirit' is absent in some dialects, and also signaled with a variety of tonal patterns depending on region. The present work aims at comparing the respective perceptual weight of the two mentioned contrasts.

Two lexical decision experiments were performed, where, first,18 native Swedish listeners were exposed to 10 trochaic (accent 1) words, and 10 originally trochaic words pronounced with iambic stress patterns, 10 iambic words, 10 tonal accent words, 10 originally tonal accent words pronounced with trochaic stress pattern, and 60 disyllabic nonsense words. In the second experiment 18 other native Swedish listeners were exposed to the reversed distorted feature; either stress allocation or word accent category. The subjects were instructed to judge as quickly as possible whether the words they heard were real words or not. The results show that distorted word stress caused more non-word decisions, and a higher loss of answers due to prolonged reaction times, than distorted word accent. Our conclusion is that intelligibility of Swedish is more sensitive to distorted word stress pattern, than to distorted tonal word accent pattern. This is in compliance with the structural arguments presented above.

Keywords: word accent, word stress, intelligibility, lexical decision-experiment

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Bilingual school children's speeches on their literacy activities

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Attaining literacy is a major milestone in human development with ramifications for success in school and general quality of life (Datta, 2000). This paper aims to consider bilingual school children's speeches on literacy practices in the perspective of Hornberger's (1989) interrelated continua of biliteracy development. The study deals with bilingual children in Mayotte, a former French colonial possession in the Indian Ocean, where 7 languages are spoken, French being the official and the only school language. While previous research on Mayotte mainly focused on language use and repertoire of school children (Laroussi & Liénard, 2011) or on teachers' attitudes towards language use in classrooms (Laroussi, 2009), children's speech during their literacy practice is rarely investigated.

Due to insufficient proficiency in French, school failure is a real problem in Mayotte. Compared to results of the French mainland, pupils in Mayotte show significant differences in a negative way on 5th grade National Achievement Assessments. Politicians and teachers agree that this failure is related to the deep inequalities that these children encounter. Upon starting school, children are submerged into an education system where French is the medium of instruction often without any prior knowledge of French. In Mayotte, local languages have no written form; and consequently, children are multilingual in spoken language but monolingual in the written language, that being French.

In the framework of our research project on educational and language policies in Mayotte, we designed a short questionnaire (socio-economic background, use of languages within and outside the home), a written evaluation of a reading test and a semi-guided interview (on literacy practices in out of school activities). We collected data from 225 multilingual school children attending 6th and 7th grades (mean age: 12 years-old). The purpose of our paper is to present the analyses of the semi-guided interviews we did with 7 of the participants. This data allows us to answer the following questions:

1. What kind of literacy experiences do bilingual children have outside school?
2. What is the relationship between language, culture and literacy?
3. What are the characteristics of these bilinguals, their environments, the contexts in which they receive instruction, and the nature of this instruction with regard to reading and writing activities?
4. What resources do they access, what literacy practices do they engage in on their own?

On the basis of descriptive statistics, a global description of the findings was made. These findings aim to help in the development of social structures and pedagogical approaches targeted at improving bilinguals' motivation to engage in conventional literacy activities, thus contributing to their success beyond schooling in the context of multilingual Mayotte.

Keywords: multilingual education, Mayotte Island, literacy, language practices

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A perspective into noun-before-verb bias: Evidence from Turkish-Flemish bilingual children

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Nouns and verbs are considered as fundamental categories of lexical development from both linguistic and cognitive perspectives (Kauschke et al., 2007). From linguistic point of view, nouns and verbs are the lexical units which categorically highlight language-general and language-specific characteristics. Cognitive representations of nouns and verbs are also significant to consider in terms of acquisition of early lexicon. The aim of this research is, therefore, to investigate the Turkish-Flemish bilingual children's early language period especially in terms of two syntactic categories; namely, nouns and verbs. Besides, the differences of typological characteristics between Turkish and Flemish are striking in terms of nouns and verbs. In addition to the linguistic and typological motivations, methodologically, this research utilizes a very fruitful data collection tool, Turkish and Flemish version of CDI-Communicative Development Inventory, which has become an acceptable tool to use in bilingual language acquisition studies (David & Wei, 2003; Xuan & Dollaghan, 2012; De Houwer, 2006; Marchman & Martinez-Sussman, 2002). In line with this background, this study aims at analysing the nature of Turkish-Flemish bilingual children's early lexicon with respect to noun bias phenomenon by means of data collected with 20 Turkish-Flemish bilingual children living in Flanders.

The results of this study, of which analysis of data is still in progress, will be evaluated regarding the early trajectories of bilingual children's lexical acquisition with respect to noun-before-verb pattern, which is a challenging approach generating a great number of related research in the crosslinguistic arena for a long time, directly linked to two different perspectives: the Universal Noun Advantage View versus the Input Dependent View. The findings of this study will highlight whether the noun bias is accounted for a language-general or language-specific constraint.

Keywords: noun bias, early bilingualism, CDI, noun-before-verb bias

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Language acquisition in childhood Obstructive Sleep Apnea Syndrome

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Obstructive Sleep Apnea Syndrome (OSAS) is a condition in which the upper airway becomes blocked repeatedly during sleep, resulting in increased respiratory effort and snoring, recurrent hypoxia, and frequent arousals from sleep. Sleep disorders in children are associated with reduced attention problems, hyperactivity, impulsivity and learning difficulties (Gozal, 2008). The prevalence of OSAS in children ranges up to 3% in different epidemiological studies and the incidence peak was found in pre-school children, during the most critical age for language acquisition (Balbani, 2005). Moreover, several studies show that language acquisition is also affected by the occurrence of OSAS (Kurnatowski et al., 2006), but until now research has mostly examined the general language ability without focusing on specific language areas. Therefore, our goal is to investigate which language areas are mostly affected by this Syndrome during early childhood.

In the present study participated 25 children with OSAS (according to polysomnography examination performed at the University Hospital of Larissa, Greece) aged 4.1 to 6.11 (Mean CA: 5,6) years old and 25 typically developing children (TDC) of the same chronological age. Language performance was tested using a standardized psychometric language test (L-a-T-o I) created for the Greek language focusing on the areas of phonology, morphosyntax and semantics. Children with OSAS had lower overall performance in general language ability compared to the TDC. More specific OSAS children showed significant difficulties in coping with complex phonological and morphosyntactic tasks, such as phonemic integration, phonemic analysis and morphosyntactic integration of the L-a-T-o I test.

Our findings are consistent with the literature findings indicating that OSAS affects language acquisition in early childhood (Halbower et al., 2006; Gozal et al., 2008), as a result of breathing disorders during sleep, nocturnal intermittent hypoxia and frequent arousals. Moreover, our results extend the findings of the literature by focusing on the language areas that seem to be most problematic in children with OSAS and suggest that, along with medical treatment, early language intervention is also necessary.

Keywords: Obstructive Sleep Apnea Syndrome, children, phonology, morphosyntax

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Phonological development in Kuwaiti monolingual and bilingual preschoolers

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This study compares phonological acquisition of typically developing monolingual and bilingual Kuwaiti preschoolers. The question was whether monolingual Kuwaiti Arabic-speaking speakers (Ayyad, 2011) would show more advanced development than sequentially bilingual Kuwait Arabic-English speakers, who have to split attention between two independent phonological systems (e.g., Chan, 1999), or whether bilingual speakers would be more advanced, benefiting from a rich language learning context (a possible implication of the Interactional Dual Systems Model: Paradis, 2001). Speech samples were collected from 80 monolingual Kuwaiti Arabic-speaking children and 10 bilingual Kuwaiti-Arabic-English speakers in the state of Kuwait. Participants were aged 3;10 to 5;2, an age range when near-mastery of the phonological repertoire could be expected. For Kuwaiti Arabic, an 88-word list from Ayyad (2011) was used for elicitation with a variety of word lengths and structures and including vowels and consonants across word positions. For English, a standard word list from CAPES (Masterson & Bernhardt, 2001) was used, with similar levels of complexity as the Arabic sample. The first author, a native speaker, audio-recorded the samples with an M-Audio Micro Track II 24/96 recorder (Beier TGX 58 lapel microphone), and transcribed the monolingual data. The bilingual sample was transcribed by senior speech-language pathology students in Kuwait, who are native speakers of Arabic and second language speakers of English. Reliability was checked on 10% of the samples by phonetically trained transcribers. A nonlinear phonological framework (Bernhardt & Stemberger, 1998) was adopted for analysis of word structures, consonants and features. A preliminary comparison of the speech samples shows that both groups have rich consonant inventories across places of articulation, including emphatic and non-emphatic stops, nasals, approximants and uvulars and pharyngeal fricatives. Several word shapes and lengths appear to be acquired by this age, from one to four-syllable words. Some bilingual participants have more advanced phonological acquisition than the monolingual ones. Fricatives, affricates and trilled /r/ and morphophonemic alternations continue to undergo development, especially for the monolingual sample. Results will be discussed in terms of theories of bilingual acquisition.

Keywords: Kuwaiti Arabic, monolingual, bilingual phonological development

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Consonant clusters by excrescence in monolingual and bilingual child speech

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It is widely known that children address syllable complexity in the acquisition of consonant clusters by employing simplification methods. The reverse phenomenon of the production of consonant clusters by excrescence (CCE), whereby a consonantal sequence of a non-targeted consonant and a targeted consonant, /C_1/→[C_2C_1] or /C_1/→[C_1C_2]), seemingly unnecessarily and unnaturally increases word complexity in a developing phonology has received little attention in the literature. Though sparse data traced in several studies of both normal and phonologically disordered children provide support of the universality of the phenomenon occurring in within-word and at-word-boundary contexts cross-linguistically (e.g., Edwards & Bernhardt, 1973; Leonard, 1985; Vihman, 1996; Szreder, 2011), comprehensive analysis to date has been in the light of child non-systemic speech errors similar to those made by adults (Stemberger, 1989), but has not been linked to developmental factors. The present study tackles the phenomenon anew utilizing a typically developing Greek-English bilingual child's longitudinal data over a period of 17 months of phonological development from age 2;7 to 4;0. Although the /C_1/→[C_1C_2] pattern is reported predominantly preferred over /C_1/→[C_2C_1] in child speech errors paralleling adult speech error tendencies (Stemberger, 1989), the latter pattern is found amply effective in the child's English and Greek data and forms the center of analysis here; to eliminate word boundary effects, only utterance-initial sequences of /#C_1/→[#C_2C_1] are examined. The analysis reveals that: (a) CCE is lexically independent, (b) CCE is age dependent with its frequency of occurrence advancing between 2;7-3;1, peaking at 3;2-3;6, and receding but not totally disappearing after 3;7, (c) production of C_1 and C_2 is concomitant with the level of acquisition of respective singletons, (d) C_2 production is dictated by both purely articulatory and phonological factors, (e) C_2 is also influenced by the wider phonological environment outside the word involving the CCE (i.e. child and interlocutor utterances) by processes of anticipation, priming, and metathesis, (f) there is lower and higher level systematicity and patterned regularity in the formation of CCE that does not always adhere to phonotactic rules of ordinary consonant cluster production in each language. Thus, it is argued that CCE is suggestive of a systemic developmental process. At a time when targeted /CC/ is in the process of being actively acquired in the child's system, the use of the [#CC] production template is overgeneralized in erroneous contexts, as if the child is practicing it, giving rise to seemingly unnatural consonant clusters by excrescence. The phenomenon described is consistent with overgeneralization as a typical occurrence in child speech development (e.g., Dinnsen, 1992), and supportive of theoretical propositions upholding the primacy of faithfulness to adult target word proximity over secondary contextual considerations (e.g., Ingram & Ingram, 2001).

Keywords: speech development, excrescence, consonant clusters, bilingualism, overgeneralization

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Selective attention to features in foreign vowel perception

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This paper argues that there is an interplay of categories and feature clusters in foreign language speech perception, and points to the core features which determine foreign language speech perception. So far second language speech perception has been analyzed in terms of (a) assimilations of these first language sounds which are similar to second language sounds or (b) new category formation for definitely different sounds (Flege, 1995; Best, 1995, Best & Tyler, 2007). Pajak and Levy (2014) postulate an important role for selective attention to features in L2 speech perception, which in addition to categories, might be used in L2 speech perception even if the context for using these features is different. This paper elaborates on their hypothesis and postulates that in addition to categories, certain feature combinations are crucial for faithful foreign vowel perception.

Perception experiments have been designed with the aim of testing whether the acquisition of L2 with specific vowel features facilitates the perception of foreign language vowels with the same feature used in different contexts (cf. Bohn & Best, 2012). The experiments examine perception of Dutch vowels by Polish advanced students of Dutch, English and Italian in comparison to the first and second language vowel perception. The choice of languages serves the purpose of examining the role of features related to acoustic characteristics of vowel quality, tenseness, duration and lip rounding. Dutch has an extensive vowel inventory with front unrounded, front rounded and back rounded vowels. Dutch vowels are also distinguished by length and tenseness. English does not have front rounded vowels, but it uses length and tenseness as features specifying vowel categories and it has low vowels. Italian has a simple seven-vowel system. The hypothesis is that learners of Dutch should be the best at perceiving the vowels of Dutch, especially the front rounded vowels, but English learners should be better at perceiving vowels from the Dutch inventory than learners of Italian, because the latter have not mastered vowel perception in a crowded vowel space. Cross-speaker categorical discrimination tests (Levy & Strange, 2008) have been administered. The results support the hypothesis and point to the vital role of the tongue height and lip rounding in foreign vowel perception.

Keywords: second language speech perception, vowel inventory, selective attention to features, Dutch, English, Italian

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Automatic speaker detection for improved multi-level annotation of children speech database

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There are various child speech databases mainly in English for researchers to analyse children's speech production (e.g., Kids' Audio Speech Corpus, TBALL, SPECO). In the last decade, the development of child speech databases has started for Hungarian as well (MONYEK, GABI). Manual annotation of large spoken language corpora is a very time-consuming and tedious task, therefore automatic speech technology tools can be useful for improving it.

The aim of our future project is to provide multi-level annotations for Hungarian children speech databases supported by speech technology tools. The multi-level labelling is planned to contain four levels: speakers' turns, intonational phrases, words, and phonemes. The goal of the present research is to build a speaker diarization system which can automatically mark speaker changes based on acoustic information in Hungarian spontaneous conversations of children. In order to improve the speaker diarization, we used voice activity detection and detection of overlapping speech as well. In the literature, extensive research is described for speaker diarization, but principally for English (Jin et al., 2004; Cheng et al., 2010). However, no work is known which addresses speaker diarization in Hungarian.

In this study, we built an unsupervised, BIC-based (Bayesian Information Criterion) speaker segmentation algorithm combined with KL2 (Kullback-Leibler) distance for reducing the number of false change points. We used a DNN/SVM system to detect overlapping speech. In each task, MFCCs were used as feature extraction methods. The study was carried out using the speech material of 70 children (five age groups: 6-, 7-, 9-, 11-, 13-year-old). None of the children had any hearing disorder, and their intelligence fell within the normal range. The total duration of the corpus was 371.2 minutes. The corpus was recorded in kindergarten and at school. The children were recorded one-by-one. We used different speech samples from all children for the training and testing sets. Speaker diarization performance was measured by DER (Diarization Error Rate). It is found that the 7-year-olds' group yielded the best result (DER 51.72%) yielded. In the case of the 6-year-olds, the DER was the highest, 59.7%. The same system was tested on an adults' spontaneous speech database (BEA Hungarian database). In this case, the DER was about 30%, which is better than in child spontaneous speech. We suggest that this difference might be due to the greater amount of intra- and inter-speaker variability in children-adult conversation compared to adult-adult conversation.

In this paper, we have motivated the support for speaker diarization in the audio corpus annotation task and have described our first efforts toward developing a system to improve multi-level annotation of children's speech database.

Keywords: speaker diarization, children speech, multi-level annotation, deep neural network

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Fronting and backing in children with speech sound disorders

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Studies on children with Speech Sound Disorders (SSD) indicate that 'velar fronting' (/k, g/→/t, d/) and 'alveolar backing' (/t, d/→/k, g/) are quite frequent phonological processes. However, in typical phonological development, 'alveolar backing' is relatively rare (Bosma Smit, 1993; Lowe, Knutson, & Monson, 1985). This is not surprising since phonological markedness implies that alveolar stops are less marked than velar stops and therefore alveolars should be acquired earlier than children. Thus, in the case of substitution, the direction should be from marked to the unmarked (/k, g/→/t, d/). These are the main reasons for categorizing 'alveolar backing' as an atypical phonological process (Khan, 1982).

The aim of the present study was to investigate the differences between children with SSD who show 'velar fronting' with those who show 'alveolar backing'. The participants were 30 Hebrew-speaking children with SSD between the ages 3;6 and 5;5. The participants were divided into a 'velar fronting' group (15 children) and an 'alveolar backing' group (15 children). The groups were compared for motor and oral-motor abilities, oral structure, pacifier using, eating habits, auditory discrimination, history of middle ear infusion/inflammation, pregnancy and delivery history and language development.

The results revealed a relationship between children with 'alveolar backing' and the use of pacifier, lower oral-motor abilities, and problems during pregnancy and delivery. These results may imply that the process of 'alveolar backing' is motor-based and therefore it should be treated as such.

Keywords: backing, velar fronting, speech sound disorders, oral-motor abilities

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Acquisition of diphthongs in Mandarin and Granada Spanish

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Diphthong acquisition is relatively understudied. During development, diphthongs (V1V2) may show reduction to either V1 or V2, and/or feature changes. When reduced to single vowels, the more prominent (longer) element generally surfaces, i.e. V1 of a falling diphthong (e.g., /ai/) or V2 of a rising diphthong (e.g., /ia/). The single vowel produced may or may not maintain both timing units (length) of the target diphthong (Bernhardt & Stemberger, 1998). Comparing diphthong types, some studies show later mastery of rising diphthongs (To et al., 2013: Cantonese). Developmentally, V1 of rising diphthongs may be treated as part of an onset cluster rather than as part of the nucleus (Kehoe et al., 2008: French and Castilian Spanish). Mastery of diphthongs thus may entail representational change in syllable structure (onset to nucleus) and the ability to handle complexity in the nucleus. The current paper extends the study of diphthong development to Mandarin and Granada Spanish. Both languages have rising and falling diphthongs and minimal coda use. The low frequency of codas (reduced postnuclear complexity) was predicted to result in vulnerability for falling diphthongs in both languages. Differences between languages were expected as a result of the larger vowel inventory of Mandarin and the greater structural complexity of Spanish (onset clusters, longer monomorphemic words, diverse stress patterns), i.e.: (1) more diverse feature change patterns in Mandarin; (2) Spanish showing patterns for rising diphthongs similar to those in onset clusters, as in Kehoe et al. (2008); and (3) vulnerability of diphthongs in Spanish unstressed syllables, especially word initially. Participants for the study included: (a) for Mandarin, 29 children aged 3 to 5 years with protracted phonological development (PPD) and 30 typically developing (TD) 4-year-olds; and (b) for Spanish, 29 children with PPD and 30 TD children (aged 3 to 5 years). Native speakers collected and transcribed standardized single word elicitations as part of a crosslinguistic study evaluating multiple aspects of the phonological system. Preliminary analyses support predictions, particularly for children with PPD. Falling diphthongs were vulnerable across languages, although timing units for the rime were often maintained. Rising diphthongs were somewhat more well-established in Spanish than falling diphthongs, especially for children with /l/-clusters, and in stressed syllables. The comparison of monolingual development in two unrelated languages contributes to the relatively limited study of vowel development, addressing age, participant and language variables.

Keywords: diphthongs, monolingual, Granada Spanish, Mandarin, phonological

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Production of object relatives in bilingual acquisition: L1 Russian, L2 Hebrew

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Despite their complexity, acquisition of relative clauses (RCs) across languages is reported to be completed around 6;0 (Hamburger & Crain, 1982). A fundamental question arises as to whether bilingual acquisition affects the acquisition of RCs in the two languages, and if so, in what way? Assuming sequential bilingualism, and taking into account that this process may develop on the grammatical basis already available in L1, or involve attrition of L1's competence, four hypotheses are plausible.

1. L2 delayed; L1 on time
2. Both delayed
3. L1 delayed; L2 on time
4. No delay in both languages

25 Russian-Hebrew bilingual children (L1 Russian), age 6 at first testing, participated in a two-phase study, a year apart. Four object relatives were elicited as part of a sentence repetition task with 36 sentences, matched in length and complexity.

At first sight, our findings seem to support Hypothesis 3, as the success rate of L1 is lower than L2 (67% vs. 97%). However, an examination of the attested errors suggests that the correct Hypothesis is 4. We argue that the most prominent error, nominative operator (*kotor**iy***-masc*/kotor**aya***-fem) instead of the accusative one (*kotor**ogo***-masc*/kotor**uyu***-fem), attested on both testings (1st 32.5%; 2nd 36.8%, out of errors**)**, indicates children's competence in the derivation of Russian RCs, albeit with sporadic failure to retrieve the correct form of the operator, using the default one (nominative). Importantly, the nominative error was significantly more prominent in a sentence with an animate, masculine relative head (e.g., 'father') (1st testing $p < 0.01$; 2nd testing $p<0.001$). In this type of sentence the accusative form of the operator (*kotor**ogo***) differs substantially from its nominative counterpart (*kotor**iy***), both prosodically (number of syllables) and segmentally. Plausibly, this finding reflects a performance error, rooted in the speech production mechanism rather than attrition of L1's competence.

Our study highlights the importance of differentiating speakers' errors, supporting the view that bilingualism does not delay grammatical development.

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Giving a hand to non-native speakers: The relation of pitch and gestures in L2

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It is known that gestures are interrelated with speech at the semantic, pragmatic and phonological level (McNeill, 2005). Gestures also appear to be coordinated with prosodic prominence - though it is not yet clear how (e.g., Kendon, 1980; Bull & Connelly, 1985; Loehr, 2004). The relation between speakers' gestures and variations in pitch has received little attention, but it is highly likely that they too might be interconnected.

It has been suggested that L2 speech may be characterized by limited pitch variation and a narrower pitch range than L1 speech (Hincks, 2004, 2005; Mennen, Schaeffler, & Docherty, 2008, 2012; Aoyama & Guion, 2007; Pickering, 2004; Ullakonoja, 2007). The differences in pitch range in L1 and L2 may be due to L2 speakers' lack of proficiency in the target language, and may be more evident in particular speaking styles, such as formal presentations (Hincks, 2004, 2005; Johns-Lewis, 1986). As for gestures, it has been claimed that bilingual speakers might gesture more than monolingual speakers, as gestures would help them formulate their spoken message, i.e., as a way to compensate for the reduced proficiency in the L2 (Nicoladis, Pika, & Marentette, 2009). Thus, it would seem that speakers' use of pitch and gestures in the L2 might differ from speakers' use of pitch and gestures in the L1, and be related to language proficiency level. However, it is not known how pitch variation and use of gestures are interrelated and how they are affected by second-language learning.

In this study, we compare the pitch variation and gesture rate of non-native English speakers, telling the same story once in their native language and twice in English. The hypotheses tested are that narrow pitch range and reduced gesturing are related; that learners' narrow pitch range is associated with reduced gesturing; and that gesturing increases with increased pitch variation. This study also investigates cross-linguistic differences in gestures use. To test our hypothesis, 14 English learners (8 Italians, 4 Chinese, 2 French) with a competence at the B1 level of the CEFR, were video-recorded while telling Aesop's fable "The Fox and the Crow", once in their L1 and twice in English, as part of an in-class oral presentation task. The audio signal was analyzed with the software for acoustic analysis *Praat*; the videos were analyzed with the multimodal annotation software, *ELAN*.

The preliminary results show that there is a direct relation between speakers' gesturing rate and pitch variation, though cross-cultural differences exist in the use of gestures and pitch in the story telling task. This study will constitute the basis for further analyses on the interaction between gestures and speech development in L2.

Keywords: gestures, transfer, L2 learners, English L2

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The effect of consonant training on the perception of vowel sounds: A cross-training study

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Several studies involving L2 phonetic training have had positive results (Wang & Munro, 2004; Hazan et al., 2005; Iverson & Evans, 2007; Aliaga-García & Mora, 2007; Cebrian & Carlet, 2014) and have shown that phonetic training has a positive effect on the ability to correctly perceive the sounds of a second language.

The present study further investigated the effect of two high variability phonetic training methods that aimed at improving the perception of the English stop consonant sounds [p, t, k, b, d, g] by Spanish/Catalan bilingual learners of English. The main questions that drove this study were (a) whether there is a positive effect of training on the perception of the L2 consonant (trained segments) and vowel sounds (untrained segments) by Spanish/Catalan speakers and (b) which training method (Identification or Discrimination) is more efficient in promoting improvement on trained and/or untrained segments.

60 learners of English as an L2 took part in a pre-test/training/post-test study that lasted 7 weeks and were assigned to one of three training methods (forced-choice identification training, AX discrimination training and control group). Consonant training was administered over 5 sessions and included CVC nonsense words naturally produced by 4 different native speakers of southern British English. All stimuli contained one of the 6 English stop consonants either initially or finally, and one of the 7 selected English vowels /æ, ʌ, ɪ, i, ɜː, e, ɑː/ in a balanced design. Learners were exposed to both contrasts involving the trained segments (consonants) and contrasts involving untrained segments (vowels) throughout the training regime. For example, the stimuli *dadge, tadge, dudge, tudge* were used to train the initial stop consonant contrast /d, t/, while providing a balanced exposure to the vowels /æ, ʌ/. Pre- and post-tests involved consonant and vowel identification of nonsense words produced by two novel speakers. Post training identification revealed a positive effect of phonetic training on the trained segments for both experimental groups, as they outperformed the controls in their improved identification of consonants. No significant difference was found between the two perceptually trained groups, indicating that both methodologies improved L2 perception of consonant sounds similarly. Interestingly, only the discrimination trainees improved their perception of vowels significantly. These results suggest that both identification and discrimination training methods are efficient in improving consonant perception to a similar extent, in line with previous findings (Flege, 1995). However, discrimination training may be better at promoting improvement on untrained segments.

Keywords: phonetic training, L2 perception, English stop consonants

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Non-native perception of voiceless English stops

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Difficulty to perceive English stop consonants in a native-like manner on the part of Romance language learners of English has been widely reported (e.g., Aliaga-Garcia, Mora, 2009; Flege & Eefting, 1988). Previous studies have also shown that the perception of an allophonic contrast in complementary distribution such as the English aspirated-unaspirated voiceless stops tends to be less accurate than a phonetic contrast (e.g., Boormershine et al., 2008; Celata, 2009; Whalen, Best, & Irwin, 1997). Perceptual difficulties have been associated with L2 experience and L1 attunement (Flege, Munro, & MacKay, 1995). L2 perceivers tend to identify and discriminate non-native speech sounds with reference to the linguistic categories of their first language (Pisoni, 1982) and degree of cross-language phonetic (dis)similarity tends to predict perceptual ease or difficulty. This study set out to further investigate how the first language (L1) and language experience affect the perception of non-native English voiceless stops /p, t, k/. Specifically, the study aimed to examine whether Catalan and Portuguese learners of English could identify and discriminate between aspirated and unaspirated English voiceless stops, since in both Romance languages aspiration is a non-existent phonetic property (Ladefoged, 1971). Two groups of upper-intermediate learners of English (L1 Catalan (*n*=22) and L1 European Portuguese (*n*=19)) and a group of advanced Portuguese learners of English (*n*=22) performed two perception tasks (forced-choice identification and AX discrimination). The testing material consisted of word-initial voiceless aspirated stops (e.g., *pill, till, key*) and word-initial consonant clusters after /s/ (e.g., *spill, still, ski*) naturally produced by three British English talkers. The target (C)CVC words were embedded in the carrier sentence "This (target word)", so that the aspirated and unaspirated stop allophones would be similarly presented (e.g., *This pill - This spill*). Findings show that the more advanced learners obtained significantly higher scores than the less advanced learners, which seems to indicate an effect of language experience, in line with previous studies (Flege, Munro, & Skelton, 1992). Moreover, despite the comparable VOT patterns in their L1s and the similar amount of exposure to the target language, the Portuguese upper-intermediate group outperformed the upper-intermediate Catalan learners in both tasks, which may be a result of greater exposure to the target language. These findings seem to indicate that quantity and possibly quality of L2 input in different L1 linguistic environments influence non-native speech perception, and L2 language experience promotes accurate L2 allophonic speech perception.

Keywords: L2 speech perception, English voiceless stops, language experience

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Perceptual assimilation of English and Catalan vowels by English and Catalan listeners: A reciprocal study

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It is widely accepted that adult second language (L2) learners tend to identify target language sounds in terms of native categories, and thus fail to establish authentic or target-like categories for L2 sounds (e.g., Flege, 1987; Kuhl & Iverson, 1995). In order to establish target-like L2 categories, learners need to distinguish non-native sounds from the closest native categories (Flege, 1995). Flege proposes that the greater the perceived dissimilarity between native and non-native sounds, the more likely it is that learners may eventually categorize them authentically. Similarly, Best & Tyler (2007) make predictions about the likelihood of L2 category learning based on the strength and degree of the crosslinguistic assimilation. Importantly, these proposals crucially depend on a reliable measure of cross-linguistic similarity. Recent research advocates for the use of perceptual measures (e.g., Bohn, 2002; Strange, 2007). Previous cross-linguistic perception studies have often assessed the perceived similarity between native and non-native sounds by testing speakers of one of the two languages involved. This paper aims to explore the perceived similarity between native and non-native vowels by contrasting the perceptual judgments of speakers of the two languages involved.

A group of 28 native speakers of Southern British English and a group of 27 native Catalan speakers performed a perceptual assimilation task, in which listeners identified native and non-native stimuli in terms of native categories and provided goodness of fit ratings. Test stimuli included English and Catalan vowels and diphthongs elicited in /bVt/ frames. On the whole, the comparison between the two groups indicated a symmetry in the pattern of crosslinguistic perceived similarity. In fact, some native-nonnative mappings reached very high rates of interlingual identification (e.g., English /æ/-Catalan /a/, English /ɛ/-Catalan /ɛ/, English /aɪ/-Catalan /ai/), indicating cases of possible near-identity or perceptual overlap. Most English vowels were assimilated to a single Catalan vowel, with varying degrees of goodness of fit (e.g., both English /æ/ and /ʌ/ to Catalan /a/, but with different goodness ratings). English listeners revealed less consistent patterns (e.g., Catalan /i/ was assimilated to both English /i/ and English /ɪ/, while English /i/ only to Catalan /i/), which could be related to an effect of inventory size, English having a larger vowel inventory. It is argued that a reciprocal measure provides a more complete assessment of cross-language similarity, as well as providing a means of differentiating among different levels of similarity, e.g., by revealing cases of near-identity. These results are discussed in light of current theories and their predictions for second language perception and production.

Keywords: L2 speech perception, cross-linguistic similarity, vowels

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Voice onset time and cross language influence on the speech of bilingual Greek-English children

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A key question in the study of bilingualism is how bilinguals manage to accommodate to the needs of each linguistic system they are exposed to. There are conflicting results in the literature on whether bilinguals develop two distinct linguistic systems or a unitary one. A powerful diagnostic tool to test the above hypotheses is Voice onset time (VOT) which measures the temporal interval between the release of a stop and the onset of voicing for the following vowel. Its power stems from its language specificity. For instance, English or German distinguish between voiced and voiceless stops by producing the first with short-lag voicing and the second with long-lag voicing. Greek or Spanish, on the other hand, produce voiced stops with voicing-lead and voiceless stops with short-lag voicing. VOT data from bilinguals exposed to languages with different voicing distinctions can offer an insight to the way bilinguals establish their phonetic categories. Intermediate VOT values reveal the presence of an integrated system. Monolingual-like VOT values suggest the existence of independent phonetic systems unaffected by each other while distinct but significantly different VOT values to those of monolinguals can be interpreted as evidence of two separate systems vulnerable to cross-linguistic interference.

In our study, we investigate voiced and voiceless stops in word initial position (/p,t,k,b,d,g/) produced by Greek-English bilingual children, aged 8-12. Research on this language pair is limited (see Beach et al., 2001 and Antoniou et al., 2010) and the age group of bilinguals for this language pair has not been investigated before. Phonetic analysis of stops produced by monolingual Greek and monolingual English children of the same age range was also performed for comparison purposes. Our bilingual group consisted of children raised both in Greece and England. Our study investigates the significance of the community language factor since previous studies report evidence of influence on VOT values by the language context bilinguals live in (see Sancier & Fowler, 1997; Antoniou et al., 2010). The results are discussed in relation to previous literature on bilingual studies examining not only Greek-English bilinguals but also bilinguals of other language pairs following similar patterns of voicing contrasts.

Keywords: bilingualism, Greek, English, Voice Onset Time (VOT), language context

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Predicting L2 vowel identification accuracy from cross-language mappings between English and Korean

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Park and de Jong (2008) developed a quantitative model to predict how native Korean listeners' L1 consonant categories affect their perception of L2 English consonants. The model was shown to successfully predict the Korean listeners' identification of English consonants, especially the identification of Korean similar stops when the listeners' goodness-of-fit of L1 labeling to L2 categories was incorporated into the model. Unlike consonants, however, vowels may not be perceived categorically and thus the perception of vowels may be different from that of consonants (Strange et al., 1998). Consequently, the paper investigates to what extent the quantitative model can predict native Korean listeners' L2 English vowel identification based on the listeners' L1 vowel categories adopting the formula developed by Park and de Jong. The paper also examines whether the model can make better predictions about Korean similar vowels than new vowels when the goodness ratings are used. Twenty-one Korean listeners participated in the cross-language mapping and English vowel identification tasks. The stimuli produced by 2 American English speakers consisted of 11 American English vowels /i, ɪ, eɪ, ɛ, ɑ, æ, ɔ, oʊ, ʊ, u, ʌ/ in the *p/b_t* context (e.g., *beat, pot*). There were 88 stimulus items. The Korean listeners were instructed to identify English vowels with IPA symbols and also to map English vowels onto Korean orthography. They further rated the goodness-of-fit of the Korean labels to the English vowels. The results of identification and mapping tasks indicate that the quantitative model predicted identification of English vowels /ɛ/ and /u/ accurately based on L1 categories. When the listeners' goodness ratings were incorporated, the model tended to make a better prediction for English vowels such as /i/, /ɑ/, /u/, and /ʌ/, which are considered to be similar to the matching Korean vowels. However, the model did not make good predictions about new vowel categories like /ɪ/, /ʊ/, and /eɪ/ as the Korean listeners performed much better than the model predicted, which indicates that the listeners could be in the process of forming new L2 vowel categories for the vowels. Overall, identification accuracy was higher than predicted but the predicted error patterns tended to fit the error patterns observed. Importantly, the current study reveals that the Korean listeners used L1 vowel categories in identifying English vowels at least to some degree, thus corroborating the findings of Park and de Jong (2008) for English consonants. Also, the results are of significance because the postulations of the Speech Learning Model (Flege, 1995) that L2 listeners use L1 vowel categories to perceive L2 vowels and that L2 listeners are able to establish new L2 phonetic categories were substantiated by the quantitative model to some extent. (1) Park & de Jong (2008: 709, 710): a. Prediction of accuracy based on the confusion between L1 and L2: Probability of accuracy where Category A is perceived as Category A = Σ (probability of category A being perceived as L1 category X × probability of L1 category X being associated with category A). b. Prediction of specific errors based on the confusion between L1 and L2: Probability of error where Category A is perceived as Category B = Σ (probability of category A being perceived as L1 category X × probability of L1 category X being associated with category B). c. Weighted proportion of L2 category X in L1 category Y: Proportion of L2 category X in L1 category Y = {probability of L2 category X is perceived as L1 category Y × (its mean similarity rating score–3.5) / Σ (probability of all L2 categories associated with L1 category Y × (its mean similarity rating score–3.5)}.

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The role of music in second language acquisition

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In the past few decades, a number of research studies on different aspects of musical processing and its neural correlates have been conducted. Clynes (1982, 1983), for example, dealt with the matter of lateralization, while Patel (2008) challenged the belief that music and language are processed independently and provided the first synthesis between the processes of both and their specific features, arguing that music and language share deep and critical connections. Koelsch & Siebel (2005) explore the relationship of language and music in the brain. A more recent study by Saglam, et al. (2010) examines music and its benefits on second language acquisition.

The aim of this paper, which is based on my bachelor's thesis, is to examine whether and to what extent L2 learning can benefit from the use of music as an instrument of teaching. The first part of the paper contains a comparison of language and music, discussing which areas of the human brain are activated during processing and whether there is an overlap in the neural areas responsible for language features (grammar, syntax, semantics) and musical grammar. In the second part of the paper, a pilot study including a questionnaire is presented along with its results. An eleven year-old Greek student, trilingual in German, Greek and English, volunteered as the subject of the pilot study. She was first taught new vocabulary, elementary grammar and syntax and in the ensuing session was instructed to listen to a song and then to read and sing it in her own rhythm. The student knew the Greek alphabet but in order to facilitate the reading progress, 'Greeklish' (the Greek language written in Latin characters) was used to transcribe the sentences. As a consequence of the pilot study, aspects such as the student's pronunciation, her reading skills including fluency, rhythm and intonation, as well as translation skills visibly improved through the use of songs, as did her mnemonics. The student's vocabulary, grammar and syntactic ability also saw improvement, but not to the same degree as her intonation or rhythm. While this clearly indicates the additional need for primary learning materials, this paper shows that employing music in teaching can have positive effects in second language acquisition and enhances students' motivation in the process.

Keywords: music, brain, second language acquisition, foreign language teaching, trilingual

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The phonological development of Danish-speaking 2-year olds: Evidence from cross-sectional and longitudinal data

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Recent theories about speech acquisition postulate that not only child intrinsic factors like biological and cognitive abilities play an important role for the phonological development but also the input from the environment, i.e. frequencies pattern of the ambient language (Davis & Bedore, 2013). Studies on the phonological development of typically developing children across languages show language specific patterns that can be ascribed to differences in the phonological system of the ambient languages. Since the phonology of Danish is characterized by a sound structure with many vowels, consonant weakening and schwa-reduction which makes it difficult to perceive syllable boundaries and numbers of syllables within and across words (Bleses, Basbøll, Lum, & Vach, 2011), it has been suggested that Danish-speaking children should be slower in their phonological development than children acquiring other languages with a clearer speech sound input. So far only little is known about the phonological development of children learning Danish as their first language.

Therefore, the aim of the present study is twofold. First for theoretical purpose, the rate and order of phonological acquisition in two-year old Danish-speaking children will be examined. Second, the path of acquisition, i.e. development of consistency and the types of phonological processes will be investigated in order to provide normative data for the clinical assessment of children with suspected speech disorders. Therefore, a longitudinal and a cross-sectional study were carried out.

For the cross-sectional study 75 children aged 2;6-2;11 years were recruited from all regions of Denmark. The children were assessed with a picture-naming test. Data analysis investigated the developmental phonological processes, a process being defined as occurring at least three times per child in at least 10% of the children within an age group. The results reveal that Danish children already at the end of their second year of life show a nearly completed phonological inventory. This indicates that fundamental steps of the phonological development must take place at a younger age. Therefore, a longitudinal study was carried out to investigate children's phonological skills from 2;0-2;6 years. Five children from Funen were tested with the same picture-naming test as well as an inconsistency test three times over a period of six months. Identified phonological processes, phone acquisition as well as inconsistency results will be investigated. The data analysis so far indicates that Danish cannot be considered as a more difficult phonological system to learn in spite of the unclear speech input.

Keywords: phonology, acquisition, two-year-olds, Danish

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Access to context and the perception-production of English sentence prosody

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Recent findings suggest that access to different levels of contextual information affects L2 perception and production of intonation (Ortega Llebaria & Colantoni, 2014). Here, we seek to determine how increasing contextual information affects the perception and production of English sentence-types (statements, absolute yes-no questions –AQs– and declarative questions –DQs–) by speakers of Mandarin, a tonal language. Mandarin differs from English in that the two questions are syntactically identical; questions differ from statements by either the presence of a lexical marker (*ma*) sentence finally with a rising boundary tone, or the structure Verb-not-Verb (e.g., Liu & Xu 2005; see Yuan, 2006 for discussion about global cues). Thus, compared to controls, learners are expected to (i) diverge more in the perception of DQs and AQs than in statements; (ii) produce a larger pitch range in the nuclear rise of both question types; (iii) display larger contextual effects.

We compared Canadian English controls (N=10) to L1 Mandarin advanced learners of English (N=15; AoA=18.1; LoR=2.1) across perception and production experiments where access to contextual information was manipulated. Perception tasks included a low-pass filter task, a decontextualized sentence identification task, and a matching task (a context with three possible answers). Production experiments involved a de-contextualized sentence repetition task and a context completion task. Mean accuracy rates per language group and RTs were analysed for the perception data. For production, the first pitch accent (PA) and the nuclear contour (final PA plus boundary tone) were acoustically analysed (F0 changes). Results revealed larger differences in production than in perception. Specifically, the production tasks yielded different patterns of cross-linguistic influence (CLI). In the sentence-repetition task, phonetic differences were restricted to the PA realization; although Mandarin learners resembled controls, they used PAs more frequently, consistent with previous findings (Tevis McGory, 1997). In the contextualized production task, Mandarin speakers showed a significantly larger pitch excursion than control speakers in the realization of the nuclear contours both in AQs ($F_{(1,12)}$=22.6; p=.0001) and DQs ($F_{(1,12)}$=26.7; p=.000). In perception (against our predictions), groups did not significantly differ across tasks in the mean accuracy rate, but Mandarin speakers showed a significantly longer RT in the de-contextualized perception task ($F_{(1,20)}$=7.9; p=.005). In line with previous studies (Mennen, 2004), results revealed CLI in the realization of phonetic parameters (size of the F0 excursion in NCs) in both types of questions, which was enhanced in contextualized tasks. Thus, increasing contextual information affects perception and production differently. While no significant effects were observed in perception, the contextualized task led to greater differences in the realization of boundary tones, whereas the repetition task led to greater differences in the realization of PAs. Results suggest that, similar to segments, the acquisition of intonation is modelled by typological differences, contextual effects, and the specific target structure to be acquired.

Keywords: intonation, L2-acquisition, sentence type

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Statistical probabilities aid in the development of L2 phonological representations

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To date, the results of the phonological training studies aimed at improving lexical access in L2 have been mixed. Some have shown that it is, in fact, possible to develop sensitivity to a non-native contrast to aid word recognition (e.g., Perfors & Dunbar, 2010), while others have failed to demonstrate this result (e.g., Dufour, Nguyen, & Frauenfelder, 2010). One potential explanation for the lack of success is the possibility that sensitivity to a phonological contrast could be a consequence of generalization based on the available lexical items that contain the contrast (top-down route) rather than a result of direct phonological influence on the minimal pair discrimination (bottom-up route), which is in line with child language acquisition theories (Charles-Luce & Luce, 1990; Walley, 1993).

The current study aims at identifying which route (top-down or bottom-up) contributes most significantly to the development of adequate phonological representations in a second language (L2). Bottom-up processing relies on perceptual phonetic properties alone, while top-down processing relies on lexical properties, such as word onset probabilities in the encountered input. The AX discrimination task manipulated both parameters: perceptual complexity and the statistical probabilities of the initial CV sequence. Four groups (advanced L2 learners of Russian (n=20), superior L2 learners of Russian (n=30), native Russian controls (n=31), and naïve listeners without prior Russian experience (n=20)) completed an auditory discrimination task (AX), consisting of nonce words with palatalized/non-palatalized consonants in the onset, which is a particularly challenging distinction for American learners of Russian.

The study demonstrates that (1) native speakers and superior L2 learners, but not advanced L2 learners or naïve listeners experience a processing advantage of CV clusters of higher statistical probability; (2) with higher proficiency, L2 learners develop a greater discrimination ability for palatalized consonants and a processing benefit of CV clusters of higher statistical probability; (3) some perceptually difficult CV clusters remain insensitive to input frequencies even for superior L2 speakers. More generally, the results are in favor of the top-down development of the phonological categories in L2.

Keywords: phonological perception; statistical probabilities; nonnative phonological contrasts

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Comparison between French monolingual and French-Portuguese simultaneous bilingual children: Vocabulary size, grammatical distribution and phonetic complexity

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This study is part of the CDI study carried out by WG3 members within COST Action IS0804 and compares lexical development in a sample of 29 simultaneous French-Portuguese bilingual children between 24 and 36 months of age and living in France. We used the French (IFDC) and the Portuguese (IPDC) adaptations of the MacArthur-Bates Communicative Development Inventory (MCDI). For each child, one IFDC questionnaire, one IPDC questionnaire and an adaptation of the Questionnaire for Parents of Bilingual Children (PaBiQ) (COST IS0804, 2011) were collected. We only selected typically developing children who have at least one parent speaking European Portuguese on a regular basis and who were born in France.

Our first hypothesis was that a bilingual environment does not hinder lexical development between the ages of 24 and 36 months. Our data show that our subjects do not exhibit any lexical developmental delay compared to their monolingual French peers. This result was also found when comparing the subgroup of our 18 children aged between 24 and 30 ($W=2362$, $p=0.81$).

Our second hypothesis was that grammatical distribution of words was the same between monolinguals and bilinguals. The results confirmed our hypothesis with no statistically significant difference between monolinguals and bilinguals. However, grammatical distribution in the bilingual group between their French and Portuguese vocabulary was statistically significant ($X^2=58.06$, $p < 0.05$). We hypothesize that it could be due to the fact that they are not balanced bilinguals.

Our third hypothesis was that small vocabulary size would be composed of simple phonetic words and complex phonetic words will appear gradually as vocabulary size increases. The Index of Phonetic Complexity (Jakielski, 2000) has been used to evaluate word phonetic complexity. The results showed that there is a strong correlation between phonetic complexity and vocabulary size in both languages (French: $r_s=0.85$, $p<0.05$; Portuguese: $r_s=0.84$, $p<0.05$), even if IFDC and IPDC by themselves are weakly correlated ($r_s=0.28$, $p<0.05$). This strong correlation mirrors the one found for monolingual peers ($r_s=0.87$, $p<0.05$). Moreover for monolinguals and bilinguals for both their languages the correlation was stronger for nouns than for predicates (For nouns: monolinguals: $r_s=0.88$, $p<0.05$; French: $r_s=0.91$, $p<0.05$; Portuguese: $r_s=0.88$, $p<0.05$. For predicates: monolinguals: $r_s=0.42$, $p<0.05$; French: $r_s=0.56$, $p<0.05$; Portuguese: $r_s=0.48$, $p<0.05$).

To summarize, the French lexicon of our bilingual children presents the same characteristics as the lexicon of French monolingual children. This is probably due to their sociolinguistic situation in which they clearly hear more French than Portuguese. Moreover, the French and Portuguese lexicon of our bilingual children are similar regarding phonetic complexity, and mirror the lexicon of French monolingual children in that respect.

Keywords: bilingualism, lexical development, grammatical category, phonetic complexity, French, Portuguese, MacArthur-Bates communicative development inventory

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Characterizing rhythmic alterations in the speech of French dysarthric patients

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Motor speech disorders (MSD) are characterized by alterations affecting the flow of the speech stream. Perceptual differences between abnormal rhythmic patterns can be used to distinguish dysarthria types (Darley et al., 1969). Dysarthric speech associated with Parkinson's disease (PD) is produced with poor breath support leading to reduced utterance length, local rushes of speech, and sometimes accelerated speech rate; in ataxic dysarthria (AT), the irregular breakdown of articulatory movements contributes to a decreased speech rate and the impression of scanned speech; in the Amyotrophic Lateral Sclerosis (ALS), speech can be extremely slow and prolonged, with equal rhythm. Mostly concerned with Germanic languages, the literature on rhythmic disturbance in MSD also frequently mentions the loss of distinction between stressed and unstressed syllables, a strong characteristic of stress-timed languages.

The biggest challenge in the study of rhythm, be it for its comparison between languages, learners, or patients, is to find the way to characterize and quantify with precision its specific aspects. Various rhythmic metrics derived from cross-linguistic comparisons have recently been applied to discriminate types of dysarthria in English, with success (Liss, 2009, 2013), or not (Lowit, 2014). We examine here rhythmic alteration in a syllable-timed language lacking lexical stress: French. 28 dysarthric patients (12 ALS, 8 PD, 8 AT) and 11 healthy control speakers (Ctrl) have been recorded reading a paragraph of 71 words. After a manual segmentation in phonemes, rhythmic metrics were computed within each inter-pausal units (IPU) on 3 types of intervals: consonant- and vowel- *segments*, inter-vowel- and vowel-*sequences*, CV *syllables*. Articulation rate, IPU duration, mean duration of intervals, variability of duration (Δ and Varco), pair-wise variability index between successive intervals (nPVI, rPVI) were computed either manually or with Correlatore (P. Mairano, http://lfsag.unito.it/correlatore).

In order to test which of these 21 metrics best discriminate the productions according to their respective population membership, a linear discriminant analysis was performed in R. 9 metrics were identified as being the most important for maximizing distances among group distributions: Articulation rate (stronger contribution), V & C & UIP duration, variability of C & V & Syll duration (VarcoV-int, ΔV-int, ΔVseg, ΔCseg, Δsyll). Together, these metrics predicted group membership with an overall accuracy of 62% (cross validated). Productions of the control group were the most accurately classified (78%), while the PD group was the least discriminable (61% of their productions misclassified as belonging to the Ctrl or AT group). The productions of AT and ALS speakers were slightly better discriminated (34% and 39% misclassified cases respectively, which are often confounded with one another). These classification results will be further discussed at the conference in relation to the population-specific particularities found on the quantified dimensions and in comparison between results found in stress-timed languages.

Keywords: rhythm metrics, dysarthria, French, linear discriminant analysis

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The role of IQ and personality traits in the development of L2 oral fluency

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Personality plays a major role in influencing human behaviour (Eysenck, 1994). Similarly, intelligence influences everyday competence (e.g., accomplishing daily tasks such as banking (Gottfredson, 1997)), academic and job performance (e.g., Schmidt & Hunter, 1998), and various important social characteristics (e.g., socioeconomic status; Jensen, 1998). It is thus surprising that research investigating the effect of intelligence and personality on second language (L2) acquisition has been limited compared to other individual differences (e.g., motivation). We fill this gap by investigating the role of the Big Five personality traits (extraversion, conscientiousness, agreeableness, openness to experience, and neuroticism; e.g., McCrae & Costa, 2003) and intelligence in 100 advanced Anglophone learners' L2 acquisition of spoken French fluency. The high degree of inter-learner variability observed in mastering L2 fluency is due to the complexity of this phenomenon, which is conditioned by several variables that correlate with both intelligence (e.g., working memory capacity) and personality (e.g., input received and output produced; short-term memory capacity and language anxiety). We discuss a study that has been designed to address five lacunae in previous research. We use six temporal/hesitation measures of fluency (i. speech rate; speech runs that are ii. hesitation-free, iii. filler-free, iv. fluent, v. repetition-free, and vi. grammatical-repair-free; Freed, Segalowitz & Dewey, 2004). Two elicited production tasks (repetition and picture narration), which differ in terms of syntactic and lexical complexity, serve to obtain speech samples in both L1 and L2. It is integral that fluency be measured in L1 and L2 since some researchers suggest that fluency is stable across languages (Raupach, 1980), learners who are more fluent in L1 are more fluent in L2. Personality is measured using the Big Five Aspect Scale Test (DeYoung, Quilty, & Peterson, 2007) and the Wechsler Adult Intelligence Scale-Revised measures intelligence.

Keywords: fluency, personality, L2 speech acquisition, bilingual speech, speech production

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Dysarthric speech: Acoustic-phonetic features and intelligibility

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An important part of the therapy for dysarthria patients is aimed at increasing their reduced speech intelligibility. This requires intensive training which cannot always be provided by speech therapists. For these reasons attempts have been made at developing systems that allow dysarthria patients to practice on their own with limited help from therapists. This form of independent therapy appeared to have several advantages and was effective in improving speech intensity (Beijer, 2012). In this therapy articulation problems were not specifically addressed, although it is known that these also impact speech intelligibility (De Bodt, Hernandez-Diaz Huici, & Van De Heyning, 2002).

The main problem in this respect is how to detect articulation problems automatically. A possible solution might be to employ speech technology, based on Automatic Speech Recognition (ASR), as is done to identify pronunciation errors in second language learning. Research in this domain has revealed that it is possible to employ dedicated speech technology to identify errors in the realization of speech sounds in the L2 (Strik et al., 2009) and to provide corrective feedback that can help learners improve their pronunciation (Cucchiarini et al., 2009). In the case of language learning, the results showed that the reduction in the number of pronunciation errors of a group that received feedback on automatically detected pronunciation errors was significantly larger than that of a control group.

To investigate to what extent such an approach can be applied to dysarthric speech, speech recordings of dysarthric patients were automatically analysed by means of speech technology tools to automatically calculate various acoustic-phonetic features that are often employed to score L2 speech, and which are possibly related to speech intelligibility. Experiments were carried out to obtain human ratings of speech quality and intelligibility. The acoustic-phonetic features were then compared to speech quality judgments assigned by human raters. The first results show interesting patterns, indicating that the reduced intelligibility of dysarthric speakers might be partly due to a reduced vowel space (a less clear articulation of the vowels) and a smaller variation in the fundamental frequency (more monotonous speech). These results indicate how the intelligibility of dysarthric speakers could be increased by providing specifically focused speech training through automatic techniques.

Keywords: speech intelligibility, articulation, dysarthria, speech technology

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Native language effects on pronunciation accuracy in L2 English

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We investigated longitudinal aspects of word pronunciation acquisition for learners of English as a second language (L2). By using automatic speech recognition (ASR), we obtained an accuracy measure of how closely the learners' pronunciation resembles that of first language (L1) speakers, and used this measure to look for differences between four L1's: Russian, German, Italian and French.

Speech was sampled from the spoken/speech part of the EF-Cambridge Open Language Database (Post et al., 2012), which is developed by the international educational organization EF Education First and the University of Cambridge. These speech data are being collected from learners enrolled on ``Englishtown'', EF's e-learning platform, which provides 16 CEFR-aligned skill/proficiency levels.

The spoken part of EFCAMDAT contains scripted speech in reading-aloud exercises, and elicited speech in listen-and-repeat exercises in which the student is asked to repeat a word or phrase and attempt to mimic its pronunciation and intonation. Speech data of these two types of exercises were collected during a three-month period for the L1s of interest. All production of each learner who enrolled on Englishtown during this period was recorded, resulting in a dataset containing word samples of single word and small sentence recordings at each of the 16 levels from Russians (N=291), Italians (N=197), Germans (N=170), and French (N=156) learners, totaling 509,001 word samples involving 5,386 unique words.

An ASR system (Dragon ASR) was trained on native speech for each exercise separately, assuring low word error rates. The word recognition confidence scores, estimated by the ASR by comparing the learner's speech to the trained native speech, provided our pronunciation accuracy measure. When averaging word scores first by learner, and then by level, we find that pronunciation accuracy shows a steady upward trajectory as learners get more exposed to pronunciation exercises.

Word scores averaged by learner and then by L1, show that whereas French, Russian, and Italians increase their pronunciation accuracy considerably across increasing levels, this is distinctly less so for Germans. The most likely explanation lies in the phonological similarity between English and German as opposed to English and the other two L1s.

We will further provide an analysis on individual words that show most divergence amongst L1s and review their phonetic properties, and future work will involve the use of phoneme lattices from ASR output to analyse phonetic L1 effects. Most importantly, we believe this approach will be particularly useful to explore large learner data.

Keywords: pronunciation, automated speech recognition, second language acquisition

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Can orthographic cues affect speech perception? Evidence from Greek speakers of English shows that both orthographic and phonetic cues are weighted in speech sound perception by second language speakers.

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Purpose: Reading in a second language can involve the additional processing of speech-sound contrasts that have multiple phonetic cues and can be particularly difficult for foreign-language learners especially if the cues are weighted differently in the foreign and native languages (e.g., Giannakopoulou et al., 2013). The orthographic representation of words is suggested to also interfere with speech sound perception in way of presenting additional cues for the second language learner. In order to examine the possibility that orthographic representation of the word stimuli provides additional cues, this study explores perceptual identification with the use of pictures as visual stimuli.

Method: Greek child and adult speakers of English were studied to determine on what basis they are making perceptual identification between English vowels. One task involved the use of minimal pairs in their orthographic form (word stimuli), another task used relevant pictures that resembled the meaning of the respective words. The auditory stimuli used in both task types were identical.

Results: Performance was impaired for Greek speakers across all tasks but worst for Greek speakers for the picture stimuli task. Interestingly, child Greek speakers performed significantly worse in the picture stimuli task, even though a picture translation control task revealed high performance.

Conclusions: Findings suggest that there may be a 'link' between orthography and perceptual identification serving as an additional cue for L2 speakers. These results are discussed in terms of the relationship between orthographic and auditory weighting of cues that inform the strategies used to acquire new languages.

Keywords: perceptual processes, phonological processing, orthographic cues, phonological cues

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Instructed English *schwa*: Explicit vs implicit attention in a CLIL setting

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Much research in Second Language Acquisition concurs in acknowledging some attention to form as necessary in the language acquisition process (Radwan, 2005). A case in favour of instruction is also often made by many SLA researchers (Doughty, 2005). However, research still has to unravel whether different attention-drawing instruction types, namely explicit and implicit, affect the language learning process differently. Furthermore, there is little empirical evidence on the pedagogical impact of different instruction approaches on second language (L2) phonology learning (Benson & García Mayo, 2008). Recently developed teaching-learning settings such as CLIL (*Content and Language Integrated Learning*) may become a suitable environment so as to explore how learners may take advantage of different instruction processes as these are learning contexts in which both instruction and input can be maximised.

The present study aims at determining whether CLIL students' awareness of the nature and occurrence of English *schwa* in unstressed syllables of content words (*bacon*) may benefit from explicit phonetic training and from implicit exposure to native input. Four intact CLIL groups of 25 students each were selected. For one month, Groups 1 and 2 underwent explicit phonetic training based on discrimination and identification tasks (Group 1) and listen-and-imitate tasks (Group 2) on English *schwa* in content words while Group 3 attended Science lessons delivered by a native speaker. Group 4 (control) did not receive explicit phonetic training and was not exposed to native English input. All groups were administered an awareness perceptual task immediately before and after the treatment period in which students had to judge English words containing 'incorrect' full vowels and 'correct' *schwas* as correctly or incorrectly pronounced on the basis of the quality of the vowel in the unstressed syllable.

All four groups tended to judge both *schwas* and full vowels as correct in the pre-test, indicating that they were not knowledgeable of the general pattern of occurrence of vowels in unstressed syllables in English. In the post-test, the three experimental groups (Groups 1, 2 and 3) significantly improved their ability to identify full vowels as incorrect while Group 4 (control)'s judgements did not exhibit intra-group differences from the pre- to the post-test phase. Analysis of Variance did not show differences among the three experimental groups. However, it was observed that Group 1 exhibited higher gain scores than Group 2, which in turn, exhibited higher gains than Group 3. Results seem to support the expediting effect of both explicit phonetic instruction and implicit exposure to native input and that this boosting effect could be more substantial when explicit phonetic instruction is delivered than when exposure to native input is accessed in a CLIL setting.

Keywords: perceptual awareness, *schwa*, CLIL, explicit/ implicit instruction, native input

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Late second language learners, but not early starters rely on fuzzy phonological representations of words in speech processing: Facilitation instead of inhibition in phonological priming

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While the difficulty in the acquisition of non-native phonological contrasts has been widely attested for nonnative speech perception, the present study is the first to explore nonnative phonological speech processing that does not hinge on a difficult nonnative phonological contrast. Rather, it investigates the robustness of phonological encoding in nonnative words through the effects of competition of phonological neighbors with initial overlap. In native phonological priming, when the prime and the target share onsets, a three-phoneme initial overlap leads to inhibition effects that are due to competition for selection between the target and its phonological competitors.

The present study includes two phonological priming experiments and uses pairs of high- and low-frequency semantically and morphologically unrelated Russian words with a three-phoneme initial phonological overlap and an inter-stimulus interval of 320 ms (e.g., /vrak/ '*enemy*' - /vra͡tʃ/ '*doctor*'. Experiment 1 compares three groups of English-speaking late learners of Russian with different proficiency (21 advanced, 18 advanced high, and 18 superior) in order to identify a nonnative developmental trajectory, and 10 native speakers of Russian as a control group. Experiment 2 explores the role of early/late start with 36 English-speaking late learners of Russian, and 24 heritage speakers, who initially acquired Russian as a native language, and later switched to English, their dominant language ('early starters'). Crucially, early starters and late learners are matched in Russian proficiency, so that the observed differences are indeed due to the early/late start.

Experiment 1 showed predicted inhibition in native Russian speakers, and inhibition for high-frequency words only in the highest-proficiency nonnative group. However, nonnative facilitation was observed for low-frequency items, and it increased at higher proficiency levels.

Experiment 2 confirmed the pattern of facilitation and inhibition for late learners. Conversely, early starters with nonnative proficiency showed the same pattern of inhibition as native speakers.

Together, the experiments indicate that second language learners rely on nonnative mechanisms in phonological processing of speech even in the absence of difficult phonological contrasts. Instead of inhibition that is observed in native speakers and triggered by lexical competition, they show prelexical phonological facilitation for less frequent words, indicating that phonological representations of lower-frequency nonnative words are fuzzy and unfaithful. Importantly, facilitation increases at higher proficiency levels and therefore, cannot be interpreted as a result of unfamiliarity with the experimental items. Early starters, or heritage speakers, matched in proficiency with late learners, show predicted inhibition also observed in native speakers; accordingly, they rely on robust native-like phonological representations in lexical access, and more broadly, in speech processing.

Keywords: speech processing, phonological representations, priming, nonnative, second language learners, heritage speakers

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Mechanisms of language control and cognitive control in bilingual aphasia

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This study aims to examine language control (LC) and cognitive control (CC) in bilingual adults with aphasia (BAA) and determine whether LC deficits are specific to the language domain, indicative of domain specific cognitive control (DSCC) or indicative of domain general cognitive control (DGCC). Few studies have investigated LC and CC mechanisms in BAA and have found conflicting results (Gray & Kiran, in press; Dash & Kar, 2014; Green et al., 2010).

Participants included twelve Spanish-English BAA (mean age=51, *SD*=13) and nineteen Spanish-English neurologically healthy, bilingual adults (NHBA) (mean age=48, *SD*=14) matched on age and education. Participants were Spanish or English dominant and simultaneous or sequential language learners with first language being Spanish or English.

All participants completed a language history questionnaire and four computer based tasks that were matched on complexity. Tasks were designed to evaluate a specific kind of cognitive control, resistance to distractor interference and contained congruent and incongruent conditions: *non-linguistic flanker* (NLT-flanker), *linguistic flanker* (LT-flanker), *non-linguistic triad* (NLT-triad), and *linguistic triad* (LT-triad). We examined congruency effects (CEs) (i.e., longer response times for incongruent conditions relative to congruent conditions) for all tasks. We hypothesized CEs on linguistic tasks but not on the non-linguistic tasks (or vice versa) would be indicative of DSCC, whereas CEs on all tasks *or* only on the two less complex tasks would suggest DGCC.

For each task, two three-way ANOVAs were performed, evaluating the effect of condition (congruent/incongruent) x target (Spanish/English) x group (NHBA/BAA) for percent accuracy and RT. Results are significant at $p < .05$.

Between-subjects results revealed that NHBA are significantly more accurate (NLT-flanker: F=8.35 NLT-triad: F=33.10; LT-triad: F=8.06) and faster (NLT-flanker: F=19.02; LT-flanker: F=15.36; NLT-triad: F=8.50; F=31.15) than BAA. Within-subjects results revealed that both groups were faster on congruent conditions relative to incongruent conditions for both accuracy (NLT-flanker: F=4.8, NLT-triad: F=42.55) and RT (NLT-flanker: F=16.35; LT-flanker: F=13.17; NLT-triad: F=69.56). On the LT-triad, a significant interaction between condition and target for RT (F=11.26) was observed. Post hocs indicated that participants were faster on English congruent conditions relative to English incongruent conditions.

To evaluate the difference in the magnitude of conflict effect between groups, we visually inspected conflict ratios (CRs) (congruent-incongruent/incongruent) on each task for accuracy. Results revealed that BAA exhibited larger CRs on the NLT-flanker and NLT-triad compared to NHBA.

Results are suggestive of DGCC because both groups demonstrate CEs on all tasks. The CR analysis suggests that BAA experience more interference when processing distracting information on non-linguistic tasks compared to linguistic tasks, a surprising but interesting finding.

Keywords: aphasia, cognitive control, language control

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The development and standardisation of the bilingual Maltese-English speech assessment (MESA)

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Speech language pathologists working with Maltese-English bilingual children often assess and diagnose speech disorders using assessment protocols standardised on monolingual, English-speaking populations. Such tests are considered inappropriate for the Maltese bilingual children since they are not linguistically or culturally oriented. An innovative speech assessment protocol which is bilingual in nature, was developed and standardised. Children were tested in Maltese and/or English depending on their language (or language mix) exposure. A novel feature of this assessment battery was that for all of the items, children were able to respond in either language, reflecting the reality of language mixing in a bilingual population. Trends of speech development for monolingual and bilingual children aged between 2;0-6;0 years are reported, differentiating between the emergence of the ability to produce speech sounds (articulation) and typical developmental error patterns (phonology). This assessment gives clinicians a more objective view of the discrepancy between typical development, delay and deviancy for children acquiring speech in Malta. The research findings are novel and have both theoretical and clinical implications.

Keywords: speech assessment, bilingual speech assessment, bilingual Maltese-English speech test

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Gradience in multilingualism and the study of comparative bilingualism: A view from Cyprus

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A multitude of factors characterizes multilingual compared to monolingual language acquisition. Two of the most prominent viewpoints have recently been put in perspective and enriched by a third (Tsimpli, 2014): age of onset of children's exposure to their native languages, the role of the input they receive, and the timing in monolingual first language development of the phenomena examined in bi- and multilingual children's performance. We suggest a fourth: language proximity, that is, the closeness or distance between the two or more grammars a multilingual child acquires.

The empirical part of this study comes from two types of data involving Greek and collected in Cyprus (and Greece): the acquisition and development of object clitics in two closely related varieties of Greek by bilectal, bilingual, and multilingual children and performance on executive control in monolingual, bilectal, and bi- or multilingual children. A third line of inquiry will be touched upon, namely the role of comparative bilingualism for children with developmental language impairment.

The populations tested come from several groups of children: monolingual speakers of Standard Modern Greek from Greece, multilingual children from Cyprus who speak the local variety (Cypriot Greek), the official language (Standard Modern Greek), and Russian or English (and some children even an additional language), and what we call bilectal children, native acquirers of Cypriot Greek in the diglossic environment of Cyprus who also speak the official language but have not been exposed to any other languages; in addition, there are Hellenic Greek (two parents from Greece) and binational children (one parent Hellenic Greek, the other Greek Cypriot), residing in Cyprus.

On the basis of the measures mentioned, we want to establish a gradience of bilingualism which takes into account two very closely related varieties, in this case Cypriot Greek and the standard language. The experimental findings suggest that bilectal children do indeed pattern somewhere in between monolingual and multilingual children in terms of vocabulary and executive control, yet at the same time none of the three groups exhibit significant differences in their pragmatic abilities; the often raised "cognitive advantage" of bilingualism must thus be further distinguished and refined (cf. Bialytok et al., 2009, and a host of recent literature). The analysis of object clitic placement is more complex, however, crucially involving sociolinguistic aspects of language development such as schooling, place of residence, and gender.

Keywords: acquisition, clitic placement, Cypriot Greek, executive control, Greek varieties

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Age of learning may not matter in foreign language learning: The perception of phonemic contrast between English /r/ and /l/

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Some studies (e.g., Larson-Hall, 2008; Lin et al., 2004) found that despite a few hours' classroom contact per week, early language learning might benefit second language (L2) speech perception in both normal and adverse conditions, including talker differences. This study investigated effects of a younger starting age in a situation of minimal exposure on the perception of English consonants produced by different talkers with different noise levels. Native speakers of English (n=10) and two groups of Japanese university students participated in a phonemic discrimination test: one group (n=25) started studying English for a few hours a week between the ages of three and eight (early learners), and the other (n=25) began to study in junior high school at the age of twelve or thirteen (late learners). The selected target phonemes were word-medial approximants (/l, r/). Each nonword (i.e., *ala, ara*), produced by six talkers (three male and three female native speakers of American English), was combined with speech babble, using MATLAB and COLEA, with the signal-to-noise ratios (SNRs) 8 dB (medium noise) and 0 dB (quite high noise for L2 listeners). The discrimination test was given in the ABX format (e.g., A: *ala*, B: *ara*, X: *ala*), using E-Prime. The participants were asked whether the third word (X) was the same as the first (A) or second (B) in each trial. Results showed that although both groups of learners had their discrimination ability more negatively affected in the high noise condition and underwent the significant impact of talker differences ($p < .01$), the late learners discriminated /l/ and /r/ better than the early learners regardless of the noise and talker variability ($p < .05$). To identify possible factors affecting the late learners' better performance, a standard regression was run for the discrimination rates with several independent variables selected concerning their language learning experiences obtained from a language background questionnaire. The model revealed that the late learners' success could be accounted for by the following predictors: 1) classroom interaction with teacher and peers, 2) use of spoken English outside of classroom, and 3) English language proficiency. This may suggest that the age factor may not matter in the development of L2 speech discrimination skills in the situation of minimal exposure to a target language.

Keywords: age of learning, early language learning, phonemic discrimination, noise, talker variability

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Emotional arousal effects in monolingual and bilingual word processing

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*Sh*t* might be the first of the "Seven Words You Can Never Say on Television" (Carlin, 1972), but many people can in their daily interactions, and in all likelihood these are second language speakers. Indeed, research from bilingualism literature suggests that profane and obscene words – whose content is considered aesthetically offensive and verbally inappropriate, so-called *taboo* words (Napoli & Hoeksema, 2009) – are more readily used by second language (L2) speakers than by native language speakers. The source of this effect is less clear as it is tied to a number of factors, such as proficiency in L2, Age of Acquisition (AoA) of L2, or frequency of use of L2 (Harris, 2014). However, research so far has largely examined the behavior of late bilinguals, whose L2 context of learning, use and frequency may significantly vary across speakers, leading to contrasting and less conclusive findings (see Pavlenko, 2008 for a similar view). Moreover, research in the arousal effects of taboo words has focused on their use and ignored their perception (cf. Harris, 2004). The present study sought to fill these gaps. We used the Event Related Potential (ERP) technique and recorded the cerebral activity of thirty-four Spanish monolinguals and Catalan-Spanish balanced bilinguals who performed a semantic categorization task, while listening to neutral and taboo words in Spanish. Replicating previous findings from the emotional language literature (Carrettié et al., 2008; Eiola & Havelka, 2010), the behavioral results yielded longer latencies for emotionally arousing nouns than for neutral nouns in both groups. The electrophysiological results showed that the amplitude of the Late Positive Complex component, associated with emotional language processing, was larger (more positive) for taboo than for neutral words in both participant groups. Our findings have implications for models of bilingual word representation and word processing in general and of emotional word processing in particular. Importantly, they suggest that once proficiency, AoA, and L2 use are controlled, bilinguals and monolinguals process emotionally arousing words in a similar manner.

Keywords: spoken word processing; monolinguals; bilinguals; taboo words; ERPs

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Are speech sound disorders phonological or articulatory? A spectrum approach

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Statement of Issue: An articulatory disorder is one that is solely articulatory, that is, the child cannot produce the sound or sounds in question, e.g., lisping. A child with a phonological disorder also has an articulation problem, but the articulation is influenced by the acquisition of phonological representations. One way in which this may be seen involves a *substitution shift*, i.e., using a sound as a substitution but not as a correct consonant. An example would be producing /ʃ/ as [s], e.g., "shoe" [su], but producing /s/ as [t], e.g., "Sue" [tu]. Another way will be when the child shows an interaction between consonant correctness and word complexity. Another phonological example is when a child can produce a sound in simple words, but has lower rates of correctness as words become more complex, e.g., an /s/ in "Sue" versus an /s/ in "surprise".

Substitution shifts and effects of word complexity are common in typical phonological acquisition. They are also found in a subtype of children with speech sound disorders, those being children who are primarily having *phonological delay*. They are less common with other children who have speech sound disorders, who can be considered to be having a *phonological disorder*. The patterns of the latter group of children are not comparable to those of younger, typically developing children. These children are more apt to be unable to produce certain sounds regardless of word complexity. At the same time, they show patterns in their speech production that provide evidence that they are attempting to form and use phonological representations. That is, they do not solely have an articulation disorder.

Our presentation argues that children with speech sound disorders fall along a spectrum, with articulation at one end and phonology at the other, 'lisp > disorder > delay' in the above example. The issue becomes more interesting in the details. For any individual child, the challenge is to identify the aspects of that child's speech that are articulatory, and those that are phonological. We demonstrate this from a case study of a child CS with an SSD. CS's speech was examined by having him produce approximately 300 English words. CS could not produce any other fricatives than /f/, nor affricates, and liquids. The substitution patterns were /s/ and /ʃ/ [θ], /ʧ/ [t] or [θ], /z/ [ð], /ʤ/ [d] or [ð], /θ/ [f], /v/, /r/, /l/, [w]. We will present analyses showing which of these patterns are articulatory, and which are phonological.

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Real-time use of predictive cues in language processing by heritage Spanish speakers

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Previous research has shown that native Spanish speakers (i.e. monolinguals or Spanish- dominant bilinguals) are able to use grammatical information as a predictive cue when processing language in real-time. Evidence for this claim comes from a series of eye-tracking experiments, carried out with adults (Lew-Williams & Fernald, 2010) and children (Lew-Williams & Fernald, 2007), where faster reaction times were reported for looking to an aurally named picture when grammatical gender was a useful cue. However, high proficiency second language learners of Spanish do not show this facilitation effect (Grüter, Lew-Williams, & Fernald, 2012). The current study investigated real-time grammatical gender processing in a fourth group of speakers: heritage speakers, i.e., speakers who learned Spanish at home as a native language but who at the time of testing reported to be dominant in English. This group is of interest as their unique early language experience distinguishes them from second language learners. Employing a visual world eye-tracking paradigm, we examined whether Spanish heritage speakers (*N* =18) were able to use grammatical gender information encoded by the Spanish masculine article *el* and feminine article *la* ('the'). Participants were simultaneously presented with two pictures of objects while listening to a Spanish utterance that referred to one of the objects (e.g., *Mira la pelota. ¿La ves?* 'Look at the ball. Do you see it?'). Crucially, the objects presented either had the same (1a and 1b) or different (2a and 2b) grammatical gender.

(1) a. **el** caballo
the$_{MASC}$ horse
b. **el** zapato
the$_{MASC}$ shoe

(2) a. **el** caballo
the$_{MASC}$ horse
b. **la** pelota
the$_{FEM}$ ball

To assess whether these speakers can utilize grammatical gender to facilitate processing, the reaction time to initiate a shift in eye-movements towards the uttered object will be calculated from the onset of the article (i.e., the first moment in the utterance that provided relevant acoustic information to participants). Reaction times on same-gender trials and different-gender trials will be compared, where a faster reaction time on different-gender trials would indicate a facilitation effect. Data analysis is ongoing, however, it is expected that heritage speakers will show such a facilitation effect, given their early experience with Spanish. These findings would suggest that early language experience is an important and lasting component of native-like proficiency in adulthood, able to withstand years of reduced day-to-day use. Additionally, this research will provide new insights about divergent processing patterns observed in second language learners.

Keywords: processing, heritage speakers, eye-tracking

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Confusion patterns in Dutch L2 vowel production by Spanish L1 learners

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Speech processing in a second language (L2) is known to be influenced by the phonological system of the native language (L1). In our current line of research we study the influence of L1 Spanish on Dutch L2 speech production. Previously, we presented research based on annotations of Dutch L2 speech recordings of Spanish learners, which indicated that Spanish L1 vowels function as attractors of Dutch L2 vowels produced by Spanish learners (Burgos et al., 2014a). Further research based on acoustic analyses of Dutch L2 vowels produced by Spanish learners revealed that Dutch L2 Spanish learners produce Dutch vowels with spectral and durational properties that differ considerably from those of native Dutch vowels (Burgos et al., 2014b). The results of these analyses seem to confirm the attractor effect of the Spanish vowels. An interesting question at this point is how problematic or confusable these Spanish L1 Dutch vowels are.

A common way of establishing this is by having listeners evaluate vowel quality in perception experiments. However, this procedure draws heavily on subjective evaluations and as such it is error-prone. For this reason we explored more objective methods of investigating vowel quality and vowel confusability that can be applied to make comparisons between native and L2 learner vowels.

In this paper we report on a study on Dutch L2 vowel production by Spanish learners in which such an objective method is proposed and investigated. To find out to what extent the vowels realized by the Spanish learners could be classified as Dutch vowels, we computed Likelihood Ratios (LRs) by using a Gaussian statistical classifier. As features we use the duration of the vowels, and F1 and F2 measurements at 25%, 50% and 75% of the vowel length. All calculations were done using different combinations of the features (raw or normalized features, with or without duration). Gaussian statistical classifiers were trained for each vowel using native data, and then used to calculate likelihood ratios for both native and L2 learner data. LRs can vary from 1 (perfect match) to 0 (no match at all). These LRs are calculated for all combinations of vowels, yielding LR matrices which show which vowels are confusable (on the basis of objective acoustic measurements only). The native LR matrices can be used as a benchmark to evaluate the L2 confusion matrices.

The results reveal which vowels are more confusable in native speakers and L2 learners and confirm the presence of an attractor effect of the Spanish vowels on Dutch L2 vowel production. In addition, different calculations including the effect of duration produce results in which the attractor effect is attenuated. Possible implications of these results are discussed as well as directions for future research.

Keywords: L2 vowel production, likelihood ratios, Gaussian classifiers, confusion matrix

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Production and comprehension of the accusative case in monolingual Russian and bilingual Russian-Dutch and Russian-Hebrew children

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Knowing a language implies both speaking and understanding it, however, in child language for certain linguistic phenomena asymmetries in both directions have been reported between production and comprehension. This is the first study to explore the relation between production and comprehension of case endings in Russian in monolingual and bilingual children. Russian is a rich case language that realizes case features morphologically, whereas, Dutch and Hebrew have no morphological case inflections on nouns. Russian speaking monolingual children produce case inflections early on and acquire case with no difficulty (Cejtlin, 2009). Russian-Dutch and Russian-Hebrew bilingual children lag behind monolinguals in producing and processing case endings (Peeters-Podgaevskaja, 2008; Meir & Armon-Lotem, to appear; Janssen, Meir, Baker, & Armon-Lotem, to appear).

The current study investigates production and comprehension of the accusative case and explores the relation thereof in Russian in monolingual children and bilingual children with varying ages of onset (AoO) to Hebrew and Dutch. Seventy-two typically developing children participated in the study: 18 Russian-Dutch (*M*=5;5), 18 Russian-Hebrew (*M*=5;5), 18 monolingual Russian age-matched (*M*=5;5), and 18 younger Russian monolingual (*M*=4;2). A case elicitation task was used to test accusative case production; an online sentence comprehension task was administered to test the comprehension of simple transitive sentences both in SVO and OVS with objects in the accusative case. A one-way Anova test demonstrated that the monolinguals outperformed both bilingual groups both on production and on comprehension of accusatives in OVS ($p<.001$). No significant differences between the two monolingual groups nor between the two bilingual groups were detected. To test if there is an asymmetry between comprehension and production a repeated measures Anova was performed (comprehension vs. production). A significant main effect of task was found ($p<.001$) with higher scores on production compared to comprehension. A significant TASK*GROUP interaction was detected ($p<.001$). Paired t-tests confirmed an asymmetry for both monolingual groups ($p<.001$) with higher scores on production, while no significant differences between production and comprehension were observed for bilinguals. Furthermore, accusative case production was found to be correlated with AoO and home language policy: children with more Russian at home and a later onset to the sparse case language were more successful in case production.

The results of our study demonstrate an asymmetry between production and comprehension for monolingual children only: they are at ceiling on production of accusative case inflection as early as the age of 4, whereas their comprehension slightly lags behind. By contrast, bilingual children have profound difficulties with both case production and comprehension across the board under the influence of a sparse case language of society.

Keywords: child bilingualism, case morphology, production, comprehension

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Voice onset time of the voiceless dental and velar stops in bilingual Hungarian-English children and their monolingual Hungarian peers

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Voiced and voiceless stop consonant contrasts vary in terms of voice onset time (VOT) across different languages, which may pose challenges for bilinguals who learn languages that differ in this respect. Hungarian has a voicing lead for voiced stops and short lag for their voiceless counterparts while English voiced stops tend to have short lag while voiceless stops have long lag (VOT). Consequently, the VOT of Hungarian voiceless stops overlap with the English voiced counterparts, which may present a challenge for Hungarian-English bilinguals.

This study addresses the above-named problem by investigating the VOTs of the two most common voiceless stops in Hungarian: /t/ and /k/, which are analyzed in the speech of bilingual Hungarian-English children and monolingual Hungarian children. The research question was whether bilingual Hungarian- and English-speaking children produce the voiceless dental and velar stop VOTs similarly to their monolingual Hungarian-speaking peers. We hypothesized that (1) VOT is longer in the speech of bilingual children when they speak Hungarian compared to their monolingual Hungarian-speaking peers' VOTs. (2) This difference is observed regardless of the type of speech in initial position in a picture naming test versus in spontaneous narratives. (3) The speech task highly influences VOTs.

Ten bilingual Hungarian-English children (mean age: 6;6) and 10 monolingual Hungarian children participated in the study (mean age: 6;6). All bilingual children lived in Hungary for years and learned English at an American school in Budapest, Hungary. Monolingual Hungarian-speaking children attended public elementary school and were not learning a language other than Hungarian at the time of the study. None of the participants had known cognitive, speech, language, or hearing disorders based on school evaluation.

A single-word picture naming task (using images of animals or everyday objects that were age-appropriate) was used to elicit word-initial, singleton stops in stressed position. Children were also asked to talk about school or free time, prompting narratives from which 10 /t/ and /k/ phonemes in CV position were selected for VOT analysis.

PRAAT 5.0 was used to analyze the VOT values of word-initial, singleton, stressed /t/ and /k/ phonemes from both the picture elicitation task and the narrative. Independent variables included language status and task. The dependent variable was the average duration of /t/ and /k/ per child per task. Statistical analysis (one-way ANOVA) was carried out by SPSS.

Results showed that bilingual children's VOTs are approximately twice as long as those of their monolingual peers, irrespective of the type of task. There is also a statistically significant difference between the two types of speech tasks. Our findings indicate that bilingual Hungarian-English-speaking children produce their voiceless stops differently from their monolingual peers, and there is also a task effect.

Keywords: voiced onset time, consonant contrast, bilingual and monolingual children

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The influence of semantic complexity on verb naming in developmental and acquired language impairments

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Difficulties with verb confrontation naming are explored for four language-impaired populations, all speakers of Greek: children with SLI (n=14) and adults with aphasia (fluent and non-fluent; n=20), schizophrenia (n=20), and multiple sclerosis (MS; n=31). These will be compared to non-impaired control groups matched on age, gender, education, and socio-economic status. Focus lies on semantically complex verbs that require an obligatory instrument to perform the action such as instrumental verbs (e.g., *sweep* requires a broom), verbs that do not, such as non-instrumental verbs (e.g., *climb* a mountain/tree/ladder), and verbs that have a lexical link between the instrument and the verb (e.g., *the saw-to saw*).

The semantic complexity theory purports that verbs with semantic richness (i.e. "heavy verbs") are more predictable from the semantic input compared to verbs specified by fewer semantic features which favour syntactic input (i.e. "light verbs"). With regards to instrumental verbs the semantic/conceptual relationship connecting the verb with the semantic features of the noun with which it co-occurs increases lexical-semantic complexity:

(1) instrument → [x ACT <INSTRUMENT>] (e.g., brush, hammer, saw, shovel, sweep)

All adult participants were tested on the Greek Object and Action (GOAT) test, while the children with SLI and their controls were tested on the Cypriot version of the tool (COAT) as they reside in Cyprus. Group performances on verb comprehension was close to ceiling prior to the naming study.

Participants were asked to name 42 coloured photographs of verbs divided into (i) instrumental verbs, (ii) instrumental verbs with a name relation, and (iii) non-instrumental verbs, all measured across verb types for word length, word frequency, imageability, picture complexity, and age-of-acquisition.

Results revealed similarities and differences in performance between the different language-impaired groups for instrumentality and name relation: a positive effect for both features that facilitated verb naming accuracy (e.g., for the MS group), no effect for either feature (e.g., for the group with schizophrenia), or a positive effect of instrumentality only (e.g., for the anomic aphasic group) versus a negative effect (for the Broca aphasic group) and a positive effect of name relation only (e.g., for children with SLI).

Overall, the results provide evidence for the role of semantic richness in verb picture naming and for its different impact on concept processing across different language impaired populations. Findings will be interpreted in terms of influential word retrieval models and linked to the neurobiological underpinnings of verb processing.

Keywords: instrumental verbs, name relation, Object- and Action-naming Test (OAT)

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Structural language deficits in a child with DiGeorge syndrome (DGS): Evidence from Greek

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This study presents an investigation of language skills in a male child with DiGeorge syndrome (DGS), an autosomal dominant genetic disorder caused by the deletion of a small piece of chromosome 22 (aka 22q11.2 deletion syndrome). The syndrome is associated with an extensive and variable phenotype including mild differences in facial features, congenital heart disease, defects in the palate (velopharyngeal insufficiency), recurrent ear infections, learning problems, and behavioural and social interaction difficulties (Solot et al., 2001). Delayed language onset and persistent language impairment in preschool ages have been described (Persson et al., 2006). Not much is known about language skills of DGS children. The purpose of this study is to describe the language profile of a single child with DGS using case-based methodology, and to compare his performance on structured language tasks with two typically language developing children, one of the same age and one two years younger. We also compared DGS performance with those reported for preschool children with specific language impairment (SLI) from our database on the same tests. The participant (PO), a native Greek speaker from Cyprus, was 5 years and 8 months of age when testing began and enrolled in a normal mainstream preschool at the time of the study. He was receiving speech therapy on a weekly basis focused on his articulation (e.g., hypernasality) and voice problems (e.g., hoarse quality). He had fluent, intelligible speech and was verbose. Receptive and expressive language scores were derived from the Diagnostic Verbal IQ Test (Stavrakaki & Tsimpli, 2000) prior to the testing on structured language tasks. Non-verbal intelligence was measured with the Raven's Coloured Progressive Matrices (Raven et al., 2008). There was no evidence of attention deficit/hyperactivity disorder on one-to-one testing. Structural language testing involved (i) comprehension of subject and object relative clauses (Theodorou, 2013), (ii) comprehension of Wh-questions (Papadopoulou, 2014), and (iii) a narrative retell task where MLU, number of subordinate clauses produced, and number of t-units produced were calculated (Theodorou & Grohmann, 2010). We were further interested in determining whether language and nonverbal cognitive ability had a strong association. The findings will be discussed in relation to two hypotheses, namely (i) that the profile of language impairment in children with DGS may be distinctive to this syndrome, and (ii) that there may be a possibility of co-morbidity of SLI in DGS.

Keywords: assessment, co-morbidity, genetic factors, language impairment, lexicon, syntax

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The MAIN of narrative performance: Russian-Greek bilingual children in Cyprus

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Narratives can help identify linguistic, cognitive, semantic, and social abilities as well as communicative competence and cultural awareness of a child (e.g., Paradis et al., 2010). In fact it has been argued that narrative skills are important for children's success at school, as evidenced by a close relationship between oral language skills and literacy (Snow, 2002). As research shows, cultural communities, language environment, home language use, parental attitudes towards bilingual and bi-cultural learning, and the level of language proficiency are some of the factors that can affect the development of narrative abilities (e.g., Jia et al., 2011).

The present study investigates the narrative production of bilingual children with typical development in both their languages: Russian and Cypriot Greek. A total of 23 simultaneous bilingual children across different age groups (from 3 to 11 years) have so far been tested with MAIN, the Multilingual Assessment Instrument for Narratives (Gagarina et al., 2012), a tool developed in COST Action IS0804 'Language Impairment in a Multilingual Society: Linguistic Patterns and the Road to Assessment'. All participants were also tested on a large battery of tests: the Developmental Verbal IQ Test, adapted to Cypriot Greek from Stavrakaki & Tsimpli's (2000) Standard Modern Greek original (Theodorou, 2013), the Russian Proficiency Test for Multilingual Children (Gagarina et al., 2010), and several tasks assessing executive functions (digit span test, word span test, fluency test, Raven's matrices).

With regard to narrative abilities, the bilingual children performed similarly across their two languages. Their performance was higher on the retelling condition in comparison to the telling condition. This is not a surprising finding, since retelling is considered to be easier than telling, though it is not just a repetition of a story but its reconstruction in detail and grammatical, lexical and content accuracy (Schneider et al., 2006). As expected, the bilingual children's narrative abilities also improve with age, although the number of participants in each age group is too low to allow a concrete generalization. However, a comparison of the participants' (telling and retelling) narrative performance with that of monolingual Cypriot Greek- and monolingual Russian-speaking children (Gagarina et al., 2012) shows that these outperform their bilingual peers mainly in story structure and internal state terms.

Bilingual children have been shown to lag behind their monolingual peers in terms of structural complexity as they are not able to produce complete and well-formed episodes and lack the understanding of narrative schemata, causality, perspective-taking, ability to plan, and meta-awareness (Westby, 2005). In our talk, we will also link the bilingual children's narrative performance with other variables we have collected data for such as the Greek DVIQ scores, Russian Proficiency Test scores, and schooling as well as chronological age.

Keywords: cognition, macrostructure, microstructure, telling, retelling

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The influence of language combination and proficiency on bilingual lexical access

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The present study examines the nature of bilingual lexical access via category fluency across a variety of language combinations. Current theoretical models suggest that there is nonselective access across the two languages of a bilingual speaker. Previous category fluency studies have not found differences in lexical access in L1 and L2 and results are mixed across particular languages (Kempler, Teng, Dick, Taussig, & Davis, 1998; Pekkala, Goral, Hyun, Obler, Erkinjuntti, & Albert, 2009). Results have also been inconclusive regarding the effects of proficiency on category fluency (Luo, Luk, & Bialystok, 2010). The present study, therefore, was a systematic examination of the nature of lexical access in English and a variety of L2 languages.

One hundred and nine speakers of five language combinations (Hindi-English, Kannada-English, Mandarin-English, Spanish-English, and Turkish-English) completed a category fluency task in each of their languages in three main categories (animals, clothing, food), each with two subcategories, as well as a questionnaire assessing their proficiency in each of their languages. Multivariate analyses of variance revealed that the number of correct items named across the three main categories varied across the different groups for English items in a category fluency task, but not for the same task in speakers' other language. Specifically, Hindi-English and Spanish-English speakers produced significantly more English words across the three main categories than did speakers of Turkish-English and Mandarin-English. There were no significant differences between the numbers of items produced in the other language for these different bilinguals. Across all five language groups, participants produced more correct items in English than they did in their other language. Regression analyses showed that the amount of exposure participants had to each of their languages and their confidence in each language predicted the number of correct items they produced in English, but not in their other language. Additional analyses of variance found significant differences in the number of correct items named in each subcategory in both English and participants' other language based on language combination. These results demonstrate the effects of particular languages on bilingual lexical access and provide insight into the role of proficiency and degree of bilingualism on access.

Keywords: bilingualism, lexical access, category fluency, proficiency

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Testing hypotheses on frequency effects in first language acquisition - noun plural inflection in Danish children

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On the basis of extensive literature studies, Ambridge, Kidd, Rowland, & Theakston (*JCL*, 2015) present five theses on frequency effects on language acquisition:

- *Levels and Kinds Thesis*. Frequency effects exist at all levels and are of many different kinds (e.g., type and token frequency effects as well as absolute and relative frequency).
- *Age of Acquisition (AoA) Thesis*. All other things being equal, frequent forms will be acquired before less-frequent forms. Since all other things are not equal, this claim does not entail a one-to-one relationship between frequency and age of acquisition.
- *Prevent Error Thesis*. High-frequency forms prevent (or reduce) errors in contexts in which they are the target.
- *Cause Error Thesis.* High-frequency forms also cause error in contexts in which a competing, related lower-frequency form is the target.
- *Interaction Thesis*. Frequency effects will interact with other effects.

The acquisition of the Danish noun plural system is particularly interesting in this regard. The reason is that where English is characterized by having one default inflectional marker for a grammatical category (e.g., the plural suffix *-s*) and a minor number of exceptions to this default rule, Danish has several competing inflectional markers. Furthermore, there are important interactions between phonetics/phonology and morphology in the Danish system (Kjærbæk, dePont Christensen, & Basbøll, *NJL*, 2014).

In this study we will test the theses in a phonetic/phonological perspective and explore the impact of phonetics on grammar. This we will do in two types of empirical data from children acquiring Danish as their first language:

- *Naturalistic data*. Spontaneous child language input and output from two monolingual children in the age of 1-3 years – and their parents.
- *Experimental data*. Picture based elicitation task with 160 monolingual children between 3-10 years. The test material consists of 48 stimulus items.

In the analyses we will use a scale with three degrees of productivity. Productivity is here defined as the ability of the inflectional marker to occur on new words. For the plural system this means the ability to add the plural marker (stem change + suffix) to a new noun in order to form a new plural noun. Productivity scale for the Danish plural markers:

- *Fully Productive*. ɐ-schwa suffix without phonemic stem change.
- *Semi Productive*. ə-schwa and zero suffix without phonemic stem change.
- *Unproductive*. Markers with phonemic stem change and markers with the foreign suffixes *-s*, *-a* and *-i*.

Keywords: first language acquisition, inflectional morphology, noun plural, frequency, productivity

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On the anaphoric interpretation of null and overt pronouns: Does superficial structural similarity have any predictive power?

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The anaphoric interpretation of null and overt subjects has been investigated in the context of the traditional definition of the null subject parameter (Belleti et al., 2007) and Carminati's (2002) Position of Antecedent Hypothesis (PAH), according to which null pronouns opt for a structurally-prominent antecedent while overt pronouns prefer an antecedent in a lower position (1)-(2). While this hypothesis has been shown to hold for L1 speakers of [+null subject] Romance languages, it cannot account for the fact that L1 speakers of [-null subject] languages (such as English) with advanced proficiency in an L2 [+null subject] language behave like L1 [+null subject] speakers in the case of null (i.e. Alonso Ovalle, 2007), but not overt subjects (i.e. Sorace & Filiaci, 2006). We propose that to account for this we must move past the null/overt subject dichotomy, considering that there are also weak and strong overt subjects which have syncretic forms in English and Spanish but are instantiated by different lexical items in languages such as French.

In this study, 15 L1 English-L2 Spanish, 11 L1 French-L2 Spanish, and 20 L1 Spanish speakers performed an acceptability judgment task in Spanish in which they were asked to rate responses to questions about sentences such as (1) and (2).

Results show that in forward anaphora (3), L1 English and L1 French speakers pattern together in their preference for subject antecedents with null subjects. With overt subjects, however, the L1 English group behaves like the L1 Spanish group in their preference for object antecedents while the L1 French group trends toward subject antecedents. In backward anaphora (4) we see that both non-native groups significantly prefer the subject antecedent for both null and overt subjects ($p=.010$) which we interpret as a processing strategy that selects the antecedent that is linearly the closest. The L1 French group's preference for subject antecedents with overt pronouns is unexpected under the traditional view of the null subject parameter and the PAH. However, this can be explained as the French speakers interpreting overt Spanish pronouns as French clitics since Spanish does not have lexically-distinguished overt pronouns. Thus, differentiating between null and overt subjects in Spanish may be easier for L1 English speakers as they may simply interpret null subjects as weak and overt subjects as strong.

Our data show that the superficial structural similarity that groups English and French as [–null subject] may be misleading when it comes to determining how these languages shape the selection of subject antecedents in L2 Spanish. We argue that the diverse results in L2 anaphora resolution are attributable to the fact that Spanish overt pronouns can be interpreted as weak or strong while French weak and strong overt pronouns have distinct lexical realizations.

(1) Juan$_i$ saludó a Pablo$_j$ mientras $\varnothing_i$ / él$_j$ tocaba la guitarra — FORWARD ANAPHORA
Juan greeted Pablo while $\varnothing_i$ / he$_j$ was playing the guitar

(2) Mientras $\varnothing_i$ / él$_j$ tocaba la guitarra, Juan$_i$ saludó a Pablo — BACKWARD ANAPHORA
While $\varnothing_i$ / he$_j$ was playing the guitar, Juan$_i$ greeted Pablo

Keywords: strong, weak and clitic subject pronouns, anaphora, null subject parameter, structurally-prominent antecedents, linearly-closest antecedents

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Consonant context effect on the lingual articulation of French /u/ and /y/ in Japanese learners of French receiving conventional and ultrasound pronunciation training

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The research presented here forms part of an ongoing study investigating the effect of using ultrasound (US) as a visual feedback tool in the remediation of French /u/ and /y/ in Japanese learners of French. The two sounds are articulatory different from Japanese /u/, a high non-front vowel in the Tokyo variety, with the tongue less retracted and lips less rounded than in French /u/ (Bothorel et al., 1986). Japanese learners of French commonly have difficulties producing them correctly (Kamiyama & Vaissière, 2009). Earlier analysis of isolated vowels has revealed that US lessons have a positive effect on the production of /u/ and /y/ (Pillot-Loiseau et al., 2014). The data presented here focuses on the effect of place of articulation of a preceding consonant (uvular - facilitating for /u/, dental - facilitating for /y/, bilabial - neutral) on the two vowels. Seven adult Japanese learners of French, taking a 12 weeks conventional pronunciation course, participated in the study. Four of them (EXPs) received three 45-minute lessons in which US provided visual feedback for lingual articulation of /u/ and /y/. /u/ was practiced more because the learners had more difficulties with it. The training progressed from isolated vowels to non-words, real words and sentences. The remaining three learners (CTRs) did not receive such training. US and audio data (ten repetitions of isolated vowels, non-words, words, sentences, Japanese /u/) of the EXPs were recorded three times: one week before the ultrasound lessons (T1), one week after (T2) and two months after (T3). The CTRs were recorded twice, at times corresponding to T1 and T2. One native French speaker (NS) was recorded as well. Analysis presented here is focused on words du (/dy/), doux (/du/), rue (/ʁy/) and roue (/ʁu/), but also compared to vowels produced in isolation. Articulation is evaluated by extracting the tongue contours and comparing their shape and position, as well as the highest point on the curves. Preliminary results of one EXP, one CTR and NS reveal important qualitative differences. NS shows expected coarticulatory effects of /ʁ/ and /d/ on the vowels, with /u/ in /ʁu/ aligned with isolated /u/ and /y/ in /dy/ aligned with isolated /y/. Over time, EXP shows a greater distinction of the two vowels in all contexts; however at T3, /y/ from all three contexts (/dy, /ʁy/, isolated) are aligned, with no effect of a facilitating context, while /u/ in /ʁu/ is further back than the rest. CTR shows considerate overlap of shape and position of tongue contour in all three contexts and no improvement over time.

Keywords: French as foreign language, L2 vowels, Japanese speakers, lingual articulation, ultrasound as visual feedback

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Speech intelligibility and socio-pragmatic skills of children with cochlear implant

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The deaf child has to accomplish a variety of things concerning language (communication with parents and family members, acculturation into two worlds: hearing and of the Deaf, acquiring knowledge, developing cognitive abilities in infancy…). Every deaf child no matter what level his/her hearing loss is, should have the right to grow up as bilingual. By knowing and using both languages, the child can attain his/her full linguistic, cognitive and social capabilities. We all know that poor intelligibility of child's speech can lead to various problems and can have negative impact on different areas of a child's development. Both segmental and supra-segmental speech features are developed with the help of hearing and that is why speech becomes more understandable, clear and correct. The speech of the deaf child with cochlear implant and the speech of the hard of hearing child may differ significantly from the quality of the speech of the hearing child. Therefore, the listener's understanding who is not used to that kind of speech is a big challenge. Intelligible speech enables us to communicate effectively and to be socially included into wider society. Along with this, the importance of socio-pragmatic skills is also crucial. A child can develop and improve these socio-pragmatic skills with a supportive environment. Assertiveness and responsiveness are essential for verbal and non-verbal communication and they are reflected in different levels of social interaction.

The aim of the research was to describe and analyze socio-pragmatic skills of deaf children with cochlear implant and to evaluate their speech intelligibility. For the purpose of this research, two instruments adapted into Slovene language were used. This kind of research is the first of a kind in our country. The results show that children with cochlear implant (CI) effectively used both communication skills (assertiveness and responsiveness). Speech intelligibility results show a high degree of clear, accurate speech and language in children with CI. We can conclude that most children with CI have intelligible speech and clear articulation. Different communication partners who enter into their communication space can understand them.

Early intervention and rehabilitation and awareness of parents about the importance of these skills have a significant impact on the achievement of higher level of the language.

Keywords: deaf children with cochlear implant, speech intelligibility, socio-pragmatic skills, bilingualism

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Transfer phenomena in instructed L3 speech learning: The case of L3 Spanish child learners in Germany

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Research into third language (L3) acquisition has expanded greatly in recent years, bringing some important insights into our understanding of multilingual acquisition, particularly in the areas of lexis and morphosyntax. Empirical studies in the realm of L3 phonology, however, remain scarce and what exists is oriented towards investigations of cross-linguistic influence (CLI) in adult L3 phonological acquisition (for a review see, e.g., Cabrelli Amaro, 2012). The findings of these studies suggest that both the L1 and L2 sound systems affect L3 speech production, depending on a range of factors which can converge and interact to either increase or decrease the likelihood of transfer. Among these, the key factors appear to be psychotypology and proficiency. The possibility for L3 regressive transfer, i.e. CLI in which the L3 affects the L2 and/or L1, has rarely been considered, however, despite the main tenet of the field on the multidirectional nature of cross-linguistic interaction in the course of additional language acquisition (e.g., Cenoz, 2013; Jessner, 2008). Whether the same and/or additional factors condition L3 regressive transfer and to what extent the interactions between the phonological systems of young L3 learners compare to those identified to date in adult L3 speech learning is still to be examined.

The present paper aims to address these two questions by reporting findings from a longitudinal research project on possible sources and direction of cross-linguistic phonological influence in L3 segmental acquisition by child instructed learners. A group of 19 children (aged 11) who were acquiring Spanish at a grammar school in Germany and who also had knowledge of (instructed) English participated in the project. The young learners´ productions of rhotic sounds in Spanish, English and German were recorded on three occasions: twice in the first year of learning Spanish and then two years later. The acoustic analyses of their L3 productions elicited by tasks of different cognitive complexity (picture naming task, reading-on-your-own, and interview) as well as L2 and L1 productions (interview) offer evidence of different CLI phenomena, with one of the more prominent variables at play being (interlanguage) phonological awareness. The main implications of this finding for phonological acquisition research and language education will be discussed.

Keywords: L3 speech, phonological awareness, phonological transfer, child L3 learner

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Methods in code-switching research: The value of monolingual judgments

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Of the various methodological concerns specific to code-switching (CS) research, ascertaining best practices in data collection and interpretation is of utmost priority. Expanding on a notion proposed by González-Vilbazo et al. (2013), the current paper argues for the inclusion of monolingual judgments in CS experiments. While the original proposal aimed to eliminate dialectal differences, the current study focuses squarely on the interpretation of the results. Specifically, comparisons in the pattern of acceptability for monolingual and code-switched stimuli may reveal important aspects that would otherwise be obscured.

Spanish/English bilinguals (*N*=18) completed an aural acceptability judgment task using a seven-point Likert scale. The stimuli were spoken code-switched sentences involving pronouns in varied contexts - e.g., unaltered contexts (1a) or modified contexts (1b)—as well as coordination, clefting, hanging topic and prosodic stress.

(1) a. *He* trabaja demasiado.
works too-much

b. *Him with the blue eyes* trabaja demasiado.
works too-much

The same participants then provided judgments on the monolingual equivalents of these stimuli in both languages. The results of the CS judgments show three tiers of acceptability. Coordinated pronouns were rated most acceptable (*M*=5.98), significantly higher than all other contexts (*p*-values < .05). Next, cleft, modified and prosodically-stressed pronouns patterned together (*p*-values > .05), receiving slightly reduced ratings (*M*=4.91). Finally, hanging-topic and unaltered pronouns patterned together ($p < .341$) with little acceptability (*M*=2.68), significantly lower than all other contexts (*p*-values < .001). These results on their own would suggest that the final two contexts are completely unacceptable in CS, whereas all other contexts are acceptable and/or marginally acceptable.

When analyzed in conjunction with monolingual judgments, however, more fine-tuned insight can be obtained. First, there were no significant differences between monolingual and CS stimuli for the cleft, coordinated, hanging-topic and modified contexts (*p*-values > .05). While these contexts differ from each other in terms of acceptability, importantly these differences are not unique to CS. Significant and informative differences did emerge, though, with prosodically-stressed pronouns, which were rated significantly higher in monolingual Spanish or English than in CS ($p < .001$), receiving scores at ceiling (*M*=6.87*)*. This comparison with monolingual data distinctively uncovers how prosodic stress results in marginal acceptability for code-switched pronouns. Furthermore, unaltered pronouns were also rated significantly higher in monolingual stimuli ($p < .001$), similarly receiving scores at ceiling (*M*=6.91). Given this crucial contrast, we can reliably confirm that only unaltered pronouns are completely unacceptable in CS. By including a monolingual comparison, we can isolate the effects that are unique to CS. Absent this data, the results may be unreliable. The current work has a direct impact on future studies, providing evidence in support of monolingual stimuli in experimental CS research.

Keywords: code-switching, methodology, acceptability judgments, pronouns

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Adjustments in foot-structure by French L2 learners of English in spontaneous speech: Short and long term effects

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The present study evaluates the production of foot-structure by French learners of English in a series of spontaneous conversations with American English speaking Tandem partners. While the evidence for the division of languages into distinct rhythm classes remains inconsistent (Arvaniti, 2012), there is consensus that languages differ in their overall rhythmic tendencies and that the foot has a status as a temporal unit of speech production in English (Kim & Cole, 2005; Asu & Nolan, 2006). Support for the latter comes from the phenomenon of polysyllabic shortening, i.e. as the number of syllables within a foot increases, the duration of each syllable, in particular the stressed syllable, is shortened even though the duration of the foot is lengthened. The question we investigate in this study is to what degree French learners of English (with French claimed to be 'syllable-timed') show a comparable pattern of polysyllabic compression in spontaneous L2 speech. Moreover, we are interested in whether French learners adjust, or become more similar, in their rhythmic patterns to those of their interlocutors during a single conversational session, and/or to what extent these patterns change over time as a result of long-term exposure.

We used five language pairs of native speakers of French (F) and American English (GA) of the SITAF corpus of English-French interactions (Horgues & Scheuer, 2014). For each pair, two conversations (7-8 minutes each), four months apart, were analysed on foot and stress syllable as a function of the number of syllables in a foot.

To date, the data of two pairs have been analyzed (with the results of the remaining pairs available by the time of the conference). While subject F1 shows a clear pattern of polysyllabic shortening, subject F2 shows a prominent interference of the rhythmic properties between her L1 and L2 – with a strong increase in foot duration as a function of syllable count. This increase is only partially due to a weaker compression of the stressed syllable component, but more prominently due to a lack of drastic reduction in unstressed syllable position. Comparing the foot-structure in early and late samples of each conversation between GA and French speakers, we found little evidence for short-term rhythmic adjustments. However, there is an overall tendency for subject F2 to improve over-time with stronger durational shortening at the end of the four-month period. The results with be discussed in light of the different mechanisms underlying L2 rhythm as well as methodological problems in defining syllables and feet in English.

Keywords: L2 speech, speech rhythm, foot-structure, L1-L2 convergence, English, French

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Speech rate plays marginal role in processes of connected speech

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Connected speech is subject to massive reduction of sounds (Johnson, 2004). Typically, vowels are studied in the reductionist paradigm; in comparison, processes affecting consonants received little scholarly attention. Particularly striking is the scarcity of attempts to quantify the processes, the studies of Hannisdal (2006) and Watson (2006) being rare exceptions. In the literature, one can find statements such as "in connected speech, /m/ frequently results from final /n/ of the citation form before a following bilabial" (Cruttenden, 2008:311). Thus, the study seeks to reduce the arbitrariness surrounding the question "how frequent *frequent* is" by establishing the frequency of occurrence for processes of connected speech. The second aim consists in correlating processes with speech rate, hypothesizing that gradient processes (fricativization, assimilation, Yod coalescence) are more rate-sensitive than the categorical ones (/d, t, h/ deletion).

To verify these hypotheses, auditory and acoustic analysis was performed on 4.5 hrs of speech of 9 Lancashire speakers (the PAC corpus, Phonologie de l'Anglais Contemporain). The possibility of correlation between processes and rate (measured as syllables per second and normalized) was operationalized with multivariate regression.

As for the first aim, the following ranking emerges: /d/ deletion (34 per cent), /t/ deletion (30 per cent), /h/ deletion (19 per cent), fricativization (11 per cent), yod coalescence (3 per cent) and assimilation of place (2 per cent). In accounting for frequency of occurrence, two factors should be considered: lexical frequency and interspeaker variability. As for the former, for instance, the word *and* constituted 68 per cent of all /d/ deletion processes, *just* made up 21 per cent of /t/ deletion. With regard to the latter, speaker LB alone produced 67 per cent of all fricativization processes, SC's contribution /h/ deletion was 27 per cent. Turning to interspeaker variability, it was very evident in gradient processes, whereas categorical processes were distributed among speakers more evenly.

A surprising finding is that rate effects, with exception of /t/ deletion, were not observed for individual processes nor across the gradient/categorical division (r=-0,38 for categorical processes and 0.09 for the gradual ones), implying that occurrence of a process is not a function of rate. In addition to rate, age and education was examined with multiple regression, yielding no correlation (r=0.12, R^2=0.25). This points to a less significant role of tempo for consonants in connected speech than it is widely assumed. A plausible explanation might be derived from the semiotic principle of figure and ground; if consonants are figures, they may, unlike vowels, be resistant to speech rate in order to preserve the phonetic shape of a word.

Keywords: connected speech, consonants, frequency, rate

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Early vocal development of typically developing children acquiring German

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Background & Aim: Advancements in the early vocal development are considered to be foundational for the later speech acquisition process. To deepen our understanding of the process children have to pass longitudinal studies investigating the developmental progress from babbling to the use of words and word combinations are necessary. Hardly any longitudinal data about the early process of speech acquisition in German exist. Thus the aim of the present study was to examine the sequence, time-course and quality of the early vocal development during the first 18 months of life.
Method: In a prospective longitudinal research design, the early vocal development of 15 monolingual German infants was investigated. Mother-child interaction sequences were video-taped on a monthly basis for the first 18 months. Vocalizations were classified according to the consolidated SAEVD-R (Ertmer & Jung, 2011) differentiating precanonical vocalizations, basic canonical syllables, and advanced form vocalizations. Furthermore, child utterances were classified as non-words, single words, or word combinations.
Results: Results so far indicate that the consolidated SAEVD-R developed for English children can be used to reliably identify and classify the early vocalizations of infants acquiring German. For all children first canonical syllables emerged between 5 and 10 months of age, predominantly represented by single CV-syllables and disyllables. Increases of canonical syllables to substantial amounts of ≥ 20% (see Ertmer & Jung, 2011) varied across the children.
Discussion: The first emergence of canonical syllables between 5 and 10 months of age is concurrent with data from English-speaking children (Oller, 2000). However, analyses so far also suggest that for some of the German children basic canonical syllables increased to substantial amounts at 6-8 months of age, which is earlier than reported for their English peers using the same definitions (Nathani et al., 2006; Ertmer & Jung, 2011). Further analysis of the sequence, time-course and quality of early vocal development revealing similarities and differences between German and English infants will be discussed.

Keywords: early vocal development, canonical babbling, German

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Effects of English onset restrictions and universal markedness on listeners' perception of English onset sequences resulting from schwa deletion

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A considerable body of research on speech perception found that L1 phonotactic restrictions play a key role in the perception of not only L1 (Massaro & Cohen 1983) but also L2 sound sequences (Dupoux et al. 1999). However, Berent et al. (2007, 2008, 2009) found that listeners' perception of onset clusters can be affected by the sonority-driven onset markedness in addition to L1 phonotactic restrictions. Specifically, they reported that onset clusters of sonority rises tended to be perceived more accurately than onsets of sonority levels, which were in turn perceived more accurately than onset clusters of sonority falls (e.g., *bwif/dlaf* vs. *bdif/tpif.* vs. *lbif/mdip*) across different L1 listener groups. Although English admits only onset sequences of a large sonority rise like /bl/ and /gr/, certain prohibited onset clusters can emerge due to word-initial schwa deletion (e.g., *banana* [**bn**ænə], *potato* [**pt**éɪroʊ]). Thus, the study investigated whether both L1 and L2 listeners were perceptually sensitive to the sonority-based onset markedness as well as to English legal vs. illegal onset clusters derived from word-initial schwa deletion. Native English listeners and native Korean and Japanese listeners participated in the discrimination tests. The experimental stimuli were made up of 28 bisyllablic and 28 trisyllabic English nonce words on the basis of Lee (2011). More specifically, 112 identical (e.g., *patoo—patoo, ptoo—ptoo;* nafamic—nafamic, nfamic—nfamic) and non-identical pairs each (e.g., *patoo—ptoo, ptoo—patoo;* nafamic—nfamic, nfamic— nafamic) resulting from initial schwa deletion were created from 56 nonce words; words with onsets of a sonority rise (e.g., *kl*), flat (e.g., **pt*), and fall (e.g., **nf*) were constructed. Participants were requested to determine whether aurally presented two stimulus words were identical or not by pressing a key on a keyboard. The results of accuracy indicated that English and Korean listeners were able to differentiate between well-formed and ill-formed English onset clusters and reaction latency showed a similar trend. Importantly, the results of the sonority profiles were consistent with the findings of Berent et al., since all the listeners showed an illusionary vowel effect as a function of the onset markedness irrespective of their L1s. That is, the listeners tended to equate schwa deleted forms with their corresponding vowel intact forms (Spinelli et al., 2007). The findings are further discussed in terms of L1 phonotactic restrictions, universal markedness, lexical representations, and L2 listeners' English proficiency.

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Factors in the identification of English vowels by L2 listeners

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L2 learners are known to have much difficulty differentiating English vowel categories due to factors such as L1 interference, age of L2 acquisition and L2 experience (Flege et al., 1997; Flege & MacKay, 2011). However, not many studies have examined the effect of dialect differences in English on L2 learners' English vowel perception although dialect differences play a role in native and non-native English speakers' vowel perception (Escudero & Boersma, 2004; Evans & Iverson, 2004) and dialect differences could present considerable difficulty to L2 learners. Several vowels like /æ, a/ (*bat*) and /ɑ, ɒ/ (*hot*) are realized differently between American and British English. Thus, this study explored how L2 learners adjusted L2 vowel perception based on their experience with their target dialect (General American English (GAE) vs. Standard Southern British English (SSBE)). The study also investigated whether L2 learners showed vowel category variation and the interlanguage speech intelligibility benefit, especially talker effects (Hayes-Harb et al., 2008), in identifying L2 vowels depending on their target dialect. Thirty-six Korean EFL learners (English as a foreign language) mainly exposed to GAE, 27 Korean ESL-US learners (English as a second language in US), and 33 Korean ESL-UK learners (English as a second language in UK) participated in vowel identification task (mean age=26 years). Both the ESL-US and ESL-UK learners had prior experience with GAE when they were in Korea. The stimuli, produced by 8 native and 8 Korean speakers of GAE and SSBE, consisted of 448 English words which contained 14 vowels in the *b_t* context (e.g., *beat, bot, boot*). The learners gave an identification response from given14 response words. The results indicated that the learners' responses reflected their experience with their target dialect as the Korean EFL and ESL-US learners identified GAE vowels more accurately than SSBE vowels while the ESL-UK learners' identification of GAE vowels was comparable to that of SSBE vowels. Specifically, the results revealed that the ESL-UK learners showed benefits for some SSBE vowels like /ɜ/ (*Burt*) and /ɒ/ (*bot*) while the EFL and ESL-US learners had more difficulty identifying these SSBE vowels relative to other SSBE vowels, thus showing vowel category variation in addition to the impact of target dialects on L2 vowel perception. The results from the ESL-UK learners further indicated that their ability to perceive GAE vowels didn't deteriorate after their intensive exposure to SSBE. However, talker effects were not found for any of the learner groups irrespective of their target dialect. The overall results are further discussed in terms of interlanguage, the relationship between L1 and L2 vowel categories, and phonetic/acoustic properties of L2 vowels in target dialects, along with the implications of the findings of the present study for L2 speech models (Flege, 1995).

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Exploring characteristics of speech sound disorders in Mandarin-English bilingual children in New Zealand

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The main challenge for clinicians working with bilingual children referred for suspected speech sound disorders (SSD) is distinguishing language difference from actual disorder. In order to accurately assess and differentially diagnose a bilingual child, clinicians need information on typical phonological development for the child's specific language pairing as well as studies on bilingual children with SSD. Current research in both these areas is limited and primarily focused on pairings such as English-Spanish (Fabiano-Smith & Goldstein, 2010; Goldstein et al., 2005; Gildersleeve-Neumann et al., 2008), English-French (Brulard & Carr, 2003), English-Italian (Holm & Dodd, 1999; Bortolini & Leonard, 1991), English-Cantonese (Dodd et al., 1997; Holm & Dodd, 1999).

In this presentation we add to the research with a language pairing not previously investigated. Our focus is on a detailed analysis of three school aged Mandarin-English bilingual children with SSD. The children were assessed in both languages using the DEAP (Dodd et al., 2002) phonology assessment and a Mandarin speech sound assessment (Hua, 2002). Results on their phonetic inventories, phonetic accuracy and speech error patterns in both languages were compared with those found for similarly aged typically developing peers from a sample of 300 Mandarin-English bilingual children. Comparisons reveal both distinct and subtle differences between these bilingual children with SSD and their typically developing peers; these include reduced phonetic accuracy, the presence of error patterns not evident in the typical data, and delayed resolution of typical error patterns. We conclude with a discussion of the characteristics and potential diagnostic markers for SSD for this population.

Keywords: Mandarin, bilingual, child speech, speech sound disorders

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Phonological development of successive Mandarin-English bilingual children in New Zealand

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There is currently limited research on the phonological development of successive bilingual children, and little is known about their developmental trajectory or the interaction between their languages (Genesee et al., 2004; Fabiano-Smith & Goldstein, 2010; Goldstein et al., 2005).

In this presentation we report on the development of 300 typically developing successive bilinguals (5-8 years) growing up in New Zealand. The participants speak Mandarin and English; a language pairing where there has to date been no research on such a large scale. Following Dodd et al. (2003) standardised single word assessments were used, the phonetic inventories and error patterns of the participants were then collected and analysed. Results indicate that these children differ from monolingual peers in both languages. For the 5 and 6 year olds, inventories are generally smaller than those reported for either monolingual English (Dodd et al., 2003) or Mandarin (Hua, 2002). However, any differences between bilinguals and monolinguals are largely levelled by the eighth year. Bilinguals also differ to monolinguals in regard to the errors produced. Some error patterns typical for monolinguals (e.g., gliding in English, and fronting in Mandarin), occur in greater frequency. Others (e.g., simplification of consonants in Mandarin and devoicing of plosives in English) are not found in monolingual development and are distinct to these bilinguals. Both quantitative and qualitative differences seem to suggest that growing up in a country where the mainstream language differs from the home language has an impact on phonological development. In line with previous research this may be attributed to interaction between the languages (Hua & Dodd, 2006; Fabiano-Smith & Goldstein, 2010; Goldstein & Bunta, 2011). We conclude with a discussion of how other factors such as dialect of Mandarin may play a role in these children's phonological acquisition.

Keywords: Mandarin, bilingual, child speech development, typical speech development

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Crosslinguistic influence in L3 production of the French vowel /i/ by L3 Mandarin speakers and dialectal effects

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The current study sought to identify the source language for crosslinguistic influence in the production of the French vowel /i/ by Mandarin-speaking learners by addressing the following research question: How will their L1 Mandarin and L2 English influence the production of French /i/, a vowel that exists in both their L1 and L2? Based on previous L3 production studies, the main source of crosslinguistic influence is predicted to come from the previously acquired language that is typologically the most similar to the target language (Wrembel, 2010; Llama, Cardoso, & Collins, 2010) or learners' native language (e.g., Llisterri & Poch, 1987; Díaz Collazos & Pascual y Cabo, 2011). Since there has been insufficient research to predict which factor is more influential, two possible outcomes exist: i) typology would be more influential, such that the learners' L2 English would be favoured as the source language (SL); or ii) their L1 would override typology and the learners' L1 Mandarin would be favoured as the SL. To test the hypothesis, 11 female Mandarin-speaking university students who had been living in Canada for an average of 10 years were recruited. To measure their oral proficiency in French and English, the present study used an accentedness rating task in which the participants read aloud the short story *The Northwind and the Sun*/*La bise et le soleil* (e.g., Bongaerts, 1999). The experimental task involved carrier-sentence reading in each of the three languages, which allowed for L1-L2-L3 acoustic comparison of the target vowel. Participants' readings were recorded digitally and target words were extracted. For each word, an acoustic analysis of the formant structure (F1, F2, F3) was performed using *Praat* and mean formant values were calculated for all participants in their three languages. The results revealed that for the majority (ten) of the participants, their L1 Mandarin, despite being typologically distant from the target language, was the source language for crosslinguistic influence – the participants' productions of /i/ in French and in English were variations of their /i/ in Mandarin, which suggest that learners of a nonnative language tend to maintain phonological characteristics of their L1 (e.g., Llisterri & Poch, 1987). In contrast, one participant's French [i] was very distinct from that of her Mandarin and English and thus showed no L1 and L2 influence. An acoustic analysis revealed that this particular participant, who had spent the previous summer in Québec, had realized target /i/ as lax [ɪ] in closed syllables. Given the [i]-[ɪ] allophonic alternation observed in QF, the results seem to suggest that dialectal differences may lead to variability in the production of the same vowel phoneme by speakers with the same L1 and L2.

Keywords: crosslinguistic influence, L3 production, French, Mandarin, English, dialectal differences

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Phonological development of Mandarin-speaking children: A systematic review

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Standard Chinese, which is also called Mandarin, has become the most popular language in the world with more than 1.9 billion speakers worldwide (Lewis et al., 2015). It is spoken in the People's Republic of China, the Republic of China (Taiwan), Singapore and other parts of Southeast Asia. There are also communities of Mandarin Chinese speakers in many other parts of the world. Yet, there is a dearth of research on the speech acquisition in Mandarin when compared to the extensive data bank in English. There is a small number of longitudinal studies carried out in US and Taiwan on general speech and language development in Mandarin-speaking children before 1990s. However, not many research findings are published in easily accessible means and are mostly written in Chinese. The main purpose of the study is to systematically review empirical studies that aimed at reporting the speech development in children who speak Mandarin Chinese as the native language and without concerns of developmental disorders including speech sound disorders. To conduct a thorough search, in addition to the major electronic databases (Academic Search Premier, Education Full Text, ERIC, Linguistic and Language Behavior Abstracts, PsycINFO, and Web of Science), relevant studies are located by citation searching, physical searching in library resources, and searching relevant internet resources in Mainland China. Relevant studies published between 1980 and 2014 are reviewed with reference to (1) research design (e.g., sample size, participants' characteristics, cross-sectional or longitudinal), (2) the outcome measures (e.g., phonemes or lexical tones acquired, phonological patterns), (3) geographic districts in China, and (4) the transcription systems employed (e.g., Pinyin or IPA systems). The results of the review can pave the way for future studies on speech development in Mandarin-speaking children.

Keywords: Mandarin, Chinese, speech sound development, age of acquisition, phonological patterns

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Exploring the voice onset time of Spanish learners of Mandarin

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Voice onset time (VOT) has been examined across languages by plenty of studies (Flege, 1987, 1991, 1999; Hu, 2012) especially during the process of acquisition. More specifically, the Speech Learning Model (SLM) posits that the performance of the L1 in VOT might be influenced by the acquisition of the L2 (Flege, 1987, 1995, 1999, 2002). Thus, the Mandarin/Spanish stops produced and perceived by those Spanish-Mandarin learners is of the interest. Our study aims to investigate if Spanish learners acquire the way to perceive and produce the aspirated/un-aspirated stops in Mandarin after several months of learning. 15 Spanish natives (mean age=24; 9 females and 6 males) participated in the 4 perception (2 Spanish and 2 Mandarin) and 3 production (2 Spanish and 1 Mandarin) experiments with an interval of three to four months.

A univariate (one way ANOVA) and an ANCOVA test were performed to examine the 1st and 2nd results by means of correct rate (perception) and their mean VOT values (production). The results showed "Vowel" and "Place of Articulation" play important roles, and most of these Spanish-Mandarin learners made significant progress after several months of immersion in a Mandarin society. That the adjacent high/low vowels affect our subjects' perceptual discrimination can be explained by the vocal-fold tension of the high vowel /i/ (Higgins et al., 1988; Cheng, 2013). The alveolar stop is best discriminated because of its most salience (Miller & Nicely, 1995). In conclusion, when learning a foreign language, the environment in which L2 learners stay would influence their L2 progression. The characteristic of the preceding vowels and the nature of the stops could also be significant in the acquisition of aspiration/unaspiration stops.

Keywords: Voice onset time (VOT), perception, production

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On the permeability of German-Spanish bilinguals' phonological grammars

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Data on the development of seven German-Spanish simultaneous bilingual children's phonological grammars will be the topic of this presentation. The children, growing up in Germany, were exposed to the two languages from birth, under similar conditions: the mothers, who in the first years were the main caretaker, were native speakers of Standard Peninsular Spanish (4), Mexican Spanish (2), and Chilean Spanish (1); the fathers were native speakers of Northern German. All children but one began attending a kindergarten at 3;0. The domains observed present phonological differences between German and Spanish. The hypotheses considered are based on Paradis & Genesee (1996)'s predictions. Here, we will report on results in Spanish, where we have found: acceleration (syllabic codas), a slight delay (VOT, unfooted syllables), transfer (spirants, Place assimilated nasals), as well as a different order of acquisition (depending on types of prosodic words). Data by German-Spanish bilingual children growing up in Madrid were drawn for comparison. There, we found acceleration (codas), but no transfer (spirants, assimilated nasals).

The observed effects cannot be explained on the basis of interfaces because all phenomena analyzed involve various interfaces, and should be affected in a similar way. They cannot be explained by (in)balance, either, as they may appear both, in a balanced as well as a non-balanced condition. It is proposed that Optimality Theory offers the most explanatory analysis of the results: According to such analysis, markedness constraints are dominant at first, and are demoted soon thereafter due to frequent violations. The acceleration found in the bilinguals' coda production is thus due to the frequent violations of the NOCODA constraint that the child experiences in target German, i.e. due to the joint additive effect of the two languages. Transfer, on the other hand, is due to the outranking position that German attributes to the UNIFORMITY constraint, which prevents lexical items from alternating, the basic difference between the two languages being that German is demarcative and Spanish is a grouping language.

Keywords: bilingual acquisition, syllabic codas, constraints, markedness, Optimality Theory, grammatical permeability, spirantization.

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The phonetics of the phonological feature of voicing in accurate and inaccurate aphasic production[1]

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As argued by Lindblom (1990), speakers' control over the information in the speech signal is motivated by the need to convey sufficient contrast, necessary for successful lexical retrieval by the listener. In this paper, we wish to examine these efforts in patients with a speech motor control deficit, especially concerning the temporal synchronization of glottal and supra-glottal articulators required for the production of the VOT. This deficit, typically encountered in Broca's aphasia, is traditionally opposed to a phonological impairment exhibited by conduction aphasic patients.

In order to do so, we analyze the acoustic expression of the feature of voicing in Spanish and the trade-off relationships between acoustic parameters hypothesized to contribute to the perception of voicing, in both accurate and inaccurate aphasic speech.

In particular, we are interested in whether different acoustic parameters enter into a positive (synergistic) or negative (compensatory) relationship to achieve phonological contrast of voicing, and in the effects of pathology (Broca's aphasia, conduction aphasia and normal speakers), frequency (lexical, syllabic and phonemic), stress (stressed and unstressed syllables) and accuracy (voiced vs devoiced productions) on these interactions.

The results are interpreted in the light of the underlying nature of linguistic deficit in two types of aphasia and in relation to the hypothesis advanced by Baqué et al. (2015) about compensatory strategies at the phonic level observable in Broca's aphasia. With respect to frequency effects, the results are discussed in relation to the storage vs computation continuum as implemented in Levelt's model of speech production (Levelt & Wheeldon, 1994).

Keywords: aphasia, motor control, compensation in aphasia, phonetics, voicing

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A comparative prosodic study of the Italian language in Italian and Slovenian news

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It is known that languages that are spoken at or near the borders of different countries may show language contact effects. Little is known of how the varieties of Italian spoken outside the borders of Italy may show the influence of other languages. In Slovenia, as a result of the particular language contact situation, speakers use and are exposed to a variety of languages, including Italian, Slovenian and Croatian. It is thus highly likely that the variety of Italian spoken by the Italian National Community (INC) in Slovenia has unique characteristics reflecting the influence of Slovenian. To test this hypothesis, in this research we analyze the Italian variety spoken on *TVKoper*/ *Telecapodistria*'s newscast, a program produced in the Slovenian city of *Koper*, broadcasted to the Italian speaking minorities of both Slovenia (Litorale-Carso) and Croatia (Istria). This paper focuses on prosody and makes reference to previous research on the prosody of the Italian language used in TV news (e.g., Giannini & Pettorino, 2010; Giannini, 2004; Pettorino, 2002, 2003; Palumbieri, 2003). The study addresses the following questions: (i) Are there differences in articulation rate, speech rate, pitch range, silent and respiratory pauses between the news produced in Italy and that produced in Slovenia (INC)? (ii) Do INC features show distinct prosodic features that can be interpreted as due to a Slavic i.e. Slovenian influence?

The corpus consists of broadcast news copies produced by a) four journalists of the studio *TG RAI* (Italian Television), and by (b) four journalists of the studio of *TG TvKoper / Koper* (Slovenia); all of the eight speakers were male. For each of the speakers 90 seconds were recorded and subsequently transcribed. An acoustic analysis of the data was carried out with the open source acoustic analysis software package *Praat*.

The preliminary results show that there are significant prosodic differences between the Italian-speaking newscasts produced by *TG RAI* in Italy and those produced by *TVKoper* in Koper, Slovenia; the Italian data extracted from the broadcast news copies by *TvKoper* presents substantially lower mean duration of consonants and vowels, greater fluency, articulation rate and speech rate. The Italian *TG* data is more vocalic than that of *TvKoper* and is furthermore characterized by a frequent use of epenthesis, that is almost absent in *TvKoper*. Both of these differences - the lower vocalism and the lower occurrence of epenthesis - might be explained as due to the effect of Slovenian.

Keywords: prosody, language in newscasts, language contact, Italian, Slovenia

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Third language acquisition: An experimental study of the pro-drop-parameter

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The purpose of this presentation is to investigate the acquisition of German as a third language (L3) of adults with Greek as mother tongue (L1), whose first foreign language is English (L2). The dominant topic of discussion of the theoretical and experimental approaches on the *L3 Acquisition* (L3A) determines the source of linguistic transfer of syntactic structures and functional categories in the interlanguage of non-native speakers (NNS) in the L3A. Since the NNS already know two languages, the source of linguistic transfer cannot be determined unless the studied syntactic phenomenon and parameter are differently valued at L1 and L2 and L3 is similar to or different from one of the two.

In this case we investigated the *Pro-Drop-Parameter*, a parameter in which Greek and English are differently valued. Greek is a *Null Subject Language* and English is *Non-Null Subject Language*. This, among other properties on the surface structure of language, means that in Greek a pronoun does not necessarily have to be realized in subject position thus overt grammatical subjects may be omitted (eg both *ego pezo* and *Ø pezo* are correct), while in English the pronominal subject must always be explicitly implemented in order to constitute a grammatically correct sentence (eg *I play* but not * *Ø play)*. German is classified by many researchers as a Non-Null Subject Language because in most cases German does not allow the omission of the overt grammatical subject (eg *ich spiele* but not * *Ø spiele)*. In fact, also in German there are some instances, where omission of the overt grammatical subject is permitted, therefore current theoretical approaches classify German among *Expletive Null Subject Languages.* The cases where the overt grammatical subject can be omitted also in the German language are identified in the Passive Voice of specific verb classes. Therefore, it is obvious that the Pro-Drop-Parameter in German is realized in some cases, as in English and in others as in Greek. For this reason, this parameter was chosen to be studied.

In order to investigate the interlanguage of NNS an experimental study, consisting of two tasks, a Grammaticality Judgement Task and a Preference Task, was conducted. These tasks have measured the judgments and preferences respectively of three groups of participants. Two groups consisted of NNS with different level proficiency in German, but the same in English and the third group consisted of native speakers of German and served as control group.

The results of both experimental tasks show that none of the languages the NNS already known seem to play a more significant role than the other in shaping their interlanguage in both proficiency levels in German. Both languages seem to be equally important and available in order to provide an appropriate linguistic representation of the target - language at any given time. According to these data it seems that the model, which best describes the interlanguage of the NNS is that of Flynn, Foley, & Vinnitskaya (2004), namely, the *Cumulative-Enhancement Model for Language Acquisition*. According to this model it can be either only "positive language transfer" or no linguistic transfer at all of the languages already acquired by the NNS in their target L3.

Keywords: third language acquisition, pro-drop-parameter, interlanguage

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Vowel reduction in early Spanish-English bilinguals: How native is it?

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The prominent view in research suggests that early bilinguals are more likely to achieve a native-like fluency in their second language than late bilinguals or adult second language learners (Birdsong, 2014). Some propose that the early bilinguals who learn their second language before the age of puberty will sound like monolingual speakers (Hoffman, 1991). With regard to the overall agreement that early bilingual learners are more apt to learn native-like fluency, this study acoustically analyzed the production of reduced vowels in unstressed syllables of English produced by Early Spanish-English bilinguals. The aim of the study was to investigate whether or not the duration and formant values of the vowel were comparable to that of native monolingual English speakers or if the Spanish-English bilinguals produced a reduced vowel that is longer than the norm of native English speakers despite having learned English at an early age. Frequency was also taken into account to determine whether or not the qualities of the reduced vowel were closer to the monolingual production in the more frequent words.

Two groups of participants from South Florida were included; forty monolingual English speakers and forty early Spanish-English bilinguals (age of acquisition before 9). The monolingual English group was used as a control in order to measure the amount of deviation from the bilingual group. Participants were asked to read twenty English sentences containing a target word with a schwa. The schwas occurred in two different prosodic environments, a pre-primary and post-secondary environment and a post-primary and pre-secondary environment.

Using PRAAT Speech Analyzer, the duration of the reduced vowels were measured. The first and second formants of the vowels were taken at the midpoint of each occurrence of the vowel. Statistical analyses were conducted on the data in SPSS in order to determine the relationship between the duration of the schwa, the language group (monolingual and bilingual), the prosodic environment and frequency. Separate analyses were performed in order to determine the relationship between the language group and formant 1 and 2 of the vowels in each prosodic environment.

The results indicate that there is in fact a statistically significant difference in the duration of the reduced vowels in that Spanish-English bilinguals produce a longer schwa than Monolingual English speakers. The prosodic environment and the frequency of the word were found to contribute to the duration of the vowel as well. Significant differences were also found between the two groups of speakers in relation to the formant values. These results suggest that although Spanish-English bilinguals may be perceived as native speakers in their second language, there are significant differences found in their production of reduced vowels when measured acoustically.

Keywords: bilingualism, vowel reduction, prosodic environment, frequency

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Non-native listeners' speech processing benefits for accented speech

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Previous research suggests that properties of the speech signal (noise, talkers' L1 and accent) as well as listeners' characteristics (L1 background, L2 accent, L2 proficiency level or experience with L2-accented speech) contribute to the intelligibility of non-native speech (Munro & Derwing, 1995). However, this research has mainly focused on accuracy measures of intelligibility aiming at assessing the extent to which non-native speech is understood by native and non-native listeners, rather than the extent to which such speech- or listener-based factors impair the processing of L2 speech. Some studies have shown that a foreign accent slows down the processing of spoken sentences by native listeners (Clarke & Garrett, 2004), as does the presence of a regional accent (Goslin et al., 2012), and native listeners familiar with a given L2 accent have been shown to exhibit faster and more efficient processing for speech in that accent than for speech in an unfamiliar accent (Floccia et al., 2006). But the processing delays associated with non-native listeners' characteristics or the presence of a foreign accent in speech are under-researched. Such processing delays might be reflecting actual difficulty in understanding an utterance, as opposed to listeners' *perception of difficulty in understanding an utterance*, commonly referred to as *comprehensibility*. In the present study we assessed the extent to which non-native listeners' speech processing delays during L2 comprehension were associated with their L2 proficiency as well as the presence of an unfamiliar foreign accent in the speech signal. We also assessed the extent to which such delays were associated with L2 listeners' perception of degree of difficulty in understanding (*comprehensibility*) and degree of perceived foreign accent. Measures of speed of processing for words in an animacy judgement task and for sentences in a sentence verification task (response latencies in milliseconds) were obtained from L1-English listeners (n=10) and from L2-English listeners differing in L1 background, Catalan (n=20) or German (n=20), either matching or not matching the talkers' L1, and in L2-English proficiency (High vs. Low). The results showed that non-native English was faster to process for non-native than for native listeners as long as listeners' and talkers' L1 matched and the proficiency level of the listener was high. L1-Catalan and L1-German listeners processed English produced in their own accent faster than English produced by L1-English talkers as long as their L2 proficiency level was low. Listeners' L1 and Proficiency were related to accentedness ratings in a way different from the way they were related to comprehensibility ratings and both comprehensibility and accentedness were strongly related to speed of processing, sentences obtaining lower processing times being perceived as having a lower degree of foreign accent and being easier to understand than sentences obtaining higher processing times.

Keywords: comprehensibility, foreign accent, speech processing

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Phonological development in Spanish learning children with cochlear implants

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Research on language acquisition in early implanted children has provided robust evidence of the benefits of these devices (e.g., Geers et al., 2009). However, the precise extent to which the developmental process and the long-term language use of these children is fully debatable. Thus, while it seems that some children do progress very rapidly (so called star children; Pisoni & Cleary, 2002) studies examining in detail the characteristics of these children have found evidence of atypical development, particularly in productive phonology but also in other language areas (e.g., lexicon and grammar). This suggests that phonological development may be a crucial keystone to explain the long-term outcomes of these children.

This study obtained data on the phonological segment skills of a group of 14 Spanish speaking CI children and a group of typically developing (TD) children. The CI children had been implanted between 12 and 20 months of age (M=17). The groups were matched based on the score in a sentence imitation task (Moreno-Torres, Madrid-Cánovas, & Moruno-López, 2013). The auditory age of the CI children ranged between 21 and 48 months (M=38). The chronological age of the TD children ranged between 26 and 34 months (M=32). The same sentence imitation task was used to explore the phonological skills of the participants. For each child, we obtained a narrow phonological transcription, and we selected the first 100 consonants which were part of intelligible words. Based on that database we analysed the phonological errors in each group.

At the segment-level, the two groups were notably similar (i.e. no statistical difference); however, the errors in the CI children were more variable and less predictable than those of the TD group. At the suprasegmental level, the CI children produced significantly more errors than the controls (e.g., syllable structure modifications, metatheses, assimilations…). Also the CI children produced more non-intelligible productions than the controls.

The results are interpreted according to a neurolinguistic model of phonological development (Hickok & Poeppel, 2004, 2007; Moreno-Torres & Moruno-López, 2014). We propose that while the apparent outcomes of many CI children are very close to typical, the processing skills of these children are clearly atypical, which is most possibly due to the fact that their hearing devices provide only a small subset of the acoustic information encoded by the linguistic messages.

Keywords: phonological development, Spanish language cochlear implants

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Bilingual language and speech patterns: Evidence from English (L1) & Greek (L2)

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The connection between speech and language skills among bilingual children has been relatively under-researched. The aim of the present study is to investigate aspects of language and speech patterns of bilinguals who learn both English (L1) and Greek (L2). The participants were thirteen bilinguals (8 boys, 5 girls), from the Greek - American community in the United States, following grades 3 to 6. Their instruction in Greek ranged from 2 to 6 years. All of them reported speaking both languages at home.

Children's retelling on the 'Frog where are you' story (Mayer, 1969) was used to extract a sample of words for analyzing patterns of speech errors, and derive percentages of vowels (PVC), consonants (PCC) and phonemes correct (PPC). Using the Systematic Analysis of Language Transcripts (SALT) (Miller & Iglesias, 2003-4), mean length of utterance (MLU), fluency (words per minute), expressive vocabulary (number of different words) and narrative structure (NSS) have been calculated in both languages. In addition, phonological awareness and vocabulary measures were administered in both L1 and L2.

The analysis of speech errors indicated consistency across children as regards cluster reduction, syllable reduction in multisyllabic words, and vowel reduction. L2 measures were interrelated, as well as L2 PVC and PPC with L1 phonological awareness. However, between languages comparisons indicated that there is no significant difference in L1 & L2 phonological awareness. The results indicate that language transfer may carry valuable information for the identification of bilingual children with speech and language difficulties.

Keywords: bilingual speech, speech and language, phonological transfer

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Communicative competence in TD bilingualism and bilingual SLI - A twin case study

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It is the aim of this presentation to introduce the first results of an ongoing longitudinal twin case study, in which the linguistic development of a typically developing English-Polish boy (TDB) and his twin brother, who had previously been diagnosed with SLI (LIB), are compared. It is the goal of this study to go beyond a description of isolated linguistic features and to depict the subjects' communicative competence (Hymes, 1966; Canale & Swain, 1980). This intention originates in new findings which suggest that children with language impairment may also struggle with the social aspect of communication (e.g., Adams et al., 2012; Chiat & Roy 2013; Conti-Ramsden et al., 2006). This has lead researchers like Bishop (2000) to question an independent diagnosis of pragmatic language impairment and to re-evaluate the traditionally sharp boundaries between autism and SLI (Bishop, 2003). In pursuit of providing a more holistic account of typically and atypically developing bilingual communicative competence, a combinatory design of formal tests and spontaneous speech data, covering all four areas of communicative competence (linguistic, sociolinguistic, discourse and strategic), was developed and administered to the subjects aged 4;8, 4;10, 5;6, 6;10, 7;7 and 7;11. A first analysis of the spontaneous speech samples reveals that TDB initiates more conversations and introduces a wider range of topics than LIB, who also produces a significantly higher number of one or two-word utterances. It further becomes obvious that LIB has bigger difficulties to follow a thread of conversation over a larger number of turns and is more reluctant to speak his family language, Polish, despite being encouraged to do so. Additionally, diverging strategic competence could be observed. While TDB's communication strategies were more listener-focused and thus more successful, LIB used a higher number of code-switches in monolingual settings and often misinterpreted personal knowledge as factual. This lack of distinction between own and shared knowledge is also evident in the Theory of Mind tasks. This study hence coincides with recent work in the field of (bilingual) SLI and suggests that language problems in this population may not restricted to the linguistic domain but equally affect discourse, sociolinguistic and strategic competence.

Keywords: bilingualism, SLI, communicative competence, social communication

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Language use and language attitudes among bilingual nursing home residents

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The study to which this abstract refers is, at the time of abstract preparation, still ongoing. Data collection is scheduled to finish on February 28th, 2015. This qualitative, observational study uses low-involvement participant observation and informal interviews to investigate language use among bilingual nursing home residents in Ireland, whose first and second languages are Irish and English, respectively. The primary participants (nursing home residents) all show clear episodic memory deficits, consistent with mild-to-moderate dementia, although not all have a clinical diagnosis of dementia. Secondary participants are staff employed at the nursing home, most of whom also have at least a working knowledge of the residents' first language, Irish.

This presentation will focus on the following research questions: What are the language use and language preference patterns of Irish-English bilinguals residential care for the elderly? How do residents and others (e.g., care staff) value their languages?

Because the study is still ongoing, only tentative conclusions can be drawn at this point. However, the following patterns are emerging: This nursing home is a deliberately (on the part of both staff and management, and residents) bilingual environment, and systematic code-switching is employed to counteract potential feelings of exclusion or isolation on the part of residents. Residents express positive attitudes towards their L1 in a variety of ways, ranging from responding in Irish to Irish conversations initiated by the researcher, to meta-comments about language, accents, and appraisal of language and speech (for example when teasing staff members in a good-natured fashion for less-than-fluent attempts at Irish). Participants also value finding themselves in the role of the expert and teacher, and of the more competent and fluent speaker (as compared to some staff members, and the researcher). In addition, residents code-switch systematically to maintain smooth communication in the face of language barriers, for instance when translating for less-than-fluent staff members.

The findings of this study have potentially important implications for the social and communicative well-being of bilingual elders in residential care. Active and deliberate use of both languages can have a positive effect on participation and thus reduce social isolation. A communicative environment that encourages functional code-switching also encourages recourse to a bilingual's cognitive resources, and furthermore casts the bilingual elder in the role of expert, which in turn contributes to the maintenance of a positive identity.

Keywords: bilingual ageing, dementia, language attitudes, Irish

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Rhotic phonemes in modern standard Welsh: The effect of Welsh-English bilingualism?

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Descriptions of the phonology of Modern Standard Welsh (e.g., Jones, 1984) usually posit the existence of two rhotics, /r/ and /r̥ʰ/. This is also reflected in the orthography, where <r> and <rh> are deemed separate letters. However, it is not easy to show that these two phonological units are in fact contrastive. In word final position only /r/ can occur; in word initial position only /r̥ʰ/ can occur (though see below). Word medially /r/ occurs except in cases of certain prefixes added to /r̥ʰ/ initial roots; but no minimal pairs have been identified by the authors.

However, these restrictions are affected by initial consonant mutation. Welsh demonstrates sets of phonological changes to word initial sounds triggered by specific morphosyntactic contexts. These are termed 'initial consonant mutations' (Ball & Müller, 1992). One of these sets of changes is 'soft mutation'. Here voiceless plosives are voiced, voiced plosives are spirantized, /m/ changes to /v/, and the liquids (/r̥ʰ/ and /ɬ/) are voiced becoming /r/ and /l/.

The operation of soft mutation, therefore, results in words beginning with /r/ (but only when in the relevant morphosyntactic contexts that trigger the mutation on /r̥ʰ/), and which now contrast with the same words when not in the relevant morphosyntactic contexts. Such contrastivity is, of course, notably different from what is normally considered as contrast in phonology. Thus, word-initial /r/ is a *reflex* of /r̥ʰ/ in soft mutation contexts. All other soft mutation reflexes also have independent phonemic status verifiable through traditional minimal pair tests (albeit with some structural restrictions). The reason that both /r/ and /r̥ʰ/ have separate orthographic representation historically, then, is partly at least through analogy with other soft mutation reflexes. (Interestingly, the nasal mutation reflexes of fortis plosives are not treated as separate letters in the orthography, presumably because these sequences do not occur independently of the nasal mutation.)

In the modern language the situation has become more complicated. The fact that nearly all Welsh speakers are also speakers of English has led to a number of lexical borrowings from English into Welsh. Some of these are /r/-initial words (e.g., *racŵn* 'racoon'; *rownd* 'round'; *rygbi* 'rugby'); many are also found with initial /r̥ʰ/ (e.g., *ruban, rhuban* 'ribbon').

We argue here that a theoretical framework is needed that can account for the phonological, morphological, and syntactic aspects of the /r̥ʰ/ - /r/ distinction, the difference in distribution of the sounds in different syllabic positions, and the effect of borrowings. Therefore, this presentation will describe an analysis using Systemic Phonology (e.g., Tench, 1992; Bowcher & Smith, forthcoming). Systemic phonology allows polysystemic accounts (thus permitting a different phonological status to sounds at different places in structure and for different lexical types).

Keywords: Welsh, English, bilingualism, lexical borrowing, phonology, rhotics

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A developmental study of self-repairs in Spanish normal-speaking children and comparison with a case study of specific language impairment (SLI)

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Disfluencies are a common trait of every-day speech, self-repairs being the most common example of breaks of the speech flow (MacLurg, 2014). According to Levy (1999), the complexity of self-repairs cannot just be explained in terms of the monitor but also in terms of the metalinguistic function. The aim of the present study is two-fold. On one hand, we intend to provide developmental data on self-corrections. This information will facilitate assigning a developmental age to children acquiring their first language and will be used subsequently for screening purposes among SLI populations. The data on normal-speaking children (control group) were obtained through a cross-sectional study. Forty normal-speaking children whose ages ranged from 22 months to 10 years were audio- and video-recorded during a 45-minute semi-structured interview and subsequently transcribed using the SALT system (Systematic Analysis of Language Transcript). The language samples were categorized by the first author. Two additional transcribers categorized 10% of the language sample. Cohen's kappa coefficient showed a high inter-rate agreement (k=0.87 and k=0.90) indicating that the categorization of the language categories was reliable.

Specific language impairment (SLI) is a language disorder characterized by an alteration of normal language development of receptive and productive skills. It may affect one or more linguistic levels. The causes of this disorder have not been clearly established so far. The SLI longitudinal data were obtained from a SLI child who was recorded at 10 developmental times during the life span of 3;4 to 6;0. The child's linguistic profile was compared with the data from the normal-speaking children.

The results of the normal-speaking group showed that the first self-repairs primarily affected the phonological level and emerged around 1;10 years. Each linguistic level related with self-repairs includes U-shaped reorganizations (Bowerman, 1982), although these do not appear simultaneously at all linguistic levels. Pragmatic self-repairs are the most commonly used by normal-speaking children and the appear around 1;10 years, just like syntactic self-repairs. As for the SLI child, the first self-repairs emerge at 4;3 years and they affect morphology and syntax (4;10 years). The frequency of self-repairs is considerably lower in the SLI child relative to the control group and it increases as a function of age. It is hypothesized that an improvement of linguistic competence goes hand in hand with metalinguistic abilities, which leads the SLI child to self-correct his/her deficiencies. This finding is in line with Berthood's proposal (2000) of language development and metalinguistic function.

Keywords: SLI, self-repairs, metalinguistic abilities

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Vowel duration contrast in three long-short pairs by Hungarian 5-, 6-, and 7-year-olds

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Phonemic use of vowel duration differs across languages, ranging from no functional vowel length discrimination (e.g., Spanish), to duration used only as an acoustic cue but not a phonological feature (as in English), to vowel duration used as both an acoustic cue and a phonological feature (such as Hungarian). Studies on Hungarian vowel duration indicate that some overlap exists between long and short vowels due to factors such as tempo, word length (Gósy & Beke, 2010). Vowel length in Hungarian is one of the last contrastive vowel features to be acquired, and one to undergo gradual development starting with certain pairs (e.g., /i/ - /i:/) around 4 years of age (Zajdó & Powell, 2008), but still not completely mastered in all 7 long-short vowel pairs by 6 years of age (Bóna & Imre, 2010; Deme, 2012). Our study investigates vowel length differentiation in 3 pairs of vowels that only differ in duration (/i, i:, o, o:, u, u:/) between the ages of 5;0 and 7;11. We hypothesize that there will be a trend toward greater vowel length differentiation as children age. Also, both vowel duration and quality are expected to display effects.

Participants (n=30) included 3 groups of monolingual Hungarian-speaking children: 5-, 6-, and 7-year-olds from Hungarian public schools. The participants had typical cognitive skills, speech, language, and hearing within normal limits per parent and teacher report. Audio recordings were collected via conversational samples as the children interacted with a researcher, discussing favorite pastimes and everyday lives. Vowels were analyzed using Praat except final vowels and distorted productions or substitutions (e.g., excessively long exemplars when the participant hesitated or vowels produced in error).

A mixed ANOVA with age as a between-subjects factor (5-, 6-, and 7-year-olds), vowel length (long – short) and vowel quality ([i, i:], [o, o:], and [u, u:]) as within-subjects factors, and duration measurement as the dependent variable revealed statistically significant effects for vowel quality [$F(2, 42)=10.49$; $p<0.001$; partial $\eta^2=0.33$], vowel length [$F(1, 21)=67.49$; $p<0.001$; partial $\eta^2=0.76$], but no age effect or age by length interaction. Our predictions for differences based on vowel length and quality were supported; however, the lack of age and age by length interaction effects did not support our hypothesis. Overall, Hungarian children do differentiate vowel durations based on phonemic length and vowel quality, but differentiation may occur as early as 5 years of age. Further research should include more participants, more vowel pairs and have more control for other variables to have more robust and reliable findings.

Keywords: vowel, duration, phonemic length, children speech

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When carte blanche becomes blanche carte: Cross-linguistic influence in French-English and Welsh-English bilingual children

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Bilingual children sometimes produce constructions with cross-linguistic influence (CLI), that is, with influence of the non-target language. CLI has been observed at all levels of linguistic description, from phonology to idioms. One possible explanation of CLI is that it is a processing phenomenon (Nicoladis, 2006). In speech production, when languages share constructions at the lemma level, the interference between the two languages could result in CLI. For example, Spanish possessive constructions are periphrastic (e.g., la mano de mami 'the hand of Mommy'). In English, the periphrastic construction is allowed but possessive constructions with –'s are preferred. A Spanish-English bilingual might experience interference in producing these in both languages, resulting in reversals in both languages.

The present study is designed to test a prediction generated from the processing framework approach. If bilinguals have multiple options within a language, they should produce more CLI in that language than bilinguals with only one option within a language. Since the within-language constructions would compete, the result would be more CLI among bilinguals with multiple within-language constructions than among bilinguals with only a single construction.

Predicative adjective-noun constructions were elicited from French-English (Nicoladis, 2006) and Welsh-English bilinguals (Nicoladis & Gavrila, 2015). In English, predicative adjectives are typically prenominal. In both French and Welsh, predicative adjectives typically appear postnominally, although there are more exceptions to that general rule in French than in Welsh. Adjectives that appear prenominally in French are often high frequency and acquired early (e.g., "petit" 'little'). Since French allows for two options of adjective placement and Welsh only one, the French-English bilinguals should produce more reversals in French than the Welsh-English bilinguals in Welsh.

Children between three and five years were included in this study. They were asked to describe one item among others with a distinctive feature (e.g., a little ring out of an array of rings). Predicative adjectives are often produced to distinguish one item from others. The Welsh-English bilingual children were living in Wales. The French-English bilingual children were living in Canada. The children within the two bilingual groups were matched on age. To operationalize CLI, the dependent variable was the percentage of reversed adjective-noun constructions out of the total number of adjective-noun constructions produced. In French, only adjectives that typically appear postnominally were included in the analyses.

The results showed that there were no differences in their percentage of reversals in English. However, the percentage of reversals in French was higher than in Welsh. These results are consistent with the argument that CLI is affected by within-language competition at the lemma level in speech production.

Keywords: bilingual speech, cross-linguistic influence, bilingual first language acquisition, interference, speech production

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L2 sound perception and production: Does orthography matter?

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In recent years, there has been growing interest in whether L2 sound acquisition is influenced by orthographic input (Escudero et al., 2008; Bassetti et al., 2015). In this study we conducted both a perception and a production experiment with Polish learners of L2 German to test whether orthographic marking of German long vowels may aid learners in building phonological representations of vowel length when they do not make use of this feature in their native language. In contrast to Polish, German vowel duration is contrastive (as is quality, e.g., [mi:tə] "rent" versus [mɪtə] "middle"). It has been suggested that orthography may help learners of L2 German to overcome this problem when long vowels are explicitly marked by so called *lengthening h*, though this has not – until now – been experimentally tested (Nimz, 2011).

20 Polish German-as-a-Foreign-Language learners and 20 age-matched native speakers of German participated in the experiments: First, a picture-naming task with 24 German test words containing long vowels (and the same amount of filler words) was conducted. Half of the test words were long vowels which were marked by so called *lengthening h* (e.g., *Sahne* [za:nə] "cream"), while the other words were not (explicitly) marked in their vowel length (e.g., *Gabel* [ga:bəl] "fork"). In the judgement task, the same test words were manipulated in a way that vowels were either incorrect in their vowel length, their vowel quality, or both, and participants had to judge these items (and the respective fillers) for their correctness while being presented with the matching picture (crucially, no orthographic input was available in the task).

While the acoustic analysis of the productions showed a significant effect of language in that Polish learners' long vowels were significantly shorter than long vowels produced by German native speakers ($p<.001$), orthography did not seem to be an influencing factor as vowels which were explicitly marked for length were not produced significantly longer ($p=.17$). Interestingly, the perception data showed that words that were wrong in their length were significantly more identified as such than words which were wrong in their vowel quality ($p=.03$), suggesting learners represent vowel length more target like than vowel quality. Again, orthography did not seem to be the driving factor ($p=.98$ for accuracy; $p=.56$ for RT data).

Furthermore, in a questionnaire which was administered after the experiments, all Polish participants affirmed that they were aware of the existence of long and short vowels in German; however, only one participant knew that vowels differ in their quality as well. Therefore, a different kind of ancillary knowledge than orthography, namely metalinguistic awareness, may play an important part in forming L2 sound representations. However, this does not seem to play a role in the productions of intermediate learners.

Keywords: L2 perception, L2 production, vowel length, orthography, L2 German, Polish

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"Are they still Russian-speaking?": Comparing the heritage learners of Russian in non-formal frameworks in Israel and in Italy

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This paper will present the results of a field study conducted in Israel and Italy in 2014. The aim of the study was to investigate the process of language acquisition by students from Russian speaking families who are enrolled in non-formal Russian educational networks. Fifty-seven adolescents from Israel and 45 adolescents from Italy in the 8-15 year-old age bracket took part in the study. All of them can be defined as heritage language (LH) learners (Valdés, 2000; Polinsky & Kagan, 2007). The research was based on a specially designed test consisting of an oral and written part.

Although there are substantial differences between the Russian speaking populations in the two countries our research shows that motivation for learning Russian, as well as the difficulties faced during the learning process, are very similar in both samples. Case system, verbs aspect, and the verbs of motion were found mostly challenging for all the subjects. Oral proficiency in both groups is much higher than written proficiency. Integrative motivation prevails over instrumental for most of the respondents. These common challenges provide the perfect impetus to write teaching materials that can at least partially be used in many countries outside the Russian Federation.

Keywords: heritage learners, bilingual education, learning Russian, immigrant languages

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Speech-associated attitude of Slovenian stuttering and nonstuttering preschool children

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It has been repeatedly shown that the attitude toward speech of both school-age children and adults who stutter is significantly more negative than that of nonstutterers (Brutten & Vanryckeghem, 2007; Vanryckeghem & Brutten, 1997). Only in recent decades, researches evidenced that children as young as three show an awareness of disfluency (Ambrose & Yairi, 1994; Ezrati, Platzky, & Yairi, 2001). This, together with the fact that attitudinal differences between those who stutter (CWS) and those who do not (CWNS) were evidenced at age six (Vanryckeghem & Brutten, 1997), led researchers to look for a way to investigate negative speech-associated belief of preschoolers and kindergartners who stutter. Toward this end, Vanryckeghem and Brutten designed the KiddyCAT© - Communication Attitude Test for Preschool and Kindergarten Children Who Stutter (2007), a test procedure which directly assesses the communication attitude of preschoolers.

To provide normative data for the Slovenian version of the KiddyCAT© (Vanryckeghem & Brutten, 2007), 49 preschool CWS (32 boys and 17 girls) and 75 preschool CWNS (39 boys and 36 girls), divided into two subgroups according to age – "younger" 3 - 4,5 years old and "older" 4,5 - 6 years old, were administered the KiddyCAT - SLO.

The scores of CWS were more widely distributed than those of CWNS. The mean score for CWS was statistically significantly higher than that for CWNS, indicating that preschool CWS report a more negative attitude toward their own speech than preschool CWNS. In addition, it was observed that the mean KiddyCAT score of CWS increased with age, whereas an opposite observation was made for CWNS. The mean difference in scores between younger and older preschoolers was not statistically significant in either group. Gender did not affect the test scores. A high Cronbach alpha correlation for both groups indicates that the KiddyCAT – SLO is an internally reliable instrument that can be used to compare the communication attitude of preschool CWS and CWNS.

The Slovenian KiddyCAT version is a useful tool, providing the therapist with a view of inner reactions of a CWS. It follows that the KiddyCAT can provide baseline information against which to evaluate potential improvement in the establishment of a more positive belief system.

Keywords: stuttering, preschool children, speech-associated attitude, KiddyCAT

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Bilingual aphasia test: A pilot study of 50-60 and 65-70 monolingual Slovenian non aphasic speakers, compared to 50-80 Italian-Slovenian and Slovenian-Italian bilingual non-aphasic speakers

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The Bilingual Aphasia test, designed to assess each of the languages of a bilingual or multilingual individual with aphasia in an equivalent way, was developed in several languages (59 languages in online version).

The first attempt of adaptation into Slovenian language was in 1990. The final adaptation and translation of the test was in 2011. In 2012 (ICPLA 2012, Cork), we presented the first results obtained from a pilot study on 20 non aphasic monolingual Slovenian speakers aged 50 - 60, and a pilot study on 20 non aphasic monolingual Slovenian speakers aged 65 - 75. In detail, we analysed the results between males and females, and between different levels of education. We have also tested the adequacy of adaptation into Slovenian language. For the older group of participants we analysed the correlations between the Bilingual Aphasia test (BAT) and the Mini Mental State Examination (MMSE) scores, the differences in scores between males and females on the BAT and the MMSE, the differences between degree of education and the differences on the BAT scoring between those with low scores on the MMSE and those with high scores on the MMSE. A study of bilingual Italian - Slovenian and Slovenian - Italian speakers from Slovenia has not been done before.

The purpose of this research was to determine the adequacy of Slovenian version of the BAT for all ages, levels of education, gender and language and to analyze the performance of 24 bilingual speakers from Slovenia (12 males and 12 females, aged from 50 to 60, from 60 to 70 and from 70 to 80; in each group 4 speakers have Italian as a dominant language, and 4 have Slovenian as a dominant language).

Results show us that gender, education and language don't statistically significantly affect the BAT scores, although females, who are higher educated and younger show better results, comparing to males, that are older and less educated speakers. Slovenian speakers show better results in their dominant language, Italian speakers show greater equality in both languages. Variability increases when the test is in the non-dominant language. In the part C of the BAT test, when translation is required, Italian - Slovenian speakers aged from 50 to 70 show better results than Slovenian - Italian, possibly, due to their everyday use of two languages. In the oldest group scores are similar. Averages on the BAT - SLO and the BAT - ITA scoring are negatively correlated with age, decreasing in the oldest group. Results show that age statistically significant affects scores on the BAT in bilingual speakers and differences between younger (50-60) and older group (70-80) occur.

Keywords: bilingual aphasia test, bilingualism, Slovenian, Italian

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Slovenian phonological development and parent-rated intelligibility in pre-schoolers

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The Intelligibility in Context Scale, a parent rating scale of children's conversational intelligibility, is now available for a number of languages (ICS: McLeod, Harrison, & McCormack, 2012). The expected age ratings for the ICS for Slovenian-learning children and the relationship of the ICS to developmental phonological measures are as yet unknown, however. Aim: The current paper will thus compare the ICS ratings with a number of phonological measures for Slovenian-learning preschool children's production of single words: percent whole word match/correctness, phonological mean length of utterance, syllable and word shape match, percent phonemes and percent consonants correct (overall and by word position), percent vowels correct, consonant inventory size, and phonological mismatch patterns (processes). A moderate correlation of single-word phonological measures is expected with the ICS, a broad measure of general speech success in conversational contexts. Both age and participant status (with or without protracted phonological development, PPD) are expected to be significant variables. Method: Participants were 98 Slovenian-speaking monolingual and multilingual preschoolers (aged 2;2 to 5;8), with and without PPD. A 100-word elicitation tool (Ozbič, Kogovšek, Košir, Stemberger, & Bernhardt, 2009) was used that samples a full range of word structure and segmental characteristics of Slovenian: 21 consonants and 5 major allophones, 8 vowels and several diphthongs) across word positions, a full range of word length, stress patterns and word shapes in CV sequences, with many diconsonantal clusters, including less common cluster types crosslinguistically (e.g., /zb/, /sv/). Parents completed the ICS at home before their child's speech assessment, also filling out a questionnaire about languages spoken, siblings, and concerns about child's speech and language development. Native speakers of Slovenian audio- and video-recorded the children in their preschools and transcribed the samples according to project transcription conventions and the input of phonetically trained listeners. Phonological measures are being derived with the computer analysis program Phon and spreadsheets. Statistical correlations will compare the ICS and phonological measures, taking into account participant age and status as typically developing or with PPD. Results: ICS ratings for the following groups were as follows: for ages 2;2-2;11 M=3,76, for ages 3;0-3;11, M=4,49; for ages 4;0-5;0, M=4,76 and for ages 5;0-6;0, M=4,75. A pilot study for Slovenian (Kogovšek & Ozbič, 2013) show similar results, although McLeod et al. (2012) and Ng, To and McLeod (2014) reported a lower mean (M=3,93 / 4,37) for older English / Cantonese speaking children. Transcription and analysis for the phonological measures are underway. Discussion: The outcomes of this study will be unique across languages, including for Slovenian, in providing quantitative comparisons with qualitative parent rating scales of intelligibility in children. Results will also provide speech-language therapists with typical benchmarks and risk factors for PPD for the ICS and phonological single-word measures.

Keywords: protracted phonological development, intelligibility, speech measures, ICS

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Sliding articulation in Slovenian preschool children, aged from 3 to 7 years

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This research, part of an ongoing cross-linguistic study of protracted phonological development (PPD), focuses on the speech development of Slovenian preschool children, to get insight into the speech development and speech motor control, from an unstable to a more stable articulation, requiring integration, differentiation and refinement (Green, Moore, Higashikawa, & Steeve 2000). Slovenian has 6 sibilants, requiring sibilant contrast (Perkell et al., 2004) between the alveolar sibilants /s/ and /z/, and the palato-alveolar sibilants /ʃ/ and /ʒ/; further in two affricates, namely /ts/ and /tʃ/, and the voiced /dʒ/ in foreign loan words. [dz] occurs as allophone only. The alveolo-palatal sibilants [ɕ] and [ʑ], the alveolo-palatal affricates [d͡ʑ] and [t͡ɕ], the palatal fricatives [ç] and [j] are the children's most frequent solution when articulation is challenging. Aims: to describe the speech production in term of processes, to determine the amount of sliding articulation and to determine when and where sliding articulation takes place. Method: Participants were 54 Slovenian-speaking monolingual preschoolers (aged 3 to 7), with and without PPD. A 100-word elicitation tool (Ozbič, Kogovšek, Košir, Stemberger, & Bernhardt, 2009) was used that samples a full range of word structure and segmental characteristics of Slovenian: 21 consonants and 5 major allophones, 8 vowels and several diphthongs) across word positions, a full range of word length, stress patterns and word shapes in CV sequences, with many diconsonantal clusters, including less common cluster types crosslinguistically (e.g., /zb/, /sv/). Native speakers of Slovenian audio- and video-recorded the children in their preschools and transcribed the samples according to project transcription conventions and the input of phonetically trained listeners. Phonological measures are being derived with the computer analysis program Phon and spreadsheets. Results: Sliding production occur in children from 4;0 to 4;6 and from 4;6 to 5;0; five words ([ˈsok], [ˈʃal], [ˈʃola], [ˈʒaba], [ˈʒoga]) with simple syllable shape (CVC, CVCV) are subjected to sliding articulation. Sliding production occurs in sibilants fricatives /ʃ/ and /ʒ/, and /s/ and /z/, only, but not among affricates with sibilants. It occurs in younger (4;0-4;6) and older (4;6-5;0) typical developing children with WWM measure from 59% to 93% and in older (4;6-5;0) children with notable PPD with WWM measure from 39% to 51%. Results show a sliding articulation from a standard Slovenian phoneme /s/ or /z/, or from the palatalized [ɕ] or [ʑ] to the target phoneme /ʃ/ and /ʒ/; whereas only one sliding articulation from a standard Slovenian phoneme /s/ to an alveolo-palatalized [ɕ] among a child with notable PPD with WWM measure of 51% occurs. Conclusion: In Slovenian language sliding articulation occurs less frequently than other phonological processes, in sibilants only and among children with typical and protracted phonological development, predominantly when the target phoneme are /ʃ/ and /ʒ/ .

Keywords: phonological development, protracted phonological development, phonological disorders, sliding articulation

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Tag questions used by Turkish-Danish bilinguals: A developmental profile

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Tag questions have attracted attention from both syntactic and pragmatic point of view. In the acquisition process, children master not only the syntactic structure of the tag questions but the functions conveyed as well. The acquisition process, therefore, is affected by the syntactic structure of a particular language, which, consequently, may have an impact on the acquisition process of bilinguals. For example, in Turkish, tag questions are formed by adding either `değil mi? (isn't it?)' or 'öyle mi? (is that so?)', both of which are tagged to affirmative and negative predicates either verbal or nominal (Göksel & Kerslake, 2005:289-290). On the other hand, in Danish, there are three basic types of tags, which are adverbial tags, sentential tags and tags of the wh-type (Heinemann, 2010:2707). The fact that the bilingual child will choose the language requiring less effort (Mithun, 2012) and the syntactic differences between Turkish and Danish in terms of tag questions have motivated this study.

The aim of this study, therefore, is to investigate the use of tag questions in the conversations of bilingual Turkish-Danish speaking children in order to draw a developmental profile in the use of tag questions in the bilingual setting to see if acquiring another language and the transparent nature of Turkish tags makes a difference in the acquisition process. Within this framework, the following research questions will be answered.

1. Do bilingual Turkish-Danish speaking children use tag questions in Turkish or in Danish or both?
2. Which form of tag questions do children use in their conversations?
3. Does language mixing affect use of tag questions?
4. Do gender and age have an effect on the use of tag questions?

For this purpose, spontaneous conversations of bilingual Turkish-Danish grade school students from Grade 1 through Grade 9 have been studied. For the present study, all grades from the 1st to 8th grade were included in order to be able to see the developmental profile. In each grade, subgroups, a boys-only group and a girls-only group were included in the analysis in order to reveal any possible gender differences in the data. Therefore, we have 10 groups, 34 participants, in total. For the data analysis, the function of each occurrence of tag questions is defined in relation to the research questions. The raw numbers and frequencies will be considered in terms of gender and age.

Keywords: tag questions, bilingual conversational setting, Turkish-Danish bilinguals

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Code-mixing by bilingual children as a window into language dominance

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It is well-documented that children of immigrants often undergo language dominance shift as a result of increased exposure to the mainstream language of the environment (Bialystok, 2001; Portes & Schauffler, 1994; Ro & Cheatham, 2009). For young children, this increase of exposure is often the result of schooling in the mainstream language. One of the ways in which this shift can manifest in natural speech is through language choice and, in particular, intrasentential code-mixing. Studies on young bilinguals' code-mixing indicate that when children are speaking in their weaker language, the dominant language is often used as support (Bernardini & Schlyter, 2004; Gawlitzek-Maiwald & Tracy, 1996; Jisa, 2000; Petersen, 1988). This paper investigates the shift in language dominance in Korean-English bilingual children living in the U.S. The children in the study are four sequential bilingual children who were born in the U.S. to Korean-speaking parents and spoken exclusively Korean until they began attending English-medium preschool. Spontaneous play interaction data was collected on a monthly basis across a two-year span following their entrance into English-medium schools in order to investigate the shift of dominance. The children were video- and audio-recorded in their homes while interacting with their parents, with whom they were accustomed to speaking in Korean. In observing the children's use of Korean, English, and Korean-English code-mixed utterances over time, it was expected that the amount of Korean utterances would decrease, while the amount of English and code-mixed utterances would increase due to the shift of language dominance. Findings revealed that there was a downward trend of the use of all-Korean utterances in the children's interactions with their parents, as well as a slight upward trend for the amount of all-English utterances used. However, contrary to prediction, the amount utterances containing intrasentential code-mixing of Korean and English remained stable across the two years for all children. Furthermore, the code-mixed utterances revealed high-level complexity in both the phonological and syntactic structure, indicating sophisticated knowledge of both languages. The paper will argue that code-mixing is not an indicator of weakened language proficiency, in accordance with previous research on bilingual speech (Auer, 1998; Grosjean, 2012; Gumperz, 1982; Myers-Scotton, 1993). Rather, the ability to code-mix is a sophisticated communicative strategy that showcases the dynamic practices of these individuals and expression of their identities as bilinguals (Chung, 2006; Shin, 2010).

Keywords: code-mixing, bilingual, Korean, language dominance, language loss, child L2

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Three-year-old children acquiring South African English in Cape Town

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Background*:* South Africa has eleven official languages, yet speech acquisition in this context of rich linguistic diversity has not been well-researched. Some recent studies have detailed development of isiXhosa phonology (Maphalala, Pascoe, & Smouse, 2014) but little work has focused on the typical acquisition of multiple languages in this context, and speech development of South African English has yet to be detailed.
Aims and Objectives*:* This paper describes the development of speech in 3-year-old children acquiring South African English in Cape Town. The study objectives were to describe (a) the phonological processes and phonemic inventory of the participants by language background (monolingual, bilingual and multilingual) and in relation to other normative data collected for different populations; (b) To determine the prevalence of 3-year-old children with speech disorders in our sample of the population, and (c) To describe the diagnostic category of participants with speech disorders with reference to Dodd's (2005) diagnostic framework.
Participants*:* One hundred and fifty children between the ages of 3;0 and 3;11 acquiring South African English were assessed. They were selected from a range of different areas in Cape Town representing a variety of socio-economic backgrounds. Children were excluded from the study where languages other than English, Afrikaans or isiXhosa (the three main languages spoken in the region) were spoken.
Method: Participants were individually assessed using the Articulation, Phonology and Inconsistency subtests of the Diagnostic Evaluation of Articulation and Phonology (DEAP, Dodd et al., 2002).
Results*:* Phonological processes and inventories of the children are broadly comparable with normative data for English speech acquisition documented in the literature. First language speakers of Afrikaans or isiXhosa showed some aspects of English phonological development linked to influences of their first language. Approximately 5% of children in the sample were found to have speech difficulties, and of these children the greatest proportion exhibited phonological delays.
Discussion*:* Clinically, there is a lack of information about typical speech sound development in South African children. This information is urgently needed by Speech and Language Therapists practising in the region to assist in the identification and management of children with speech difficulties. Theoretically the study contributes to knowledge of typical speech development in multilingual contexts

Keywords: South African English, isiXhosa, Afrikaans, acquisition, speech delay

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Is the L1 or the L2 a stronger source of transfer in L3 learners? Evidence from L1 Mandarin, L2 English, L3 Spanish speakers

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The major question in L3 phonological acquisition research is which of the previously learned languages - the L1 or the L2 - acts as the source language. Recent work has observed that cross-linguistic influence is more likely to originate from the L2 in early L3 learners, regardless of the languages involved, but that as learners become more proficient in the L3, transfer from the L1 is favoured (e.g., Hammarberg, 2009; Wrembel, 2010). However, L1-based transfer has also been reported in early learners (Li, 2014) and our understanding of what interaction of factors (e.g., typological similarity, proficiency) may lead to L1 over L2 transfer is limited. In this paper, I investigate the acquisition of L3 Spanish by L1 Mandarin, L2 English speakers. If transfer is more prevalent from the L2 at early L3 stages, then the production of beginner L1 Mandarin, L2 English learners of L3 Spanish should be characterized by transfer primarily from their L2 English, and as learners become more proficient in Spanish, their L1 Mandarin should shape their L3 production to a greater extent.

Fourteen L3 Spanish speakers were recorded while reading a short passage in Spanish. Eight L1 English, L2 Spanish and six L1 Spanish participants were also recorded to act as controls. Ten native Spanish speakers listened to the passages and were asked to indicate what they believed the native language of the speakers to be. L2 and L3 oral proficiency were determined by accentedness ratings performed by five native English and five native Spanish speaker judges. Preliminary results indicate that the six least proficient L3 Spanish speakers (accentedness ratings of 1/5) and an additional four participants of intermediate proficiency (mean 2.33/5) were identified as L1 Mandarin speakers, whereas the remaining four were identified as native English speakers (mean 1.79/5). These results are inconsistent with recent work and reveal that the L1 can be a stronger source of transfer, both in less and more proficient L3 speakers. The effect of L2 proficiency was also analyzed, but was not found to be a significant factor. One possible explanation for the different results in the present study is the degree of typological distance between the participants' three languages. In previous studies where L2-based transfer was reported, all languages were Indo-European. In the present study, the L1 was Sino-Tibetan, compared to the L2 and L3 which were Indo-European. Li (2014) investigated a similar combination of languages (L1 Mandarin, L2 English, L3 French) and also found evidence of L1-based transfer (from L1 vowels). While we know that similar languages can provide a source of cross-linguistic influence (De Angelis, 2007), the results of this study provide evidence that cross-linguistic influence can also occur from typologically distant languages (i.e., Mandarin to Spanish).

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Prosodic-phonetic biases and the acquisition pathway: A cross-linguistic study of VC timing

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When learning to speak, infants' exposure to the distributional frequencies (in e.g., syllable structure, etc.) of the ambient language can subtly influence the developmental path followed (Vihman & Velleman, 2000; Prieto et al., 2006) despite common neurophysical constraints as the infant capitalizes on that language's statistical properties to learn its structures (Saffran et al., 2003). Languages also differ in the way structure is phonetically implemented, exhibiting what we term prosodic-phonetic biases (PPBs). How do children acquire these biases, and what impact might they have on the acquisition pathway? In this paper we examine the acquisition of VC sequences in Norwegian and English, the temporal coordination of which varies systematically in both languages, but in different ways. In Norwegian, coda consonant duration depends on preceding vowel duration e.g., [pe:n] 'pretty'~ [pen:] 'pen', while in English, vowel duration is conditioned by the [voice] status of a coda obstruent ('pre-fortis clipping') e.g., [ba:g]~[bak].

Previous research shows English ambient infants already shorten vowels before voiceless codas by the first word stage (Song et al, 2012, 2013; Buder & Stoel-Gammon, 2002), but little is known about the temporal coordination of VC as a rhyme unit, and how this interacts with competing temporal demands, e.g., signaling a tense/lax vowel contrast. We analysed productions of 9 children aged 2;6, 4 and 6 years, elicited via a picture-naming task which prompted monosyllabic words containing the relevant features. In English, we found VC timing relations differentiating [voice] in C by 2;6 years (mean V duration < 50% of VC duration in fortis cases and > 50% of VC duration in lenis cases) but increasingly reinforced with age (mean V/VC reaching 72.5% for lenis context, and as little as 30.7% for fortis context). In contrast, early use of V duration to signal a tense/lax contrast attenuates with age, as spectral cues are increasingly employed. In addition, articulatory factors influence early productions but attenuate with phonetic mastery.

These findings suggest the acquisition pathway is determined not just by developing articulatory skills and knowledge of a particular phonological system, but also by a play-off between competing uses for duration as a linguistic-phonetic 'device' for implementing that system. In learning to speak, even once children are aware of a phonological structure and have the phonetic skills to implement it, they still have to negotiate the complex mapping between the two. Our study suggests these mappings themselves take some time to fall into place, and competition *between* mappings may be a contributing factor to the time taken and the pathway taken. Since these mappings are language-specific, we expect to find subtle but systematic differences in the Norwegian data, which we are currently analysing.

Keywords: acquisition, VC timing, phonetic, phonological, Norwegian, English

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Analysing L2 pronunciation proficiency

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Insufficient skills in pronunciation can be very damaging to the intelligibility of L2 speech, but relatively little is known about the way in which pronunciation proficiency is acquired and displayed across proficiency levels (e.g., Hansen Edwards, & Zampini, 2008). The Common European Framework of Reference for Languages (CEFR; Council of Europe, 2001), for example, provides little guidance: 'Pronunciation' is absent from the CEFR Spoken Language Use scale, and only skeletal descriptors can be found in the 'Phonological control' scale, e.g., "pronunciation is clearly intelligible even if a foreign accent is sometimes evident and occasional mispronunciations occur" (CEFR B1). It is unclear which phonological and prosodic properties learners have to master to meet the criteria that are left implicit in these descriptors. Also, although it is well-known that learners at lower levels often transfer properties from their native language (L1; e.g., Major, 1987), it is unclear how this affects the development of pronunciation proficiency from one level to the next. The picture is further obscured by the fact that phonological and prosodic acquisition do not necessarily proceed in a uniform fashion, as some features are subject to transfer while others show common developmental paths across languages (e.g., Li & Post, 2014).

Taking an empirical approach, we aim to build a framework for understanding the criterial features of L2 pronunciation at different proficiency levels, which we define here as the 6 CEFR levels in L2 English. We tested a set of quantitative measures for their robustness in discriminating between the different levels in order to identify their criterial features while varying L1 background (German, Spanish, and Korean, which have different degrees of typological distance to English). The measures were a set of rhythm metrics (developed to quantify certain aspects of speech rhythm; White & Mattys, 2007), as well as measures of accentual and phrase-final lengthening, and syllable complexity.

The findings show that all of the measures are discriminative both in terms of the learners' L1s and their CEFR levels. Interestingly, although the learners with the typologically similar language background – German – showed an early advantage for some of the measures, they were often still as far off target as the other L1 groups at the intermediate B levels. The findings also showed that even at the highest proficiency level, some properties were not fully mastered. Overall, syllable complexity was more discriminative at lower levels, while rhythm metrics and lengthening discriminated at different higher levels of the CEFR scale. We will discuss how these findings allow us to develop a framework of criterial features for spoken language competence that can be applied fruitfully in L2 assessment and teaching, and can be used in further delineating the construct of L2 pronunciation and intelligibility.

Keywords: second language acquisition, pronunciation teaching, pronunciation assessment, speech prosody, CEFR, criterial features

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The L3 production of Spanish spirants by native Romanian speakers

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Several studies have focused on the L2 acquisition of Spanish [β ð ɣ] by native English speakers (e.g., Zampini, 1994; Face & Menke, 2009); however, no studies have investigated spirantization among native speakers of languages other than English. Moreover, the L3 production of these segments remains largely unexplored. Accordingly, this study examined the L3 production of [β ð ɣ] by Romanian speakers with high L2 English proficiency – while Romanian lacks all 3 spirants, English has a fricative similar to the Spanish interdental approximant [ð]. It was predicted that the successful acquisition of the English interdental fricative /ð/ may result in a higher rate of spirantization when producing the Spanish interdental [ð], but not bilabial [β] or velar [ɣ], since positive transfer from the L2 into the L3 can occur if a speaker is highly proficient in the L2 (Gut, 2010; Llama, Cardoso, & Collins, 2010; Wrembel, 2010). 10 participants produced [β ð ɣ] intervocalically in unstressed syllables in an elicited imitation task. Productions were categorized as stops, approximants or fricatives using Praat (Boersma & Weenink, 2012). Results show that spirantization rates were highest for bilabial [β] (95%), followed by interdental [ð] (58%), and lastly, velar [ɣ] (45%). Although interdental [ð] did not have the highest rate of spirantization of all 3 sounds, it is important to note that, regarding the type of spirant produced, the interdental was realized as a fricative more often than as an approximant (32% versus 25%, respectively), while bilabial [β] and velar [ɣ] were produced as approximants more often than fricatives ([β]: 31% fricative, 63% approximant; [ɣ]: 20% fricative, 25% approximant). This suggests that mastering the L2 English interdental may result in positive English-based transfer, at least to some degree, since as a spirant, [ð] was a fricative more often than an approximant. This study contributes to the growing body of research on L3 phonological acquisition by investigating the role of L2 proficiency in learners' L3 production.

Keywords: L3 acquisition, phonology, transfer

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Second dialect imitation: The production of Ecuadorian Spanish assibilated rhotics by Andalusian speakers of Spanish

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This study aims to determine whether equivalence classification (e.g., Flege, 1995) operates in the same way in second dialect (D2) phonological acquisition in comparison with second language (L2) phonological acquisition. As such, it will investigate assibilated rhotic production of Ecuadorian Spanish by Andalusian Spanish speakers. Although there has been considerable growth in interest in D2 phonological acquisition (e.g., Babel, 2009; Nielson, 2011), not much is known about whether the same mechanisms that are responsible for L2 production also underlie D2 production. Although Ecuadorian Spanish is characterized by assibilated/fricative rhotics (e.g., Lipski, 1994), Andalusian Spanish is mainly characterized by a trill and a tap (e.g., Blecua, 2001). Moreover, it includes sibilants such as [ʃ] as an allophonic variant of the affricates such as [t͡ʃ] (e.g., Carbonero, 2001). Therefore, based on Flege (1995), similar to English speakers (see Rafat, 2015), assibilated rhotics should be classified as 'similar' sounds and produced as a [ʃ] or other sibilants. 10 adult Andalusian speakers were asked to do two imitation/repetition tasks. The participants were tested with real words (30), nonce words (30) and fillers (30) at two different times. The stimuli for the imitation task were recorded by a male speaker of Ecuadorian Spanish. The results were analyzed both auditorily and acoustically. Whereas in Rafat (2015) naïve English-speaking participants mostly produced assibilated rhotics as a [ʃ], the preliminary results of our study show that 34.25% of the assibilated rhotics were produced as assibilated rhotics, 24.25% as trills, 25% as taps, 13.5% as sibilants and 3% as laterals. In all, the patterns diverge from previously reported L2 production data. We will explain the new findings by considering the phonemic status of [ʃ] (or lack thereof it) in Spanish and knowledge of the Spanish language.

Keywords: second dialect acquisition, phonology, imitation, production, Spanish

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Consonant cluster acquisition in Turkish-German bilingual children

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Background & aims: Due to their complexity, consonant clusters in monolinguals are acquired slowly and are frequently simplified in various ways during acquisition (e.g., McLeod, van Doorn, & Reed, 2001). Reductions of clusters usually follow sonority and sonority sequencing principles in that the least sonorous consonant is retained (Pater & Barlow, 2003). This pattern has also been found in bilingual children (e.g., Yavaş & Barlow, 2006). However, as Turkish and German differ considerably in their phonotactic restrictions for clusters, the present study aims to investigate the cluster simplification patterns and the potential cross-linguistic influences in Turkish-German bilingual children.
Methods: In a cross-sectional design, 84 Turkish-German bilingual children aged 3;0-5;5 years were divided into five age-groups (i.e. 3;0-3;5 (N=10); 3;6-3;11 (N=24); 4;0-4;5 (N=18); 4;6-4;11 (N=25); 5;0-5;5 (N=7)) and assessed on their phonological skills using single-word naming tasks in both languages. The children's phonological processes affecting consonant clusters were analysed. In case of cluster reductions, the sonority of the remaining consonants was examined.
Results: German consonant clusters were most frequently simplified by two phonological processes: cluster reduction and epenthesis of vowel (mainly schwa). In Turkish, only cluster reductions occurred. German word-initial and Turkish word-final clusters (the only phonotactic option) were mainly reduced to the stop, independently of its position in the cluster. Fricatives of German clusters were retained when they occurred as the first element in combinations with /l/ and /ʁ/, with /kv/ being an exception. Reductions of German word-final clusters also mainly followed sonority principles with the exception of /nasal/+/obstruent/ clusters. Those were reduced to the nasal.
Discussion: The epenthesis of vowel as a frequent process to split up CC(C)-syllable structures may reflect an influence of Turkish phonotactic restrictions (which do not permit word-initial clusters) on German productions. By retaining the less sonorous consonant in cluster reductions in German initial (and most final) and Turkish final clusters, Turkish-German bilinguals follow sonority principles most of the time. The exceptions as well as the implications of these findings for clinical practice will be discussed.

Keywords: phonology, acquisition, consonant clusters, Turkish-German bilinguals

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Speech breakdown in a multilingual child with hearing loss

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Aim and motivation: This study is an investigation of multilingual dysfluency patterns in a hearing-impaired child. Although there is a large body of research examining speech and language development in children with hearing loss, very few of these studies involve children acquiring two or more languages (Crowe & McLeod, 2014). And although hearing loss has been linked to speech difficulties such as dysfluency (Howell, 2007), there is virtually no research on dysfluency patterns in multilingual children with hearing loss. Research on non-hearing impaired populations indicates that the two languages may have different dysfluency profiles (Van Borsel, Maes, & Foulon, 2001); however, the scarcity of relevant data calls for further research on the topic.
Method: The present study aims to fill this gap, by examining speech production in a multilingual child with bilateral hearing loss. Data were acquired as part of a longitudinal study of speech and language development in a Greek, Lombard, English and Welsh speaking child. The child presented with chronic mild hearing loss due to otitis media with effusion. We analyse recordings of naturalistic conversational data acquired during a period of dysfluency just before the child started attending speech and language therapy, around the child's fifth birthday. Recordings were transcribed and data were annotated for dysfluencies. Analysis focusses on dysfluency patterns in each of the child's home languages (Greek and Lombard, in a one-parent one-language household). In addition, we examined dysfluency patterns in relation to the use of two languages in a single conversation.
Results and analysis: The dysfluency profiles of the two languages were explored and comparisons were performed. Analysis revealed similar dysfluency patterns: fillers were prevalent in both languages, while repetitions and other dysfluency types were less common. Cross-language comparisons of dysfluency frequency yielded different results depending on measures adopted. Moreover, preliminary analysis of bilingual sessions reveals a change in dysfluent behaviour when switching languages in a conversation, suggesting that there may be a link between language switching and dysfluency patterns. We discuss these findings in relation to familiar data.
Conclusion: The present study offers the first – to our knowledge – dysfluency profile in multilingual development with hearing loss.

Keywords: multilingualism, language development, dysfluency, hearing loss

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The discrimination of Spanish lexical stress contrasts by French-speaking listeners

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The goal of the present research is to examine the role of the acoustic parameters involved in the discrimination of Spanish lexical stress contrasts by French-speaking listeners, and to validate the results of a previous study, in which we used a stress identification task (Schwab & Llisterri, 2011). The findings of this study were that fundamental frequency (f_0) was the most relevant parameter in the identification of the stress position by French-speaking listeners, and that the time needed to correctly identify the stress pattern of the word was related to amplitude (alone or combined with duration).

The participants of the present experiment were ten French-speaking advanced learners of Spanish and 10 French-speaking participants without knowledge of Spanish. They performed an AX discrimination task, in which they heard pairs of Spanish trisyllabic words, and had to indicate whether the position of stress in the two stimuli was the same or different. The stimuli we used were *Base* and *Manipulated* stimuli. The *Base* stimuli (i.e. stimuli with the original stress pattern) were proparoxytone (e.g., *número*), paroxyone (e.g., *numero*) or oxytone (e.g., *numeró*). The *Manipulated* stimuli were stimuli with a stress shift from the original position to the next syllable, as described in Llisterri, Machuca, de la Mota, Riera, & Ríos (2003). More specifically, the so-called PP>P *Manipulated* stimuli presented a stress shift from the antepenultimate syllable to the penultimate syllable, while the so-called P>O *Manipulated* stimuli presented a stress shift from the penultimate syllable to the final syllable. In order to be able to examine the role of the three acoustic parameters involved in the perception of lexical stress (f_0, duration and intensity), we used *Manipulated* stimuli which presented the seven possible isolated and combined manipulations of the acoustic parameters. Each pair of stimuli that the participants listened to was composed of a *Manipulated* stimulus (e.g., PP>P) and a *Base* stimulus (e.g., PP or P). The Same/Different responses and the reaction times were analyzed by means of mixed-effects models.

The results supported the idea that the perception of an accentual difference depends on the acoustic parameters involved in the manipulation applied to create a stress shift. More specifically, we found that the role of the acoustic parameters varies as a function of the accentual pattern (PP>P and P>O) and the competence in L2. However, the time needed to perceive an accentual difference mainly depends on whether the acoustic parameters clearly indicate the stress position and on the accentual pattern, but does not depend on the competence in L2.

Keywords: lexical stress, L2, speech perception, French, Spanish

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Access to writing and the acquisition of obligatory liaison in second language French

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Liaison is a phenomenon of external sandhi that involves the production of a latent coda consonant (liaison consonant, LC) in prevocalic contexts (e.g., [z] in *des* [de] + *ânes* [an] → *des ânes* [dezan], (*some) donkeys*, but not in *des* [de] + *poules* [pul] → *des poules* [depul], (*some) hens*). The segmental content of the LC is thus dependent on the first word but produced as the onset of the second word: [de.zan]. As a consequence, word and syllable boundaries do not align. It has been argued that this misalignment constitutes potentially different difficulties for L1 and L2 learners (Wauquier, 2009).

In the early stages of L1 acquisition children typically misinterpret the LC as the lexical onset of word2, leading them to substitute the LC and to produce sequences such as [ɛ̃zan] instead of *un âne* [ɛ̃nan] (*a donkey*) (Wauquier & Shoemaker, 2013). These errors are unattested in adult L2 learners. Indeed although LC substitutions are present in adult L2 learners' productions, they can typically be attributed to the written form of the word ([gʁɑ̃daʁbʁ] for *grand arbre* [gʁɑ̃taʁbʁ]) (Thomas, 2004). At the same time L2 learners produce LCs without resyllabification (e.g., [dez.an] instead of [de.zan]), an error that has not been reported in monolingual acquisition. These errors have also been interpreted as being influenced by the written form.

However, to date, the vast majority of previous studies have focused on monolingual preliterate children or highly literate adult L2 learners with primarily written exposure to French. To bridge the gap between these two populations, we propose in this study a qualitative analysis of L2 learners without systematic written input.

This presentation brings together data from two beginning groups of French: preliterate children (*n*=3, L1: Swedish, age of onset of acquisition: 3;0-3;5) and adults who have had little to no formal instruction in French (*n*=10, L1: Chinese and Bengali). All learners received predominantly oral input without systematic written support. In addition a group of L1 children were tested at a pre-reading stage and at a post-reading stage. Productions of *un/deux* + noun (cases of obligatory liaison) were elicited using a picture-naming task.

Results from both L2 groups include productions previously reported for L2 learners (e.g., LC without resyllabification). However, both adults and children in this study also produce L1-like substitutions of LC (e.g., [ɛ̃zaʁbʁ] or even [dølaʁbʁ]) previously observed only in L1 development. In the L1 group, substitutions drop from the pre-reading to the post-reading testing. These and other results are discussed in the light of previous models suggested for L1 and L2 development of liaison as they bring into question previous assumptions about differing developmental paths for L1 and L2 learners.

Keywords: phonology, L2 acquisition, French

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Consonant harmony in typical and atypical children acquiring Farsi and the challenges of articulation and perception

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This article studies Consonant Harmony in typically developing (TD) children (ages: 2;8 to 4) and children with functional (non-organic) phonological disorder (PD) (age: 4;5 to 5;9) who are acquiring Farsi as their first language. Unlike majority of studies on developing phonologies which have focused mainly on place harmony (e.g. Dinnsen et al., 1997; Fikkert, 2003; Pater & Werle, 2003; Gerlach, 2010), this study focuses on both manner and place harmony. In the present study, the data are collected through a test called Naming-picture task in which children should produce the 132 different names elicited by 132 pictures of items generally encountered in children's daily life, including foods, animals and things. These data have been complemented by a 15-30 minutes free recording of children's spontaneous speech.

The results obtained from this study support the existence of both types of regressive and progressive assimilation in PD and TD groups. In total, both groups indicate more regressive assimilation than progressive one. Contrary to the findings from most previous studies that indicate the assimilation of coronals to dorsals in place harmony (Smith, 1973, Stoel–Gammon & Stemberger, 1994; Fikkert & Levelt, 2003; Gerlach, 2010), this study indicates the assimilation of dorsals to coronals and labials. Three types of manner harmony are also detected in TD and PD children, namely plosive, nasal and fricative harmonies. The plosive and nasal harmonies are observed in both groups; however, fricative harmony is merely found in TD group. Furthermore, the present study gives noticeable results regarding directionality in manner harmony, virtually not discussed in existing studies on consonant harmony. In both groups, fricative harmony is largely progressive (76%) while nasal harmony is largely regressive (93%). Moreover, though plosive harmony occurs in both directions in both groups, elder children in TD group indicate a greater tendency towards progressive harmony, while PD group and the younger children in TD group display the opposite tendency, i.e. regressive harmony.

After discussing the results in Optimality Theory (Prince & Smolensky, 1993; McCarthy & Prince, 1994), Articulatory Ease (Locke, 1983; Smit, 1993) and Articulation-Perception Interaction approaches (e.g. Jun, 1995; Wright, 2001), it is concluded that articulatory factors affect developmental acquisition both in TD and PD groups, though the influence of perceptual factors cannot be ignored. Furthermore, the observation that there are more regressive plosive harmony in PD group and in the youngest members in TD group than progressive plosive harmony supports the assumption that there is a relation between the direction of consonant harmony and the child's articulatory and/or perceptual ability.

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No immersion, no instruction: The formation of non-native vowel categories in child speech

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This study aims to map the native Dutch and non-native English vowels of Belgian children who have not been immersed and have not received any school-based instruction in English, but who are exposed to it through the media. A fairly large and recent body of research addresses second language perception and production by early learners either through immersion in an L2-speaking community (e.g., Flege et al., 2003; Baker & Trofimovich, 2005; Darcy & Krüger, 2012) or through classroom-based instruction (e.g., Mayo & Lecumberri, 2003; Muñoz, 2006). However, there is also a vastly expanding number of children who live in a monolingual community and yet are exposed to English as a Foreign Language (EFL) from an early age through various media. This study addresses the question to what extent children acquire the English vowel system in such a context: is this type of exposure sufficient for them to create new phonetic vowel categories?

Twenty-four Dutch-speaking children participated in the study (mean age: 10;6, range: 9;10-12;2 years). They were all living in Belgium, a traditional EFL country, and came from two different dialect regions. None of them had received English instruction in school, but all of them reported having at least some sporadic contact with English, for instance through television programmes or computer games. They all performed two Dutch picture-matching tasks, an English repetition task, and an English picture-naming task. The auditory stimuli were monosyllabic Dutch and English words containing each of 12 Dutch and 11 English monophthongs.

The vowel formants were analysed in Praat (Boersma & Weenink, 2014) by comparing the LPC (Linear Predictive Coding) analysis to the FFT (Fast Fourier Transform) spectrum. After removing outliers, 1983 Dutch and English vowels remained in the analysis. Lobanov-normalized vowel plots present the organization of these children's entire Dutch and English vowel spaces. Visual inspection of the plots, aided by the calculation of Euclidean Distances between vowels, reveals the dynamic nature of the creation of new phonetic categories: the children re-used Dutch vowel categories for English high front vowels, began to show distinct back vowel categories, and failed to create new categories for low front vowels. As a means to explore possible interactions between the vowels of the two languages, we will also present the results of cluster analyses, which show which vowels do or do not form separate clusters on the basis of their spectral properties.

Keywords: child speech, production, vowels, acoustics, Dutch, English

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Cross-linguistic microvariation in cluster production

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In the acquisition of consonant clusters, the most common cross-linguistic error patterns produced by children seem to be cluster reduction and cluster simplification, while other processes like coalescence, metathesis and epenthesis are rare (McLeod et al., 2001). However, for Norwegian, Simonsen (1990) and Yavaş et al. (2008) indicate that while both cluster reduction and simplification are common error patterns, epenthesis is a prevalent strategy. In three two-year-olds from Simonsen (1990), 20 % of the cluster errors are vowel insertions. McLeod et al. (2001) found vowel insertion in only 2.5-7.2 % of the errors. Could subtle differences between languages in how consonant clusters are realized by adults influence early strategies adopted by children? Clusters in Norwegian are said to have an open transition (Endresen, 1991:127), while English has a more close transition characterised by gestural overlap and no audible release of the first segment (Catford, 1977:220-226). This difference in timing and co-ordination may play a role in influencing cross-linguistic differences in cluster production strategies. As a first step, we investigate comparable consonant cluster productions in English and Norwegian adult speakers, to see to what extent the alleged differences in transition between the two languages exist. We look at word-initial clusters, focusing on three variables: i) duration overall and of the components of the cluster; ii) evidence for release of the first consonant, and iii) spectral evidence for epenthesis. Two English-speaking and three Norwegian-speaking women read lists of sentences containing the relevant clusters. Analysis was performed using Praat, and epenthetic vowels were identified both auditorily and acoustically. Preliminary results indicate that there is no difference in overall length of clusters between English and Norwegian. However, their internal structures differ: C1 is longer in Norwegian than in English, particularly when C1 is an unvoiced stop ($W=106$, $p=0.006$), while C2 is longer in English than in Norwegian ($W=2510$, $p<0.001$). We found no examples of epenthetic vowel in English. In Norwegian, epenthetic vowels were found in 57 % of the obstruent + liquid clusters. We predict that these differences in cluster production strategies will be reflected in the child data we are currently analysing.

Keywords: clusters, simplification strategies, input, phonetic, Norwegian, English

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Investigating the relationship between parental communicative behavior during shared book reading and infant volubility

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A large body of literature has established that there is a strong, predictive relationship between prelinguistic vocalization (babble) and later language development. In general, "better" babblers become "better" talkers: that is, they have been shown to reach linguistic milestones sooner, to have faster rates of vocabulary acquisition, and to achieve superior language outcomes at later ages (summary in Stoel-Gammon, 1998). In these studies, measures used to quantify babble include overall volubility, onset of canonical babble, variety of different consonants used, and number of different syllable shapes used. Several reasons for this relationship between babble and later speech and language development have been discussed. First, Stoel-Gammon (1998) describes speech as having a skill component and that with more practice (i.e. more and better babble), comes greater control and precision of the movement. Furthermore, increased practice of sounds and syllables in babble may facilitate mapping of specific movement patterns to the resulting acoustic output. This is described by Stoel-Gammon (1998, 2011) as the auditory-articulatory 'feedback loop' and is necessary for the production of words. Second, babies who are better babblers may receive more responsive feedback from caregivers and may engage in more and longer vocal interactions with adults, both of which have been associated with better current and later language ability as well as with earlier attainment of major language milestones (Tamis-LeMonda, Bornstein, & Baumwell, 2001; Zimmerman, Gilkerson, Richards, Christakis, Xu, Gray, & Yapanel, 2009). Additionally, contingent parent responses to infant vocalizations have been found to shape child vocalizations under controlled experimental conditions (e.g., Dunst, Gorman, & Hamby, 2010; Goldstein & Schwade, 2008). However, the concurrent relationship between characteristics of naturally occurring child-directed speech and infant volubility has not been explored extensively. The current study seeks to answer the following question: which caregiver communicative behaviors are associated with increased infant volubility during naturally occurring play activities?

The LENA Pro (Language Environment Analysis [LENA Foundation, Boulder, CO]) System was used to record 26 parent-infant (age 10-16 months) dyads during 15-minute play sessions with books in their home. Based on results from preliminary analyses, the parent behaviors measured for the current study include number of words produced, number of utterances/minute, number of questions, number of directives, and number of 'engaging and excited expressions' produced. Engaging and excited expressions include things like sound effects, animal noises, interjections, gasps, claps, etc. Correlational analyses are conducted to explore the relationship between parent communicative behaviors and infant volubility. Results may have implications for working with families of young children who present with or are at risk for delays in language acquisition.

Keywords: babble, prelinguistic vocalization, volubility, child-directed speech

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Entropy as a measure of mixedupness in erroneous speech

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There are several types of grammatical errors that appear in normal and disordered speech during first language, second language and bilingual development. In the literature, erroneous speech is evaluated by measuring these types of errors either individually (e.g., phoneme substitutions or deletions) or cumulatively (e.g., proportion of consonants correct (PCC), proportion of words correct (PWC), mean length of utterance (MLU) and its proportion (PMP) to the targeted MLU, phonological mean length of utterance (PMLU) and its proportion (PWP) to the targeted PMLU). These cumulative measures depend linearly on their component(s) and, consequently, their sensitivity to changes in their component(s) is constant. There are, however, instances in speech evaluation when a measure with higher sensitivity would be advantageous in discriminating performance between different speech samples. For this reason, *Entropy* (E) is proposed as a measure of evaluating speech by measuring the mixedupness of the different types of errors and their correctly produced targeted grammatical parameter. Speech entropy is defined as $E = - \sum p_i \log_2 p_i$, where p_i is the frequency of the ith type of realization in proportion to the frequency of the targeted grammatical parameter under examination, so that $\sum p_i = 1$. The entropy of correct speech is zero while maximum entropy is $\log_2 N$ and is attained when all the p_is are equal to 1/N, where N is the number of realization types. Near these p_is, the entropy is insensitive to their change. However, when the p_is are either small or large, entropy is very sensitive to their change and the measure of entropy would be an advantage over linear measures. For example, measuring morphemes without specifying their type as done by MLU, results in the following entropy of morphemes: $E = - p\log_2 p - (1-p) \log_2(1-p)$, where p is the proportion of produced morphemes to the targeted morphemes and (1-p) is the proportion of morphemes that are not produced. Comparing the sensitivity of entropy to the sensitivity of the PMP measure, which is appropriate in comparing morpheme speech performance across languages, yields that for p values and their change within the ranges (0, 1/3) and (2/3, 1), entropy is more sensitive than PMP which, in turn, is more sensitive than entropy within the range (1/3, 2/3). The same would be true in comparing the entropy of consonants to PCC. Entropy increases as errors are specified further. For example, if the phoneme is the phonological parameter under investigation, realizations may be divided into three types: correct, substituted, deleted. The sensitivity of entropy of phonemes is then compared to the sensitivity of PWP, the bi-linear model proposed by Ingram (2002) and examined further by Taelman, Durieux, & Gillis (2005) and Babatsouli, Ingram, & Sotiropoulos (2014). Ranges in values of the three realization types are found where entropy is more sensitive than PWP and vice versa. To complement the analysis, speech data are used from a normal Greek-English bilingual child in development as well as from normal and disordered English monolingual children.

Keywords: entropy, measure, errors, speech, first language, second language, bilingualism

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How much should phones weigh in computing phonological word proximity?

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Phonological word proximity, PWP, was introduced by Ingram & Ingram (2001) and Ingram (2002) to evaluate performance in child speech per word by weighing correctly produced in context consonants *twice* as much as produced vowels and substituted consonants. Taelman, Durieux, & Gillis (2005) computed PWP using large data, and others have used it to assess normal and disordered child speech. Babatsouli, Ingram, & Sotiropoulos (2014) obtained an explicit formula for PWP, cumulatively for all words in a speech sample, in terms of the proportion of consonants correct (PCC), the proportion of phonemes deleted (PPD), and the proportion of targeted consonants (PC). In the present study, the relative weight of phones is taken as an arbitrary number *n*, in order to compare the advantages and disadvantages of such a PWP to Ingram's PWP of n=2, in assessing child speech. The derived expression for PWP is similar to Babatsouli et al's (2014); however, the weights of PCC and PPD are now dependent on *n* as well as on PC. As the product nPC increases, the weight of PCC increases and that of PPD decreases; when *n* is greater than 2, the weight of PCC is greater than that of PPD; for n=2 the weights are equal, while for *n* smaller than 2, the weight of PPD is larger. However, the difference between PCC (or PPD) weights of different n's, which generally increases for increasing PC, remains effectively constant for PC larger than 40%. These results have implications on how to compute phonological word proximity (PWP) for assessment purposes. Smaller relative weights of phones guarantee larger phonological word proximities when the proportion of vowels produced is larger than the proportion of consonants correct, which is generally the case. In comparing phonological word proximity between two such samples with their difference in the proportion of phonemes deleted (PPD) being larger than their difference in the proportion of consonants correct (PCC), it is advantageous to use smaller relative weights of phones if larger differences in PWP are sought. When, however, changes in PCC are larger than changes in PPD, phonological word proximity (PWP) becomes more sensitive for larger relative weights of phones. Last, independent of the relative weight of phones, phonological word proximity is more sensitive than PCC when changes in PPD are larger than changes in PCC; otherwise, it is not. These results may guide the establishment of speech performance norms for normal children, as well as assessing children with speech sound disorders whose PCC values vary little across categories of word complexity, such as across monosyllabic or multisyllabic words with singleton consonants and monosyllabic or multisyllabic words with consonant clusters.

Keywords: consonants, word, measure, assessment, child, normal speech, disordered speech

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Linguistic profiles of Albanian-Greek bilingual children with SLI

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The present study aims at contributing to the on-going discussion on the linguistic profile of bilingual children with Specific Language Impairment (SLI) by reporting findings from Albanian-Greek (A-G) speaking children with SLI. In particular, we tested three A-G speaking children with SLI, aged 10, 9, and 5 year old, on subject-verb (S-V) agreement and object clitics in Albanian and Greek. We discuss these findings in comparison to the performance of typically developing (TD) A-G speaking children (N=12) matched to the SLI group on chronological age, sex and age of first exposure to Greek. Further analysis in light of published data from Greek monolingual children with SLI is provided.

Albanian and Greek are inflectional languages but Greek verbal inflection is richer than Albanian. Both of them are languages with object clitics and clitic doubling (Anagnostopoulou, 1994; Kapia, 2013). Previous studies of Greek preschool children with SLI indicated incomplete acquisition of agreement and difficulties for many (but not all) of them in object clitics while school age children with SLI show no significant impairments in these domains (Stavrakaki, 2005, for a review).

For the purposes of the present study, we employed two experimental tasks for language assessment (i) an object clitic elicited production task supported by pictures (6 target responses for each language) and (ii) an S-V agreement production task with 10 verbs for each language (in total, 60 forms per each language per child were elicited). The results indicated ceiling (or near ceiling) performance of TD A-G children on both tasks while the A-G children with SLI showed heterogeneous performance. In particular, the preschool A-G SLI child showed ceiling performance on object clitics in Albanian but not in Greek. In S-V agreement, he showed severe problems with Albanian and fewer difficulties in Greek. By contrast, the older bilingual A-G children with SLI showed no striking impairment for the tested structures. Notably, published data from monolingual Greek children with SLI indicate difficulties in the domain of object clitics and S-V agreement only in preschool and not in school age. We discuss these findings in light of the linguistic properties of Albanian and Greek and conclude that deficits in verb agreement and object clitics are not persistent in monolingual Greek children with SLI and bilingual A-G children with SLI. We suggest that exposure to two languages did not impede the linguistic performance of bilingual A-G children with SLI.

Keywords: specific language impairment, Albanian, Greek, morphosyntax

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Do phonological segments exist in speech/language production? A review

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Most research in linguistics and psychology presupposes phonological features/gestures organized into segments (e.g., Prince & Smolensky, 2004; Stemberger, 2009), while much research in speech science does not (e.g., Browman & Goldstein, 2000). I review the evidence for segmental representations, and clarify what is meant by the term "segment".

MAJOR FUNCTION: to group together features/gestures that occur together in a speech sound

POSSIBLE CONSEQUENCE #1: Time-locking of gestures (coordinated beginning/end)

POSSIBLE CONSEQUENCE #2: Attractor states in output

POSSIBLE CONSEQUENCE #3: Identity effects

POSSIBLE CONSEQUENCE #4: Chunking to increase speed and accuracy

With chunking, segments are an intermediate stage: first a unit such as /b/ is accessed, which then accesses features such as [Labial]. Effects of segments arise early in processing, effects of features late in processing. In speech errors and speeded word production, some phenomena show effects of segmental identity but not of non-identical similarity (identical phonemes in interacting words; perseveratory inhibition; form-based priming) (Stemberger, 2009). Chunking an inaccessible feature with more accessible features impairs access of the other features. If a child has restricted output (e.g., no fricatives), chunking is detrimental, because failure with manner of articulation may lead to failure with place and voicing. Segments imply strong time-locking of all gestures within a segment vs. weak time-locking of gestures in different segments. Lack of segments implies time-locking as strong between segments as within segments, and involving only a subset of gestures.

Developmental phenomena that will be addressed include:

KEEPING FEATURES/GESTURES TOGETHER: deletion of segments (= reduction of gestures to a low sub-threshold amplitude). (a) Because one feature is inaccessible. (b) Reduction of consonant clusters to one C, with predominant segmental retention of one C showing a preference for stops (/sp/ [p]), but minority non-segmental coalescence combining features from both targets (/sp/ [f]) showing a preference for fricatives (requiring two mechanisms).

TIME-LOCKING: Complexity of gestures within a segment (coronal and dorsal gestures in "dark" [ɬ]) delays mastery more than similar coarticulation between 2 segments (e.g., [nuː]).

ATTRACTOR STATES: (a) alteration of outputs to fit existing outputs; e.g., /sp/ coalesces not to novel bilabial [ɸ], but to existing labiodental [f]. (b) phoneme frequency effects.

IDENTITY EFFECTS: (a) where a segment is possible in medial position only if identical to a word-initial segment; e.g., [m] possible in *mommy* but not *hammer*. (b) Reduplication.

Segmental organization accounts for many types of data in adult speech-language production and in child phonological development. Non-segmental approaches must provide an explicit account, without incorporating an analogous type of segment-like representation.

Keywords: speech-language production; phonological development; phonological segments

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Accented input impacts phonological acquisition in bilingual preschoolers

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Bilinguals have to acquire more phonological categories than monolinguals, and use the appropriate categories in each language. This task is especially intricate when the bilingual's two languages seemingly share phonological categories that in fact have different phonetic implementations. Examples are the phonological categories 'voiced' and 'voiceless' that languages space differently along the phonetic voice-onset time (VOT) continuum. Dutch implements the phonological voiced-voiceless contrast with phonetically prevoiced and short lag plosives, whereas German uses short-lag and aspirated plosives. Bilingual children produce such voicing categories differently than monolinguals (e.g., Fabiano-Smith & Bunta, 2012; Kehoe, Lleó, & Rakow, 2004, and references therein), but most studies have only analyzed one of the bilinguals' languages. This leaves unanswered whether bilingual children have one or two phonological systems for their languages. Non-native productions in bilinguals are often accounted for in terms of negative transfer (cf. Goldstein & Bunta, 2012), which suggests that the bilingual acquisition process is qualitatively different from monolingual acquisition. To explore additional factors influencing bilingual phonological acquisition, we are asking whether the phonological properties in bilingual children's speech can be related to frequent exposure to non-native and attrited speakers.

This study investigates the production of plosives in Dutch-German simultaneous bilingual children (3;6-6;0) and their sequential bilingual parents. Child productions were elicited in an interactive book reading task and a picture-naming game in both languages. Parental productions in L1 and L2 were elicited through picture naming. Ongoing data collection of a total of 33 bilingual children and their parents will be finished in August. Data will be analyzed using multilevel regression analysis, taking into account detailed measures of language exposure and speech perception.

The first results of ten bilingual children indicate that they differentiate their VOTs by language with overall shorter VOTs in Dutch than in German (β= 6.68, t=1.96, p<0.05), which shows that the bilinguals have separate systems for their languages. We further performed a phonetic analysis on the language input that they receive from their parents (n=17). Each parent is a native speaker of Dutch and a second language speaker of German or vice versa and they have been tested in both languages. The VOT of the bilingual children correlates with that of their non-native parent for the German voiced and voiceless plosives (β= 0.74, t=3.1, p<0.005) as well as for the Dutch voiceless plosives (Interaction between non-native parent and voicing: β=0.73, t=2.35, p< 0.05; post-hoc: Dutch voiceless: β= 0.96, t=2.456, p<0.05, Dutch voiced: β=-0.39, ns).

These results suggest that simultaneous bilingual children acquire language-specific phonological categories for each language that are influenced by the non-native speech to which they are frequently exposed.

Keywords: bilingual speech, speech acquisition, speech production, input, VOT

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Case studies of speech and language disorders in three children with ASD (Autism Spectrum Disorder)

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Speech and language deficits occur in a number of developmental disorders like ASD, ADHD, cerebral palsy, Down's syndrome, etc. Inadequate language is a defining feature in Autism Spectrum Disorder. This paper examined and described the patterns of speech and language deficits in three children with ASD. The characteristic features of children with ASD (like: behavior, repetitive actions (hand flapping), self-destruction (head banging), temper tantrums and melt downs, inadequate eye contact, sensitivity to touch and pain, etc.) vary according to whether they are diagnosed as mild/borderline, moderate or severe.

This paper examined the articulation and language disorders in three verbal children (aged between ten and thirteen years), diagnosed to be 'mild' 'moderate' and 'severe' cases of autism. This study of the deviant patterns in their speech looked at certain aspects of speech and language such as: substitution of sounds, for example: /r/ /w/ (with lip rounding). Substitution of the voiced alveolar non-lateral approximant with the voiced labio-velar semi-vowel, which is also an approximant to make articulations such as, /θwiː/, /dwes/, /kwaɪ/ and /gwiːn/ instead of /θriː/, /dres/, /kraɪ/ and /griːn/ respectively. Certain significant features were noted. It was possible to articulate /r/ when preceded by bilabial plosives /priːʧ, braɪd, brʌðə/ and when /r/ occurs word initially /red, rʌbə, raɪt, rəʊd/. The ability to articulate consonant clusters, addition of sounds, deletions / distortions / substitutions and omissions of sounds, clenched teeth articulation, echolalia, scripting, incomplete sentences, sentence structure, use of the pronoun, comprehension/expression, fluency, voice quality and the ability to convey emotion through intonation were also studied.

The study concluded with the differences and the commonalities that existed in their speech and language. It enabled the identification of sounds and sentence patterns that are abnormally produced and concluded that the deficits are greater in the child diagnosed as 'severe'. The findings of this study can help speech therapists design tailor made speech therapies for such children.

Keywords: ASD, speech and language disorders, speech therapies

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The impact of the critical period on reading and pronunciation in L2

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Bilingualism usually assumes a concomitant use of two languages with deep processing of thoughts. Simultaneous bilingualism is related to early childhood, while consecutive bilingualism can take place later. In monolinguals and bilinguals the time of lateralization is significant. So, the main biological limitation in linguistic achievements is the Critical Period, which influences speed of processing, pronunciation and syntax, and to a smaller degree semantics, pragmatics and vocabulary. The right hemisphere is more supportive in late bilinguals. But with automatisation of linguistic processes and prolonged exposure to the L2 the speed and linguistic processing improve.

Bilingualism was proved to have a positive impact on children's development, their enhanced executive control, selective attention, inhibiting irrelevant information and providing a cognitive reserve against decline in cognitive ageing. But while the main focus has usually been on natural bilinguals who live in an L2 environment and/or whose parents speak in two languages, my interest will be on artificial bilinguals who first learn L2 in school-like conditions and live in a monolingual environment.

Subjects used in the study are students and adults whose mother tongue is Polish (L1). The students started learning English (L2) at the age of 6 and adults later than 14. Both groups show similarities in terms of socio-economic status, motivation and education. The impact of the Critical Period was expected to be stronger in pronunciation than reading. Pronunciation was assessed after a short pronunciation test.

The reading task involved a judgement if a sentence - quotation or a metaphor in L1 and L2 - made sense. The last element in the sentence was underlined; this element was either the same as in the original sentence or it was changed deliberately so as the sentence did not make sense. A Special computerized programme was designed to measure the response time after reading each sentence and making a decision about the sense of the sentence. Polish and English sentences were matched and paired to their length. The reading part established whether early learners were more efficient readers than late learners.

The main goal of the research was to detect the abilities of becoming bilingual and maintaining L2 understanding and speaking (pronunciation) by late learners in a monolingual country. It is assumed that artificial bilingualism is as beneficial to mental processes as natural bilingualism. Artificial bilingualism deserves a higher position among scientists, as well as support and promotion in monolingual societies.

Keywords: artificial bilingualism, critical period, pronunciation, reading

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The transfer of negative doubling in the speech of Italo-Mexican bilinguals in Chipilo

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In standard Spanish, a negative sentence is formed by inserting a negative marker 'no' before a verb as in (1) *Yo **no** hablo italiano*/'I do not speak Italian'; the repetition of the same negative marker in postverbal position is ungrammatical. However, in Veneto (Northern Italian dialect) both markers are used: one preverbally and the second one at the end of the utterance, seen in (2) *Mi **no** parle talian **no***, similar to Portuguese Minero (Biberauer & Cyrino, 2009; Schwenter, 2006; Martínez, 2006). Thus, based on some sporadic observation from previous literature (Barnes, 2009; MacKay, 2002) and my preliminary results (Tararova, 2014), I hypothesized that there has been a transfer of the second negator as in (3) *Yo **no** hablo italiano **no*** from Veneto into Spanish in the speech of bilinguals in Chipilo, Mexico, who have preserved their minority language for over a century. For this project, 75 participants (aged 18-55+), classified into groups according to their sex, age and participants' parents' first language (bilingual Chipileños, mixed (one of the parents is Chipileño and the other one is a monolingual Mexican, monolingual Mexicans as controls), were recruited to do a preference perception production task (PPPT) and a repetition task (RT) to elicit the distribution of negative doubling (ND). Stimuli were controlled for the following linguistic factors: previous constituent, use of n-words and presupposition in discourse. A total number of 4800 tokens (excluding 2300 filters) were extracted and analyzed, resulting in 6% (267 cases) of ND. In terms of the tasks, the RT elicited predominantly higher number of cases of ND (16% (182 cases) in comparison to 5% (85 cases) in the PPPT). This suggests that participants' perception is different from their production, especially when the option of negative doubling is not given to them. In terms of the groups, there was no much difference (53% of ND in mixed groups in comparison to 47% in bilingual groups), which leads to suggest that the phenomenon is a case of stable variation. In terms of gender groups, more males (n=14, 15%) than females (n=9, 7%) favored the use of ND in the RT, and 33% of females (n=5) preferred ND in the PPPT in comparison to 37% of males (n=13). With regard to the linguistic variables, the highest rate of negation occurred with the verb as a previous constituent (62%). The type of the verb, however, did not play a role in the use of ND. The other variables, the use of n-words and presupposition in discourse were not strong predictors of ND presence. Based on these results, negative doubling appears to be in somewhat free variation, yet supporting the overall hypothesis about the transfer effects of minority language phenomenon on majority language use.

Keywords: negation, minority language maintenance, bilingual speech, transfer

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Investigating early language development in a bilectal context

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In the particular linguistic situation in Cyprus, the standard language (Standard Modern Greek) co-exists alongside the local dialect (Cypriot Greek); Greek-speaking infants raised in this linguistic community grow up as bilectals, acquiring two forms of the same language simultaneously. Early language development in such bilectal communities has received very little attention to date. This ongoing study is one of the few projects aiming to investigate language development in such contexts: It involves the Cypriot Greek adaptation of the MacArthur-Bates Communicative Development Inventory (CDI) (Taxitari, Grohmann and Kambanaros, forthcoming), a long checklist addressed to parents of small children in which parents report on different aspects of their child's language abilities.

CDI - II (Words and Sentences) is used for the collection of data and the standardization of the tool for five age groups (18, 21, 24, 27, and 30 months). The CDI consists of two parts: Part I investigates word production and word usage; it contains a list of words divided in 24 semantic categories. Both Standard Modern Greek and Cypriot Greek words are included in the list, and of special interest are *translation equivalents*, that is words with the same meaning but different lexical form in the two dialects. Part II investigates grammatical development; it contains six sub-sections with questions on the use of grammar, the formation of plural, verbs in different tenses, negation, nouns, adjectives, and combination of words. Along with questions on children's language abilities, different factors which might affect development are also being investigated, such as children's gender, parents' educational level, birth order of child in the family, and more.

Data for the child's expressive vocabulary are calculated by assigning one point to each word the child says, as reported by the parents. Total vocabulary scores are calculated by summing up the points for all words, and total conceptual vocabulary is calculated by subtracting, from total vocabulary scores, points from words occurring in both varieties (Cypriot Greek and Standard Modern Greek). Percentage scores are also calculated from both total and conceptual vocabulary scores.

In this presentation, the Cypriot Greek CDI is going to be introduced along with its use in investigating language development in bilectal contexts; emphasis will be placed on the use of translation equivalents in different stages in development. Preliminary data from the different age groups will be presented concerning different aspects of children's language development in Cyprus.

Keywords: lexical development, bilectal language acquisition, translation equivalents

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Why is Japanese pitch accent so difficult for English speakers?

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English words such as the noun *OBject* and the verb *obJECT* are distinguished by stress; Japanese words such as *haSHI* 'bridge' and *HAshi* 'chopsticks' are distinguished by pitch accent. Does English speakers' experience with stress help with acquiring pitch accent in Japanese? Or do the differences between stress and pitch accent make acquisition difficult? (Stress but not pitch accent affects duration, intensity and vowel quality; pitch accent is always realised with a pitch fall but the pitch shapes of stressed syllables are determined at phrase level.)

To investigate this, two groups of Standard Southern British English speaking learners of Japanese were studied: a less experienced group (n=13) who had completed up to two years of a Japanese degree, and a more experienced group (n=8) who had completed a four-year Japanese degree with a year in Japan. The learners read aloud 180 Japanese words, varying in syllable number, lexical class, and Standard Japanese accent type, in three contexts: in isolation (e.g., *ame* 'rain'); before a clitic (e.g., *ame da* 'it's rain'); and sentence initial (e.g., *ame ga furu* 'rain falls'). The contexts used were motivated by previous research (Yamada, 1994) and the words were expected to be known to the learners.

The accent types produced by the learners were identified by phonetically-trained Japanese native speakers. These showed a low match with Standard Japanese, regardless of experience (mean 43% SD 5), and were unstable: 80% of words changed accent type across contexts. These findings show that pitch accent is difficult for English speakers, presumably due to the differences between pitch accent and stress: pitch is not a correlate of stress in English.

The results also showed considerable inter-learner variation, not in the match with Standard Japanese, but in the proportion of each accent type produced, and in the relation between accent type and syllable number, lexical class and context. This fits with our understanding of language as a dynamic system (de Bot, Lowie, & Verspoor, 2007), where SLA processes such as L1 influence and implicit tallying result in individual learning paths. Longitudinal research is needed, as well as research investigating whether the difficulty is with perceiving pitch accent, representing it in the mental lexicon, producing it, or a combination of all of these.

Keywords: pronunciation, acquisition, prosody, L1 influence

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Morphophonological form and phonological awareness in the L2 oral production of Swahili

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There has been increasing interest in the variability of oral production and the second language (L2) acquisition of grammatical gender and number (Foote, 2015). Little research has been conducted outside of Germanic and Romance languages. The investigation of Swahili can expand our understanding of these features. The 18+ noun classes in Bantu languages are morphosyntactically the same phenomenon as gender in European languages. However, a key distinction is Swahili's alternative to biological gender: *mwanaume* (man) becomes *wanaume* (men), sharing the same prefixes as *mwanamke* (woman), its plural *wanawake,* and many animate nouns.

There are two research questions: (1) Can English-speaking L2 learners accurately mark gender on Swahili nouns as well as adjectives and numerals given that gender is not present in their L1? (2) Can English-speaking L2 learners accurately mark Swahili number? Previous research in European languages shows that English-speaking early L2 learners accurately mark number but are poorer at marking gender (White et al., 2004).

Spontaneous oral production data were gathered from 10 U.S.-based, English-speaking university learners of Swahili at beginning to advanced levels. The results indicate that gender marking is almost never incorrect/omitted on adjectives or verbs accompanying singular nouns, particularly animate nouns. These results are consistent with the experimental data of Spinner & Thomas (2014), and contrast with findings in L1 Sesotho as children frequently omit gender prefixes on nouns and verbs, but use adjective marking early (Demuth, 1985). L2 learners appear therefore to treat agreement on verbs and nouns as distinct from agreement marking on adjectives. For example, a non-Swahili word is re-analyzed by one learner as a class 9/10 (inanimate) noun. The learner produces /nk/, a consonant cluster not present in Swahili, in an overcompensation for the irregular noun. This suggests that the underlying morphophonology is understood, but sensitivity to phonological mismatches is missing. The example in (2) also supports this conclusion, as the prefixes of the adjective and its referent misalign.

(1)	*Michigan*	*si*	**n-kubwa*
	Michigan.9/10	be.not	9/10-big
	Michigan	is not	big

(2)	*Na*	*a-na*	*ma-sikio*	**m-kubwa*
	And	1-have	6-ear	3-big
	And	s/he has	ears	big

Consequently, I argue that these L2 learners do not parse gender prefixes on nouns as separate from the root. Rather, they interpret [singular/plural marker + root] as the root itself, despite instruction that clarifies this distinction. Findings are also discussed in light of current theories that take the absence of feature marking in production as evidence of syntactic deficiencies (e.g., Lardiere, 2008).

Keywords: morphophonology, agreement, L2 learners, grammatical gender, Swahili, noun class

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Self-efficacy and English listening skills: The case of Japanese college EFL learners

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Todaka (2013) examined the relationship between self-efficacy beliefs and English listening skills utilizing 101 Japanese college freshmen during the spring semester in 2012. Based upon an ANOVA analysis, the difference in scores between the pre- and post TOEIC tests was found to be significant at a 95% confidence level for the introductory level students ($p<.011$, $F=6.9$) and at a 99% confidence level ($p<.0001$, $F=19.34$) for the advanced students. In addition, high self-efficacy beliefs about their English listening skills were found during the post-test periods. As a follow-up investigation, Todaka (ibid.) examined the listening section (30 questions) of an EIKEN test taken during April in 2012 and January in 2013. 49 out of 53 advanced students took both tests, and a non-significant result was found ($p<96$, $F=.002$). 31 out of 48 introductory students took both tests, and a non-significant result was also found ($p<.08$, $F=.06$). Thus, the students in both groups made significant improvements by the end of the spring semester, but during the academic year (i.e. from April, 2012 to January, 2013) as a whole, their listening scores did not improve or worsened. It is hypothesized that the importance of concrete and specific study reasons have to be recognized by Japanese college EFL freshmen to appreciate the positive effects of self-efficacy beliefs on their English listening skills (Bandura, 1998; Locke & Latham, 1988). This is because most of them have lost their primary reason to study English, as their English study objective in high school was to pass college entrance examinations. Furthermore, Sirono (2004) investigated the efficacy of educational guidance on improving Japanese high school students' motivation. The objectives of our study were therefore twofold: (1) to examine if instruction focusing on the four sources of self-efficacy as well as re-establishment of students' concrete English study reasons can help Japanese EFL learners improve their English listening skills; and (2) to investigate if educational guidance sessions can help them sustain their self-efficacy beliefs about their English listening skills. We found that (1) the four sources of self-efficacy theory and re-establishment of concrete English study objectives helped our students improve their English listening skills throughout an academic year, and that (2) guidance counselling sessions helped our students sustain their perceived self-efficacy. However, it was found that more careful consideration for cultural effects on questionnaire items must be given in order to accurately assess Japanese EFL learners' perceived self-efficacy.

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Syllable duration in L1 and its impact on the prominence level in L2

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The correct production of contrast in prominence in a second language is challenging for the learners. Not only is there the placement of stress on the appropriate syllable in the word that has to be learned, but also features which are used to express such a contrast have to be acquired, and to what extent they are used. Such features can be based on the variation of sound intensity, segment and/or syllable length, presence of tonal accents and degree of articulatory precision. Furthermore, the level of prominence of several syllables in an utterance is not just twofold, but can be primary, secondary or tertiary.

When studying accented L2-speech of Swedish produced by L1-speakers of Albanian, it was not always clear which syllable in a word was carrying the highest level of stress. Therefore, one of the foreign accent features is not simply based on incorrect stress placement, but there is a need for further explanations. Observations from auditory analysis were that vowel quality reduction – as required in unstressed syllables in Swedish in most cases – was not carried out sufficiently. Visual inspection of the speech wave gave the impression that vowels seemed to be of similar length and at almost equal distance from each other, no matter if they were part of an anticipated stressed or unstressed syllable.

Based on these observations, the current contribution aims to give an account for similarities or dissimilarities in syllable length between Swedish and Albanian produced by L1-speakers and L2-Swedish produced by Albanian L1-speakers. Hereby, the approach taken includes the measurements of syllable duration of spontaneous and read speech and the calculation of the nPVI. If the observation presented above is correct, the nPVI for Albanian L1-speech would have a lower value – referring to a language which is more similar to a syllable-timed-language – than the nPVI for Swedish L1-speech, similar to what is referred to as stress-timed. The analysis of the nPVI carried out on L2-Swedish speech, produced by L1-speakers of Albanian will then be compared to the indices received from L1-speech. It is assumed, that the nPVI of L2-Swedish is closer in value to the nPVI of L1-Albanian than to the nPVI of L1-speakers' Swedish. The analysis of read speech is added here to rule out that the above stated observations were merely based on an artefact. Such an artefact could have been caused by the rather unnatural situation of language production when reading - when the subject's attention is drawn to the text and effort is made to reproduce the text as clearly as possible.

Keywords: foreign accent, L2-prosody, stress systems, prominence levels, nPVI, syllable duration

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Functional aspects of Japanese liquid acquisition

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It has been pointed out that Japanese 'r' is acquired quite late and the substitution 'errors' are labeled as rhotacism. Typically, target 'r' is replaced by 'd' as in (1).

(1)

Phonetics forms	Target forms	Gloss
disɯ	ɾisɯ	squirrel
soda	soɾa	sky

This type of rhotacism is analyzed under Optimality Theory (Ueda & Davis, 2001), who claim that in this stage a constraint *r-onset which disallows the target 'r' to surface in the syllable-onset position outranks a faithfulness constraint which promotes the input to appear as it is. In the course of development, *r-onset is getting demoted until the input form emerges. Though this analysis looks plausible from a formal viewpoint, it may fail to capture one important fact: in some cases target 'r' does not emerge across-the-board but it diffuses into lexicon word by word. Note that target 'r', according to the analysis, has to emerge in all lexical items containing the target quickly after the reranking.

The slow emergence of target 'r' invites us to examine functional factors pertinent to acquisition in general, which were first recognized in Fukusako, Sawashima, & Abe (1976). They argue that misarticulators are divided into fast/good learners and slow/poor learners depending on functional factors. Based on their observation, Ueda (2005) discusses that misarticulation should be considered not only on formal principles but on functional grounds. The four functional aspects argued in Ueda (2005) are (1) time length for the target to emerge (2) emergence of the target without instruction or treatment (3) generalization learning and (4) stability of substitution. For fast/good learners, the length of time for acquisition is relatively short; the emergence of the target can take place without instruction or treatment; generalization learning is also possible; they exhibit consistent substitution. On the contrary, slow/poor learners need relatively long time for the target to appear; the target does not always emerge without being trained; generalization learning is impossible; substitution of the target is inconsistent. These aspects reveal a qualitative difference in the phonological knowledge between the two groups of learners.

Among the four points, the most noteworthy is stability of substitution. See the inconsistent substitution of a child in (2).

(2)

Phonetics forms	Target forms	Gloss
disɯ/jisɯ	ɾisɯ	squirrel
soda/soɰa/soʔa	soɾa	sky

From a clinical perspective, we can predict that this child will need a long span of time before he acquires the target. Moreover, the functional difference is expected to provide us with a clue to the phonological system of the child, in which the input itself may be different from that of adults (with or without non-adult-like constraint ranking).

Keywords: rhotacism, phonological theory, phonological knowledge, functional factors

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An acoustic study of Japanese pitch accent produced by Italian speakers of L2 Japanese

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The effect of L1 characteristics on L2 speech has been investigated extensively at the segmental level, and the most important models of L2 speech learning (e.g., the Speech Learning Model - Flege, 1995, 2002, and the Perception Assimilation Model - Best, 1995; Best & Tyler, 2002) have been mostly developed on the basis of segmental data. Recently, more effort has been dedicated to investigating prosodic aspects of L2 speech, both to re-evaluate the aforementioned models in the light of prosody, and to develop full-fledged L2 prosody learning models (Mennen, to appear).

To reach one of the main goals in L2 prosody research, which is to understand how L1 prosodic features affect L2 prosodic patterns (i.e. *prosodic transfer*), it is useful to compare transfer patterns of multiple L2 types within the same research framework, combining languages that differ typologically in prosodic features such as timing types (stress-, syllable- and mora-timing). The distribution of relative prominence is considered to be one of the major factors that characterize timing types (Arvaniti, 2009). Languages differ not only in the distribution of word accent/stress (word accent, henceforth) but also in the treatment of acoustic correlates of word accent production. For example, in English, all three acoustic correlates (duration, F0, amplitude) are actively involved, while only F0 is active in Japanese (see Beckman, 1986 for a review). In Italian, the only stable correlate is duration (Bertinetto, 1980, 1981). When two of these three languages are combined as L1 and L2, how do the L1 phonetic habits affect L2 word accent production? Ueyama (2000) investigated L2 English-L1 Japanese and L2 Japanese-L1 English, finding the following generalizations: 1) the transfer patterns of L1 prosodic features can vary greatly from correlate to correlate; 2) different transfer patterns in learner's production can be explained by differences in the phonological status of a prosodic feature in L1 vs. L2.

In light of these findings, the present work investigates L2 Japanese-L1 Italian with the experimental method of Ueyama's earlier study. We collected production data of four speaker groups: L1 Japanese, L1 Italian, L2 Japanese-L1 Italian at beginning and intermediate levels. F0 and duration values were measured and analyzed. A pilot analysis confirms that F0 is the only robust correlate in L1 Japanese, duration in L1 Italian. The same L1 Italian pattern is observed in beginning L2 Japanese, while intermediate learners show patterns closer to L1 Japanese, reducing the duration contrast and increasing the F0 one. We will also discuss notable differences between L2 Japanese-L1 Italian and L2 Japanese-L1 English in transfer patterns, which reflect differences between L1 Italian and L1 English in terms of the relative importance of F0 and duration.

Keywords: L2 speech, prosody, word accent, speech production, L2 Japanese-L1 Italian

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Segments and prosody and variation

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The perceived impression that a spoken utterance is not native is due to the culmination of a combination of segmental and suprasegmental phonological and phonetic characteristics entrenched in the speakers native language (L1). It also results from different types of interplay between those characteristics of the L1 and the second (or foreign) language (L2). German L2 utterances produced by native speakers of American English (AmE) of different proficiency levels are analysed in order to gain insight into the interaction of several segmental and prosodic characteristics that are different in the two languages at hand and to identify developmental patterns in the acquisition of L2 speech.

The approach of the Dynamic System Theory (DST) is adopted in a detailed phonetic analysis. Previous findings suggest that the mastery of segmental and prosodic characteristics interacts in the acquisition process. In a perception study of German native speakers of L2 English a correspondence of segments and prosody was observed on the basis of FA ratings obtained from native speakers of English in that prosody was found to influence the degree of perceived FA only when corresponding with the perceived FA on the segmental level (Ulbrich & Mennen, 2015).

The speech material used consists of a set of nonce words (1) to be produced in isolation and (2) to be inserted into a visually presented context. The nonce words were three-syllabic with a constant /CV:CV:CV:/ syllable structure respectively. The three-syllabic words were introduced as names of locations, such as a castle, a parc, a lake etc. We used voiced consonants to make sure that a continuous intonation contour can be produced in order to allow for the observation of prosodic characteristics. Stimuli were created in order to contain segmental obstacles, i.e. /r/ fricative realisation in German as opposed to the /r/ approximant as produced in AmE. Produced in a carrier sentence they were placed into positions that allow for the elicitation of specific pitch patterns according to requirements of the information structure, namely the continuation rise and the nuclear accent pattern.

The results show that the mastery of segments and prosody is not a progression of one and the other but rather that the mastery of individual characteristics of either level follows a structured sequence as predicted under the assumption of language learning as a self-organising dynamic process. The results are best interpreted in adaptation of the framework of the Dynamic Systems Theory.

Keywords: second language acquisition, prosody, segments, production, foreign accent

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Can L2 prune L1?

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Phonological knowledge of a language involves knowledge about segment combinations. Languages vary in the quantity and quality of licensed combinations (Norris et al., 1997). The present paper concentrates on the sonority sequencing in final consonant clusters. We report results on a two-session experiment in which two groups of Polish-speaking participants, a monolingual group and second language speakers of German, had to learn nonce words of a CVCC syllable structure in order to gain insight into the influence of a second language (L2) on a first language (L1). Whilst both, Polish and German are phonotactically elaborate, they differ in their adherence to the phonotactic principle of sonority in the actual language use. Polish and German are languages with a large inventory of final consonant clusters but they differ in the existence of phonotactic violations, i.e. in violations of the sonority sequencing as by far less frequent compared to Polish. We are interested in the question whether a phonotactically more restricted L2 (German) can prune the L1 (Polish) system, hence if learners of the more restricted L2 become sensitised towards phonotactic violations in their L1. The present paper thus aims to contribute to the debate about universal and languages-specific phonotactic constraints by examining the electrophysiological responses to two factors which determine the appearance of consonant clusters, namely the sonority sequencing of the clusters as well as their existence or non-existence. The two factors play an important role in the current debate between opposing theoretical frameworks of Universal Grammar (Chomsky & Halle, 1968) and usage-based approaches (MacWhinney, 1999). Previous studies have shown that licit and illicit words and nonce words are learned and processed differently (Berent et al., 2014; Chambers et al., 2010; Domahs et al., 2009). Making use of an artificial language paradigm, we constructed nonce words with existent and non-existent Polish final consonant clusters adhering to or violating the sonority sequencing principle. Behavioural data and event-related brain potentials (ERP) in response to these cluster properties were obtained twice, during the process of learning word-picture-pairs (WPPs). The results show that overall nonce-words can be learned after relative short exposure by all participants. The behavioural data and EEG responses reveal that learning of final consonant clusters is facilitated by adherence to the sonority hierarchy, however more so in the L2 German learners groups in that they learned WPPs with clusters adhering to sonority principles more successfully than the monolingual group. In addition we found electrophysiological evidence for the influence of the L2 restrictions on sonority. A more pronounced early negativity for clusters violating sonority in the L2 learners group indicated that the use of L2 restrictions influences the processing of L1.

Keywords: sonority, L2 influence, EEG, phonotactics

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VOT in simultaneous bilinguals and advanced German L2 learners of French

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Many recent studies have been concerned with the end state grammars of early bilinguals (2L1s), in particular heritage speakers. In spite of their early exposure to the languages, heritage speakers do not exhibit monolingual-like systems in all respects, thus resembling (advanced) second language (L2) learners (Montrul, 2008). Evidence from phonology is controversial though. Phonology is thought to be well preserved compared to other areas of language (Benmamoun et al., 2013), but heritage speakers still often end up having a foreign accent in their minority language (Oh et al., 2003). In this study, we add novel data to the discussion, comparing 2L1 and L2 learners of French who (also) speak German. We focus on VOT realization in the velar stop /k/, which in French is a short-lag stop (VOT ~20-30 ms), and in German is a long-lag stop (VOT ~60-80 ms). Cross-linguistic influence could thus emerge as VOT differences between 2L1s, L2s and monolinguals (L1s).

We analyzed data from semi-structured interviews and guided narratives from ten adult L2s, seven 2L1s who grew up in France, another seven who grew up in Germany, and five L1s. A total of 2515 words with /k/ in initial position were selected and analysed using mixed-effects regression. Our main aim was to establish how well these different learner groups were able to realize a native-like VOT. In addition, we investigated possible predictors (e.g., language of childhood, country of residence) that could correlate with the realization of VOT.

The predicted VOT for the L1 group was 42 ms. In both 2L1 groups, VOT was approximately 8 ms shorter than in the L1 group, while in the L2 group, it was approximately 5 ms longer. Furthermore, VOT increased by 22 ms when /k/ was followed by a high vowel instead of a low vowel. There were no significant effects of country of residence or childhood language. In other words, the 2L1 groups produced short, French-like VOT, while the L2s produced longer German-like VOT. The estimated VOT in the L1 group was longer than expected, presumably as a consequence of the recording setting. We consider this latter observation to be of methodological importance. We conclude that 2L1s can acquire and maintain a native-like VOT system, even in their minority language, having advantage over late L2s. Finally, we recommend that VOT, being a variable measure, be studied carefully to allow for comparison across experiments.

Keywords: Voice Onset Time (VOT), heritage language, cross-linguistic influence, second language acquisition, ultimate attainment, French, German.

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The effect of age of onset on long-term attainment of English (FL) pronunciation in instructional settings in Spain

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Beginning in the late 1990s, the starting age for FL learning in Spain was progressively moved to the beginning of primary education and to preschool (Morales Gálvez et al., 2000), assuming that the earlier you start a foreign language, the better you will acquire it.

The theoretical foundation that seems to support this assumption is the Critical Period Hypothesis (Lenneberg, 1967), which posits the existence of a threshold age after which starting to learn a language will never lead to full competence. A less categorical version of this hypothesis conceives of sensitive periods for different aspects of language (Long, 2013) with gradual offsets rather than abrupt discontinuities. Both versions have remained controversial (see for example, White & Genesee, 1996; Birdsong, 2005)

There is some agreement that a critical or sensitive period exists on the phonological level, probably caused by a change of perception, which becomes increasingly categorical while the structure of the L1 phonemic system is acquired (e.g., Ioup, 2008).

In instructional settings in Spain, some findings appear to qualify this view. A large-scale research (the Barcelona Age Factor project) suggests long-term phonological advantages for very young starters on the level of perception but not for pronunciation (Fullana, 2006). However, the youngest starting age in the project was 8, while some researchers assume the age span during which perception changes to be between 5 and 7 (e.g., Flege, 1995). It would, thus, be interesting to observe if the earlier starting age in the current Spanish school system might have any significant effect on long-term attainment of English pronunciation. To do so, we recorded the speech of 20 adult Spanish speakers, 10 of whom had started to learn English at preschool while the rest had done so at the age of 8 or later, all other variables being equal. The speech was analysed for accuracy. The early starters achieved an average rate of 1,8 errors per 100 words (while the later starters achieved 7,2, which is 4 times higher). The results suggest that starting to learn English at preschool has a significant effect on long-term attainment of pronunciation in a Spanish instructional context.

Keywords: sensitive periods, long-term attainment, pronunciation

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One system or two? Relating developmental bilingualism to adult models

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Do bilingual children begin with one system or two? The question has generated controversy for over 30 years, with regards to phonology, lexicon and morphosyntax (e.g., Volterra & Taeschner, 1978; Paradis & Genesee, 1996; Meisel, 2001; De Houwer, 2005). The dominant view, proposing two systems from the start but with interaction (e.g., Lleó & Kehoe, 2002), seems difficult if not impossible to test empirically. The interaction may instead be taken to reflect a thoroughgoing linkage of the two systems in development, less constrained but not unlike what has been proposed for models of adult bilingual speech production since de Bot (1992).

For phonology (production), Vihman (2002, in press) proposes that once a child has produced 10-20 words, one or more preferred word patterns or templates may be abstracted from the existing forms and applied to more challenging adult targets (Vihman & Croft, 2007), initiating the first systematic organization. Prosodic structures may differ but templates assimilate words from both languages, as in (1), where a <VC:V> pattern, not unusual for Estonian with its medial geminates, is extended to English words: (1) K, 1;5: Est. *auto* [at:o], 1;7: Eng. *monkey* [ak:i].

Similarly, early code-switching reveals child insertion of the non-discourse language in ways seldom seen in adults (Vihman, 1998) – e.g., (2): R, 3;4 *Miks on UNDER PINK?* 'Why is [it] PINK UNDERneath?, with word order deriving from the Estonian expression, *Miks on alt roosa?* 'Why is under-from pink?' despite the mid-clausal lexical switch to English.

Such data, like the cross-linguistic use of templates, suggest an extended period of cross-talk between the network of associations for each language and those linking the two while the lexicon and the grammar of each language gradually stabilize and become more reliably accessible. Furthermore, experimental studies (e.g., Kootstra et al., 2012) as well as anecdotal evidence from cross-linguistic speech errors in adults support the view that, throughout the lifespan, unconscious processing draws on both languages, with parallel activation of linguistic networks in the course of processing even when only one language is required. This suggests that it may be misguided to conceptualize children as restricting themselves to 'two separate systems from the start', given that this is not our best current understanding of bilingual processing in the adult.

Keywords: phonological template, code-switching, bilingual acquisition

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Developmental differences in code-switching: Double marking and transference in bilingual children's speech

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This paper draws on naturalistic, developmental code-switching data from bilingual children to raise two questions for theoretical approaches: 1. Is the Matrix Language Frame (Myers-Scotton, 2002) always a valid framework for analysing bilingual utterances? 2. How different are constraints on children's and adults' code-switching (CS)? The data come from two children bilingual in Estonian and English (ages 2;10-4;7 and 6;6-8;3), and consist primarily of 600 diary entries. The languages differ typologically in important ways, including the marking of syntactic and oblique relations (agglutinative-fusional Estonian contrasting with more analytic English). The data examined here include double marking (DM, 1) and syntactic transference (2).

1. a. when I grow up and go **to *töö-le*** (=when I grow up and go **to work)** 3;5.1
   work-allative
   b. you don't have **to *õmmel-da*** anything, but… it *aja*-s all the *paha-d* things away 3;9.14
   sew-infinitive drive-3sg bad-nom.pl
   c. the ***sääs-e***'s wings are one color (=the **mosquito**'s wings are one color) 4;0.7
   mosquito-genitive
2. a. ***pääsuke*** like this is done (=this is how the 'swallow' pose is done) 7;5.4
   swallow
   b. the tooth fairy… takes your tooth **from out under your pillow** 3;3.14
   c. how did you do ***sohk-i***? (=how did you cheat?) 7;6.5
   cheating-partitive

DM can be seen in (1a-b), with complementary locations for the markers, and (1c), with stacked inflections. Whereas the System Morpheme Principle allows DM only with early system morphemes (Myers-Scotton & Jake, 2000), the data here includes DM on object-marking cases, infinitives and plural adjectives. DM with late outsider system morphemes is problematic both for the 4-M model and for determining the base code of the utterance. Blended matrices, with effects on word order (2a), auxiliary choice, preposition selection (2b) and object marking (2c), further complicate the identification of a matrix language. On the other hand, allowing for composite MLF's and "bi-level" morphemes (cf. Bolonyai, 2000) makes the model unfalsifiable and robs it of some predictive power. The data point to developmental factors affecting code-switching, in addition to more general factors like language dominance, context and semantic specificity. For balanced bilingual children, syntactic transference may be more common than in adult data. Networks of relationships play an important role in online language production. A view that allows for constant interaction between the languages of a bilingual (De Bot, 2004; Vihman, in press) may be more felicitous than slot and frame approaches. The ways in which young bilinguals blend structures helps reveal the extent of interaction in two emergent systems.

Keywords: code-switching, double marking, syntactic transference, bilingual acquisition

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Russian-English intonation contact: Pragmatic consequences of formal similarities

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One of the aims of the article is to draw attention to the all-important role of prosodic interference, which can be both intra- and inter-language. Formal similarities of intonation patterns in different languages may lead to erroneous conclusions regarding their functional sameness and lead to miscomprehension and miscommunication.

As far as Russian question and non-final intonation is concerned, the rise-fall is the most typical one, which in the intonation system of Russian belongs to the group of rising tones. Observations over real speech behavior of Russian speakers show that some features, characterizing rising-falling intonation typical for these types of utterances - namely, late F0 timing - may be attributed to younger generation of Russian speakers only. The consequence is their misinterpretation by speakers of an older generation: neutral messages are often perceived as having a markedly negative overtone and therefore expressing attitudes not intended by the speaker and not immediately pleasant to the hearer.

Rising-falling intonation contours for yes-no questions and non-final units, most frequent in standard spoken Russian have always been considered specifically Russian, but in some northern English dialects rising-falling intonation is used in neutral discourse. At the same time, in southern RP English, it is always associated with an attitudinal/emotional overtone. This case of the intra-language inter-dialectal interference remains to be studied both from a phonetic and functional point of view.

In the situation of L1-L2 contact, at least as far as rising-falling intonation is concerned, a Russian learner of English may not have difficulty trying to produce a target language rising-falling intonation pattern due to their formal similarity in both languages, but he is sure to have difficulty receptively, when trying to analyze the meaning of a given intonation contour. On the other hand, native English speakers may also fail to interpret the message and intention of the Russian speaker correctly. Formal similarities of L1-L2 intonation patterns do not always imply the possibility of their transfer.

Keywords: L1-L2 contact, intonation, interference

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Specific language impairment in Greek Pontians from the former Soviet Union

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Language minority children worldwide are over-represented in special education, mainly in learning disabilities (LD), due to difficulties they experience in the use of the native language (Artiles, 1994). In Greece a large group of language minority children are the Greek Pontians from the former Soviet Union (FSU) (Institute for the Greek Diaspora and Intercultural Studies, 2009) who encounter serious language barriers since their insufficient knowledge of the Greek instructional language comprises the basic reason behind their low school achievement (Motti-Stefanidi, Takis, Pavlopoulos, & Masten, 2008). These children are considered as learning disabled by their teachers, although in the Greek special educational system the official identification of a child as learning disabled is based on the ability-achievement discrepancy model (National Joint Committee on Learning Disabilities, 2006). The aim of this research was to investigate if Greek FSU-Pontian primary school children with low achievement in language courses have specific language impairment (SLI) and if the profile of these children as regards their language acquisition competence and their language achievement differs from that of Greek classmates with the same disabilities. Children's learning ability was assessed with the Greek standardization of DTLA-P:4, which provides general learning aptitude quotient (GlearnAQ) and estimates LD profiles (Tzouriadou et al., 2008). Children's language competence was assessed with Λ-α-Τ-ω language acquisition test, which measures acquisition process in reception, organization and expression language composites and provides general language acquisition quotient (GLAQ) (Tzouriadou et al., 2008, b). For language achievement, a curriculum based assessment was used, which was developed by the researchers. According to class- teachers, three hundred and forty eight (348) Greek and Greek FSU-Pontian children were identified as low language achievers and this group constituted the initial research sample. To differentiate SLI group of children a GlearnAQ and a GLAQ of >85, an SD of 10-3 between the verbal-reduced and the verbal-enhanced DTLA-P:4 composites and an SD of 15-3 between GlearnAQ and GLAQ were used. Twenty-five (25) Greek and twenty-two (22) Greek FSU-Pontian children were identified as SLI. It was found that SLI children, either Greek or Greek FSU-Pontian, formed a distinct group of specific developmental disorders as a result of the interaction between their deficiencies and a variety of environmental factors (Catts & Kamhi, 2005). Also Greek FSU-Pontian SLI children scored lower in GLAQ, in reception language composite and grammatical modality of the language than Greek SLI children; their language achievement was also lower than that of their Greek classmates, but not statistically significant. This finding points out that the status of the Greek FSU-Pontian language minority SLI children has a negative impact on their language acquisition competence. This urges for the need to implement a different pedagogical approach for language minority children.

Keywords: language minority children, LD, SLI, aptitude-achievement discrepancy, language acquisition competence, language achievement

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Pronunciation and prosody in French learners of German

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Pronunciation of a second language (L2) depends on the phonological system of the mother tongue (L1). The phonology and prosody of French and German differ in terms of word stress as well as vowel and consonant systems (Zimmerer, Jugler, Andreeva, Mobius, & Trouvain, 2014; Gendrot & Adda-Decker, 2005). French learners of German (FL) have to adapt to new phonological and prosodic patterns to be readily understood by German native speakers (GN). In the present study we investigate how French as an L1 affects the pronunciation and the prosody of German speech.

A German speech corpus with GN and FL: 10 women, 10 men in each group, was recorded. The participants had to perform three tasks: reading aloud, oral repetition of spoken utterances and oral description of an image. The recorded speech was automatically aligned by the MAUS web-service. Acoustic analyses were conducted on the speech corpus using PRAAT. Statistical analyses were conducted by using the R program.

As expected, global phoneme durations are longer for L2 speakers. The realisation of the aspirated h, /h/, in an initial word position depends on the task FL have to accomplish. FL perform best in the repetition task and obtain the lowest score in the description task. Long and short vowels in stressed word positions of monosyllabic and disyllabic words, e.g., *prahlen* ['praːlən] (to boast) and *prallen* ['pralən] (to bump), show different F0 and formant values for the phonemes /eː/ and /ɛ/, /aː/ and /a/, /iː/ and /ɪ/, and /oː/ and /ɔ/ between GN and FL. The values obtained for the GN are concordant with the literature (Gendrot & Adda-Decker, 2005), e.g., our data show the vowel /eː/ with F1=402-411HZ, F2=2408-2468HZ and the vowel /ɛ/ with F1=624-626HZ, F2=2016-2070,5HZ for female speakers. FL differentiate long and short vowels in stressed word position, mainly though durational changes. As suggested in the literature (Féry, 1993), GN indicate the position of word stress by increasing the stressed syllable's duration and F0, in contact to stressed syllables. FL show the same durational patterns for stressed and unstressed syllables as GN. However, their F0 contours equate to those observed for French words (Schwab, Avanzi, Goldman, Montchaud, & Racine, 2012).

We can summarise three findings: the realization of the aspirated h in an initial word position is task dependent. FL distinguish short and long vowels in stressed syllables, yet, these vowels' acoustics properties are distinct from those produced by the GN. Finally, FL mark lexical stress in words using duration alone, whereas F0 contours are similar to French words.

Keywords: speech corpus, pronunciation, prosody, language learning, German - French

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What accounts for phonetic performance in a third language? A correlational study

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It has been indicated that the acquisition of third language (L3) phonology is an understudied domain which deserves special attention in scientific investigations (Cabrelli Amaro, 2013; Wrembel, 2015). This contribution presents the results of three selected measures of phonetic performance in L3 including ratings of perceived global foreign accent, acoustic measurements of voice onset time (VOT) and codification of metaphonological awareness. Conducted parallel studies involved two groups with different language repertoires (i.e. L1 Polish, L2 English, L3 French vs. L1 Polish, L2 English, L3 German). The multilingual participants included 60 adult Polish learners with advanced knowledge of L2 English (B2/C1) and elementary to intermediate proficiency in their respective third languages (A1-B1), with 30 participants per each group.

In the first part of the study L3 pronunciation performance was assessed by means of perceptual ratings involving three components: foreign accentedness, comprehensibility and pronunciation accuracy judgements. The conducted online survey included 20 raters who evaluated samples of read L3 speech on 7-point Likert scales. Secondly, acoustic measurements of VOT of stressed onset plosives elicited through target words read in carrier phrases in participants' L1, L2 and L3 were performed. The major objective was to explore sources of cross-linguistic influence (CLI) in the acquisition of L3 VOT patterns in comparison to VOT values in the remaining languages. Finally, metaphonological awareness was investigated through the application of stimulated recall verbal protocols, in which the participants were to modify and comment on their L3 pronunciation after listening to excerpts of their text reading recording. The protocols were audio-recorded, transcribed and coded for the purpose of the objectivisation using a specially designed coding system (Wrembel, 2014). A composite measure of metaphonological awareness was calculated on the basis of observed self-repair of L3 pronunciation, performed phonetic analysis and metacognitive comments on cross-linguistic interactions.

The findings showed intricate patterns of correlations between the participants' composite measures of metaphonological awareness, rated foreign accentedness and VOT values. On the whole, the participants with higher levels of awareness were perceived as less accented, more intelligible and accurate in terms of their L3 pronunciation performance. The L3 VOT values were found to be intermediate between L1, L2 and target values, pointing to a combined native and non-native language influence. Moreover, significant moderate to strong correlations between L3 phonetic performance and external factors were found for several variables including years of formal training in L3, age of onset and L3 proficiency. The analysis aimed at comparing L3 phonetic performance on three selected measures in different language pairings to gain a more comprehensive understanding of L3 phonological acquisition.

Keywords: L3 phonology, accent ratings, VOT, metalinguistic awareness

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Do early bilinguals speak differently than their monolingual peers? Phonological performance of Polish-English bilingual children

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It is a common belief that speech production of early bilinguals is similar to that of their monolingual peers and that these bilinguals speak both languages without a foreign accent. While some studies suggest that this is indeed the case and that bilinguals are similar in their phonological development to monolinguals (cf. Holm & Dodd, 1999), others show considerable differences when it comes to speech production (e.g., En et al., 2014; Mayr et al., 2015). In the present contribution we examined if the speech of early bilinguals in their chronologically first language differs from that of monolinguals and if it is prone to foreign-accentedness. To this end, we analysed Polish speech samples of 59 Polish-English bilingual children (mean age 5;9) of Polish immigrants to the UK and compared them with speech samples of 24 Polish monolinguals matched for age and socio-economic status. All bilingual children were exposed to Polish from birth and spoke this language at home with their families. Nevertheless, we hypothesised that bilingualism would affect their overall phonological performance in Polish and that their speech would be characterised by phonological cross-linguistic influence (CLI) from English.

Speech sample recordings came from a database collected by the Bi-SLI-Poland project within the European COST Action IS0804 with the use of the Polish *Sentence Repetition Task* (Banasik et al., 2011). In the data collection session the participants repeated 68 sentences that they heard through the headphones. For each child 14 preselected sentences were subsequently analysed auditorily by three phonetically trained raters. The raters were unaware whether they assessed a bilingual or a monolingual speech sample. The measures of phonological performance included: (1) the overall number of speech errors, (2) the assessment of CLI in twelve selected problem areas, i.e. features and processes potentially susceptible to transfer from English, and (3) the overall phonological performance, which was the sum of all the assessment points for CLI. As predicted, significant differences were found between the phonological performance of Polish-English bilinguals vs. Polish monolingual controls in all three performance measures. Bilinguals' made on average more speech errors than their monolingual peers (M=26.5 errors in bilinguals vs. 7.0 in monolinguals, difference statistically significant at $p < 0.001$) and their performance was assessed as affected by CLI from English. These results indicate that early bilinguals can differ in their speech productions from monolinguals and they can exhibit traces of foreign accentedness even in a language to which they have been exposed from birth.

Keywords: early bilinguals, phonological performance, cross-linguistic influence

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Can caregivers facilitate the acquisition of language-specific segment-duration patterns in children's speech?

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There is a paucity of data concerning caregivers' modeling and children's acquisition of language-specific speech timing patterns in diverse language communities. What is unclear is whether mothers' apply a teaching/modeling strategy when training their children to acquire durational properties of speech segments. This study set out to explore the role of modeling in teaching language-specific speech timing patterns to children.

The aim of this investigation was to map out the durational characteristics of mothers' speech modeling and their children's speech timing acquisition processes as reflected by the production of V2/V1 ratios in $C_1V_1(:)C_1V_1(:)$ structured words. Vowel duration patterns in caregivers' and their children speech were examined to identify caregivers' potential strategies in speech modeling when talking to their children at different ages.

Data were selected from 8 monolingual dyads speaking the standard dialect of Hungarian. The children were between 2;0 and 4;0 years old. Mothers were instructed to produce $C_1V_1(:)C_1V_1(:)$ structured words (e.g., /pipi/, /pi:pi:/) that served as puppet names while making up their own story with the puppets during free play with their children. The words were modeled multiple times by mothers to elicit the production of the target token from their children. Digitized recordings were obtained by using the "SoundForge" (version 5.0, Built 117) acoustic software. Tokens were selected from continuous speech samples using the "Praat" acoustic software (Version 5.4.04, 32 bit edition). The "Praat" program was used for the acoustic analyses.Vowel duration was measured by inspecting both the spectrogram and wave form of each token. Vowel duration values were recorded in milliseconds.Vowel length ratios (V2/V1) were computed for each word. Reliability measures on 10% of the data set showed inter-judge agreement that exceeded 98%. Binary logistic regression was applied to analyze the data.

Results suggest that timing patterns in caregivers' speech resemble a reciprocal play activity that is guided by the speech perception measures identified by the caregivers in the child's speech. Mothers actively manipulate their own vowel duration ratios to guide their children towards the production of increasingly adult-like vowel duration ratios. These findings may one day be used for planning out treatment approaches to remediate non-language-specific speech timing patterns in patients with various speech disorders.

Keywords: speech, modeling, acquisition, vowels, duration, caregivers, children

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Phonetic and phonological acquisition in Persian speaking children

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Persian language (also known as Farsi) is a member of the Western Iranian branch of the Indo-Iranian family within the Indo-European language family. It is the official language of Iran, Afghanistan and Tajikistan, and it is also widely spoken in some other countries, such as India, Bahrain, and among immigrants in Europe, US, and the Pacific countries. There are various accents of the Persian language spoken in Iran and in other Persian speaking countries. The present study focused on the Persian language spoken widely in Tehran. The sound system of the Persian language (sometimes known as formal Persian) contains 23 consonant, 6 vowels and 2 diphthongs. This study aimed to answer 3 main questions in Persian speaking children: (1) What are the ages for normative acquisition and mastery for each phoneme? (2) What is the percentage of consonant, vowel and phoneme correct? (3)What phonological processes can be seen?

The samples were gathered from 387 children aged between 3-6 years old using a 27 singleword picture-naming articulation test for the consonant acquisition study and 54 single word picture naming phonological test for the phonology study. Results revealed that all participants acquired all 23consonants and six vowels and two diphthongs by age 3;0 based on the 75% criterion in two positions (syllable initial and syllable final) and mastered all Persian phonemes by age 3;6, except /s/,/z/, /ʒ/, and /r/ with at the 90% criterion in two positions (syllable initial and syllable final). /ʒ/ and /r/ were mastered by age 3;11; /s/ and /z/ were mastered by age 4;6. By age 6;00, children produced 94.57% of consonants correct, the percent of vowel correct was 99.8% of vowels correct and the percent of phoneme correct was 96.3% of phonemes correct.

By age 3;00, syllable deletion, consonant and vowel assimilation had disappeared. Between ages 3-4, there was a major decline in the following processes: gliding, affrication, deaffrication, prevocalic voicing, vowel substitution, metathesis, stopping. Between ages 4-5, the following processes were declining: final consonant deletion and fronting. The following phonological processes were attributed to atypical production because they weren't seen (found) in any group of children at more than 10%: backing, initial consonant deletion, insertion, sound preference, gemination, degemination, nasalization, denasalization, and deletion of more than two syllables. These findings seem to provide useful information for speech-language pathologists for assessing Persian speaking children and designing treatment objectives in Persian.

Keywords: acquisition, Persian, phonological process, percent correct, consonant, vowel

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