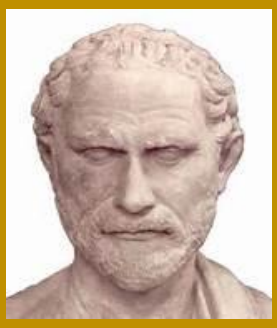

Proceedings of the International Symposium on Monolingual and Bilingual Speech 2022

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Editor
Department of Communicative Disorders
College of Liberal Arts

University of Louisiana at Lafayette

PROCEEDINGS OF THE INTERNATIONAL SYMPOSIUM ON MONOLINGUAL AND BILINGUAL SPEECH 2022

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FOREWORD

The Proceedings contain papers selected from those presented at the International Symposium on Monolingual and Bilingual Speech (ISMBS) 2022 which took place at the Department of Communicative Disorders of the College of Liberal Arts, University of Louisiana at Lafayette on 6-9 April 2022. The Symposium sprang from yearning for a specialized conference on speech that cuts across dividing boundaries between language subfields: first language, second language, bilingual, multilingual; child or adult; typical or impaired. ISMBS encourages investigations that go to the heart of matters, widening existing horizons and perspectives, kindling a holistic viewpoint, fostering collaborations across the board and, ultimately, sparking innovative thought and approaches. Participant affiliations covered thirty-three countries in Europe, North and South America, Asia, and Australiasia. Special issues of the Journal of Monolingual and Bilingual Speech (Equinox Publishing) that include papers presented at ISMBS 2022 are under preparation.

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English time at Núcleo Saber Down: Study on adaptation of codas filled with occlusive consonants

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Abstract. The plosive consonants /p, b, t, d, k, g/ are part of the Portuguese and English phonological systems. However, in Portuguese, these segments cannot occur in coda position (Cristófaro-Silva, 1999). For that reason, a Brazilian learner of English as an additional language might have a hard time producing a plosive consonant when it is in coda position, especially when they are beginner learners of English. For instance, the word *notebook* can be produced as [ˈnoʊtʃiˈbuki] by a Brazilian Portuguese (BP) speaker. The strategy to add an epenthetic vowel [i] is known to be a common syllable simplification process used by Brazilian learners of English (Zimmer et al., 2009). In relation to learners with Down syndrome (DS), studies have shown that they have a cognitive deficit with delay in their linguistic development, and a speech full of omissions and substitutions (Oliveira et al., 2017). Thus, our main question is: how do these learners with Down syndrome produce English words that have plosive consonants in coda position? Our hypothesis is that learners with Down syndrome produce vocalic epenthesis too. For our analysis, we transcribed the oral production of five Brazilian learners with DS who study English as a foreign language in the project "Nucleo Saber Down" at the State University of Southwest Bahia (Brazil). The results indicate that: i) although learners with DS have a cognitive deficit and delay in their linguistic development, they use the same strategy used by learners without DS, that is, vocalic epenthesis, and ii) that learners with DS show evidence of phonological knowledge of their native language as they obey the important phonotactic rule of BP phonology that plosive consonants do not occur in coda position.

Keywords: Down syndrome; Brazilian Portuguese; English learning; phonological process

Introduction

According to Patterson (1999), Down syndrome (DS) is the most common genetic cause of mental retardation in the world and it affects one in approximately 700 live births. The cause of this syndrome is a result of having an extra copy of chromosome 21 (Patterson, 1999), while the risk of having a baby with DS is elevated with older maternal age (Mattheis, 1999). Although, Down syndrome is not an illness (Laura et al., 1995), people with DS have increased risk for health problems, as for example, congenital heart disease, which occurs in 30-60% of children with DS, and Alzheimer (Cohen, 1999; Patterson, 1999).

Kumin's (1999) study found that many children with Down syndrome face more difficulties with expressive language than receptive language. Also, some linguistic areas can be harder than others, such as grammar. Vocabulary is usually easier for them. On the other hand, producing a combination of sounds is also problematic, because articulation and intelligibility are two areas that often present difficulties when you are born with Down syndrome. Further, Miller et al. (1995) also states that the poorly developed maxilla, the small oral cavity and the weak facial muscles of the person with DS may restrict their speech production.

Even though the information provided above is true, it is important to keep in mind that Down syndrome will not prevent the development of a child (Mattheis, 1999). That is, learners with Down syndrome should have the same opportunities and support to develop their own abilities and strengths as any other learner. Therefore, this paper addresses the pronunciation of English words by Brazilian learners with Down syndrome. Further, we considered some common transfer processes used by Brazilian learners of English with Down syndrome learning English as a foreign language. Our hypothesis is that Brazilian learners with Down syndrome, even though they have a cognitive deficit, a delay in their linguistic development, and a speech full of omissions and substitutions (Oliveira, Pacheco & Pereira-Souza, 2017), they also use the phonological knowledge of their first language, Portuguese, to adapt words with plosive consonants in word-final position in English. Syllable simplification, substitution and epenthesis are some phonological processes used by these learners. These strategies to adapt unfamiliar sounds and combination of sounds are used by people without Down syndrome as well (Avery & Ehrlich, 1992; Zimmer et al., 2009).

Down syndrome and language development characteristics

As a consequence of the extra copy of the 21st chromosome, individuals with Down syndrome are biologically distinct from people without DS and these differences have an impact on their speech production (Miller et al., 1995). For instance, people with Down syndrome may suffer from hearing loss and poor visual ability (Cohen, 1999; McGuire & Chicoine, 1999). As a result, most of the children with Down syndrome face a certain level of speech and language challenge and speech therapy is needed to help them to address these difficulties (Kumin, 1999).

Stoel-Gammon (2001) reported that children with DS are slow to acquire the phonological system of their mother tongue. Also, their speech remains unintelligible throughout their life (Miller et al., 1995; Stoel-Gammon, 2001). McGuire and Chicoine (1999) observed that expressing feelings and thoughts verbally is difficult for some individuals with Down syndrome as well. Therefore, it is important to help people with Down syndrome to develop their linguistic abilities because communication skills contribute to their inclusion and integration in the society (Kumin, 1999).

Cognitive deficit, hearing loss and anatomical differences are some factors that can impose difficulties in the phonological development of children with Down syndrome (Stoel-Gammon, 2001). Thus, perceiving and producing speech sounds are problematic for people with DS. As a result, the phonological system acquisition of their first language may be slower. Also, according to Stoel-Gammon (2001), people with DS are delayed in the use of meaningful speech. However, the author also says that the influence of these factors may vary from one individual to the other (Stoel-Gammon, 2001).

In a four-year longitudinal study, Smith and Stoel-Gammon (1983) compared the phonological patterns related to the production of the six stop consonants of English /p, t, k, b, d, g/ produced by children with Down syndrome and children who do not have DS. They found that both groups

produced the stop consonants correctly in initial position more frequently than in final position (Smith & Stoel-Gammon, 1983). Also, they found four common phonological processes related to the production of stops consonants: (a) final stop devoicing, (b) initial stop de-aspiration, (c) final stop deletion, and (d) initial stop cluster reduction. These phonological processes were also observed in the speech of children without Down syndrome. Although the five children with Down syndrome showed some improvement during their study, the authors observed that the children with Down syndrome progressed at a slower rate compared to the children who do not have DS.

Oliveira et al. (2017) also found some phonological processes in the speech of Brazilian individuals with Down syndrome. The authors divided these phonological processes into two categories: (a) substitution (e.g., lateralization, nasalization, sonorization, de-sonorization) and (b) syllable structure (e.g., cluster reduction, final consonant deletion, metathesis, and epenthesis). The authors believe that these phonological processes occurred because speakers with Down syndrome face many difficulties when it comes to producing speech sounds. Thus, their vocal tract, poor muscle tone and lack of ability to execute speech movements can impose difficulties on the articulation of speech sounds in their first language, that is, Portuguese (Oliveira et al., 2017).

The role of the first language in learning a foreign language

English is known as a global language. Therefore, many foreigners share the idea that learning English is a great opportunity to achieve a successful career nowadays. For instance, many companies require employees to know English at a certain level of proficiency. Also, English is the language of the internet. Many apps and websites have English names, such as Instagram, Twitter, Facebook, and YouTube. Likewise, English is the language of pop culture. Many well-known movies, songs and books are written in English.

However, learning English can be a difficult task to accomplish for some non-native speakers. For instance, Avery and Ehrlich (1992), among others, point out that the native language may affect the acquisition of the sound system of a second language. The authors state that every language has its inventory of sounds, its rules of sound combinations (phonotactics), and its stress and intonation patterns. Further, Avery and Ehrlich (1992) affirm that pronunciation errors are not random attempts to produce the sounds of the second language. Rather, the authors state that these pronunciation errors "reflect the sound inventory, rules of combination, and the stress and intonation patterns of the native language" (Avery & Ehrlich, 1992:15).

As a result of the phonological differences between Portuguese and English, Zimmer et al., (2009) report on some phonological process used by Brazilian Portuguese speakers when speaking English as a foreign language. Such processes include: syllable simplification e.g., ['teɪpi] for "tape"; de-aspiration of voiceless stops e.g., [ti] for "tea", and terminal devoicing in word-final position e.g., [dɔk] for "dog". Due to the fact that plosive consonants do not occur in word-final position in Portuguese (Cristófaro-Silva, 1999), Brazilian learners of English tend to have difficulties to produce words with a plosive consonant in word-final position.

Zimmer et al. (2009) believe that the more advanced the learners are, the fewer phonological process they use. Yet, some phonological processes may have a negative impact on the learner's intelligibility. For that reason, teachers should bear in mind the importance of teaching English pronunciation to help students to produce intelligible speech in English.

Method

We selected 5 Brazilian learners (2 boys and 3 girls) with Down syndrome (15 to 19 years old) among the participants of the 'Nucleo Saber Down', which is an extension project at the State University of Southwestern Bahia (UESB). The main goal of this extension project is to develop studies in order to understand the language development of people with Down syndrome.

These five Brazilian learners with Down syndrome had English classes once a week. We planned a couple of lessons on basic vocabulary in English, such as color, clothes, and animals. In each lesson, these students needed to produce a few monosyllabic words in English. All words had a plosive consonant in word-final position, which is a combination of sounds not allowed in Portuguese.

First, we taught them how to pronounce each word in English. Then, we asked them to name images based on the words that they had already learned. To make the lessons fun and engaging, we used games and songs to teach the words, as well. All these activities were recorded in video. Then, we watched the videos and investigated what transfer process these Brazilian learners with Down syndrome used to adapt the monosyllabic words in English. We phonetically transcribed the words and classified their pronunciation based on the identified transfer process used by them. This study had approval by the Research Ethics Committee of CEP/UESB - CAAE: 56134921.0.0000.0055.

Discussion and Results

As mentioned, Down syndrome is a genetic condition that can impact an individual in many different ways. One of the areas that is most problematic for these people is their language development. As a result, Oliveira et al. (2017) and Smith and Stoel-Gammon (1983) found a number of specific phonological processes in the speech of people with Down syndrome. The authors believe that these processes occurred due to the articulatory difficulties that people with Down syndrome have when they produce and perceive speech sounds, such as small oral cavity, hearing loss, and poor muscle tone.

According to Avery and Ehrlich (1992), and Zimmer et al. (2009), learners' first language affects their speech production when they are learning a foreign language. Thus, the native language impacts the acquisition of the sound system of a second language.

Although, individuals with Down syndrome face delay in their language development and also have some articulatory difficulties resulting from the syndrome, we are arguing that the sound system of Portuguese can also influence their pronunciation of English words.

Table 1 shows that more than one phonological process occur at the same time. However, we focused on the following processes: epenthesis, devoicing, substitution, and palatalization.

Zimmer et al. (2009) state that epenthesis is a common strategy used by Brazilian learners to adapt the syllable structure of word in English. In Portuguese, the velar plosive /g/, which is produced when the back part of the tongue touches the velum (Avery & Ehrlich (1992), is not phonotactically permitted to occur in word-final position (Cristófaro-Silva, 1992). Therefore, our Brazilian learner used a high front vowel, /i/, to adapt the syllable structure of the word from CCV to CVCV, which is a combination allowed in Portuguese.

Table 1. Phonological processes used by Brazilian speakers with Down syndrome

Target word	**phonemic transcription**	**phonetic transcription**	**Phonological Process**
pig	/pɪg/	['pigi]	*Epenthesis*
dog	/dɑːg/	['dɔki]	*Epenthesis*
cat	/kæt/	[kɛʃ]	*substitution*
cat	/kæt/	['kɛtʃi]	*palatalization*

Oliveira et al., (2017) also found word-final devoicing in their study. Due to the articulatory difficulties that people with Down syndrome have, our Brazilian learner did not articulate the velar stop as a voiced one. Instead, he articulated this sound as a voiceless one and epenthesized a vowel. This finding confirms that the articulatory difficulties faced by learners with Down syndrome may impact their pronunciation in a foreign language.

Table 1 shows that the word "cat" was produced in two different ways. In [kɛʃ], the learner with DS did not use a vowel to adapt the syllable structure of the word. However, the learner used a voiceless postalveolar fricative, [ʃ], which is a consonant sound allowed to occur in word final position in Portuguese. In ['kɛtʃi], the learner with DS used a vowel to adapt the structure of the monosyllabic word to a disyllabic word. Also, due to this change, a palatalization process occurred because, in some dialects of Brazilian Portuguese, when a bilabial stop /t, d/ is followed by a high front vowel /i/, the plosive consonant is produced as a postalveolar affricate. These results demonstrate that Brazilian learners with Down syndrome also exhibit influence of their first language when they are learning English.

Conclusion

The learner with Down syndrome is a learner first. Therefore, these learners should not have their right to learn additional languages denied because of the syndrome. Our study has shown that these individuals, even though they have a cognitive deficit, hearing loss problems, and smaller oral cavity, they also are influenced by their first language, Portuguese, when they are producing sounds in English sounds, similarly to any other language learner.

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Dialectal knowledge and use in African American English: A Southern Louisiana perspective

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Abstract. Wolfram (2007) suggested that researchers study aspects of regional variation within the African American English (AAE) dialect. This would improve overall knowledge and use of the dialect among speakers and listeners. However, research on specific semantic changes and its user's knowledge and perspectives of these differences is limited. This study investigates AAE speakers' knowledge of the semantic differences in using AAE terms across different ages. Twenty-five AAE speakers participated in this study ranging from ages 15 to 75, all of whom have been residents of Southern Louisiana. A one-on-one interview with the chief investigator using a pre-script of 17 questions, followed by a spontaneous conversation using pre-script terminology throughout the conversation, was completed. The results indicated that most participants had a knowledge base of all words/phrases presented, but this did not suggest they use these terms regularly within and outside the dialect. They also indicated that the meanings of some words/phrases might change depending on the context and individual involved in the conversation. The finding that some AAE speakers use and perceive words/phrases differently within the dialect is important. This adds to the literature that helps shift the perspective regarding the notion of homogeneity in AAE. This will also aid in comprehending the dialect among researchers and clinical professionals who don't speak the vernacular.

Keywords: African American English (AAE); dialect; semantics; Southern Louisiana

Introduction

A variation or variety within a language is known as a dialect. Individuals' location, ethnicity, culture, or language used in their speech community are characteristics of identification for specific dialects. Black Language, African American English (AAE), Black English, African American English Vernacular, Black dialect, and Ebonics are all terminologies used by society to describe the dialectal system of African American English dialect. AAE is a rule-governed, systematic, and structured system based on being a variation of Standard American English (SAE). AAE dialect is a variation within the standard language that differs in syntax, phonology, and lexicon. The dialect evolved from early pidginization and later creolization of African languages throughout the diaspora. The roots of the AAE dialect were established in the rural South. Through its development over time, it has been primarily associated with its use in Southern urban areas and comparisons to Southern English (Rickford, 1997; Wolfram, 2000). AAE dialect can be heard among many individuals in the United States and is acknowledged as a marker of social identity.

The dispersion of the AAE dialect is a by-product of the Great Migration of African Americans from the rule south of large metropolitan areas of the north in the early-mid 20th century. This migration brought about somewhat of a cultural shift to these larger cities. In 1910 almost 90% of African Americans in the United States lived in the South, and 75% of that number lived in communities of less than 2500 people (Wolfram, 2000). By 2000, 60% of African Americans lived outside of the South, and an estimated 6 million African Americans of those living in metropolitan cities such as New York, Chicago, Washington DC, Baltimore, and Philadelphia (Wolfram, 2000). Each generation unavoidably shifted and altered their dialect of AAE contingent upon the cultural norms established by other African Americans they encountered in their communities.

The Use and Variability of the AAE Dialect

AAE speakers of this dialect may also show various regional differences amongst themselves in closely related regional locations. For example, Green (2002) stated that speakers of AAE in Louisiana and Texas might exhibit similar semantic patterns, but their vowel cells may differ. Speakers from Pennsylvania may not share the same syntactic patterns as Louisiana and Texas as those from other southern States. Wolfram (2000) found that AAE dialect speakers from a northern area such as Pittsburgh may not show phonological changes as individuals from the southern region. Differences may be more apparent in the morphological and syntactical patterns. For example, the phrase "*we washed the car*" may be produced, *Northern AAE*- (The *car needs washed*) or Southern AAE (*dey washed the ca*). These statements deliver the same message but in slightly different ways. Many individuals have assumed that all AAE speakers "talk the same." Wolfram (2007) suggested that this homogeneity myth dismisses substantial aspects of regional variation within the dialect.

The verbal and nonverbal perceptual skills of speakers within this dialect are also critical. Claudia Mitchell-Kernan (1972) referred to one nonverbal speech act common within the dialect as a "signifying" feature. Mitchell-Kernan developed signifying as a way within the dialect of encoding messages or meanings in natural conversation. In some cases or most cases, this may involve an element of indirection. Signifying is not only directed to the linguistic interaction because it is not a defining moment of the speech event itself. It may include information automatically assumed by the communication partner within the dialect. This assumption is based on the patterns and perceptions of AAE speakers within the dialect.

An example in AAE would be if individuals pass by one another and do not say a word or utterance. Instead, the speakers may give a simple head tilt upwards or point towards the other individuals as a way of communication or saying, "How are you?". These nonverbal speech acts are pretty standard within the dialect and may vary depending on the dialect.

In an exert from Neal Hurcheon's *Voices of North Carolina,* Wolfram (2007) cited how much the geographical location of AAE speakers can change not only their production of different voices and sounds but also words entirely**.** For example, a speaker from North Carolina stated, "you can tell the difference between someone who lives in Durham, Winston Salem, or Fayetteville. They may "skraight" for "straight" or "skreet" for "straight," depending on their geographical location. This was also seen in Wolfram's investigations of multiple rural North Carolina communities that represented very different regional dialects and locations. These communities ranged from the Outer Banks of the coastal North Carolina area to Roanoke Island, north of the outer banks, to Southern Appalachia, west of the state. They found some similarities between the groups but differences in many areas, specifically the use and lack of the -s and -r phoneme between the

regions. The differences were so significant that they even found that listeners from outside of the region were consistently misinterpreting the ethnicity of African Americans from the Appalachia and Outer Banks areas (Childs & Mallinson 2006; Wolfram & Thomas 2002).

In addition, a study done by Oetting and Pruitt (2005) displayed variability in AAE in speakers from the southern region of Louisiana. They compared the speakers' age and their places of residency (urban vs. rural) within a 20-mile radius of one another. In the study, 49 participants were used, 24 being rural ages 4-6 years, 25 from urban residences 3-6 years old. The results showed that the patterns of these children had some differences but were more similar between the groups. This study was based on research done by Bailey and Maynor (1987) on the variation of language use with using age and residency as variables. The significant difference was that Bailey and Manor looked at adults and adolescents. The study done by Bailey and Manor included seven elderly adults and 20 adolescents. They studied the habitual use of the copula. The results revealed a dramatic difference in the use of the copula *be* (e.g., *she be talkin'*). The adolescents used this on average, 44% compared to the adults, 4% in the interviews conducted. The adults in this study were all over 70 and in the lower socioeconomic classification. They lived in a rural location and had less than a grade school education. All adolescents were 13 years of age and identified as poor, but they lived within a city, and all encountered integrated classrooms.

Stigmatisms and Perceptions

Public opinion of this dialect presents it as a corrupted or degenerate form of the standardized English form (Siegel, 1999). These negative attitudes, the use of the dialect, its speakers' comprehension of specific lexical terms, and when to use the dialect have driven intense conversation about this dialect being labeled as a stigma. The history of the social stigmatism is deeply rooted in ignorance and lack of knowledge associated with AAE. This opinion of the AAE dialect is thought to prevent individuals from getting successful jobs, high-paying jobs, and acceptance into college, or having meaningful education. This stigmatized view has caused many speakers of the dialect to be ashamed, and some even attempt to deculturize themselves from the African American diaspora. A study done by Diehm and Hendricks (2021) showed a bias against AAE use. Teachers in their study demonstrated limited knowledge and linguistic terms related to the AAE dialect. The teachers believe that this particular dialect will be more appropriate outside of the classroom despite the lack of understanding and cultural appreciation for the students they serve. This is persistent with the negative opinions of AAE that have existed since the time of its inception.

Investigating the dialectical variations in AAE and other American English dialects is essential in addressing the issue of "language difference vs. language disorder." Efforts to accurately diagnose and treat disorders require the clinician to exclude dialectal differences from treatment diagnosis and treatment. These variations are due to cultural, regional, and local community differences in articulation, semantic meaning, and use. Information about these variations would potentially facilitate the clinical decision-making of speech-language pathologists.

Thus, more information is needed in the literature about this dialect's study of accountability of multiple forms of AAE dialect across different locations and age groups. We want to specifically examine the dialect associated with African Americans living in southern Louisiana. In this study, we investigate the differences in the meaning of words/phrases, the identification and acceptance of these differences, and the frequency of use of various similar words/phrases in the southern AAE dialect.

Methodology

Participants and Procedures

All participants completed a written consent approved by the institutional review board at the University of Louisiana Lafayette. There were over 25 individuals studied in this investigation. The demographics of the subject ages ranged from 15 to 75. All participants were native speakers of African American English and current or former residents of Southern Louisiana. All participants were also of African American descent. An iPad was used to record all interviews with each participant. All interviews were conducted in person or by telephone in a quiet room to minimize distractions during the interview process.

Three separate age groups were classified to account for semantic variability across all ages. The groups categorized individuals based on generational timelines. There were: ages 9-26 (Gen Z); ages 27-47 (Gen X & Millennials); and ages 48-76 (Early Gen X & Baby boomers).

The interview consisted of a one-on-one semi-structured interview with the investigator. The investigator used a pre-script questionnaire of 17 questions. The questionnaire's words/phrases identified their use in the southern AAE dialect. In addition, a separate spontaneous speech sample was obtained using a separate pre-script terminology sheet based on age-related categorically identified southern AAE dialectal terms. For all participants, responses were categorically analyzed by the participants' knowledge base of word/phrase, the most commonly used word/phrase from each question given, and perceptual differences in words/phrases given. The knowledge base used a binary (yes/no) system scoring format for each question. Calculations of the words and phrases used were tallied by each selection made by each participant in reference to the pre-scripted questionnaire. Lastly, interpretation of the perceptual differences was based solely on the definitions and examples of the word/phrases identified by each participant.

Speech Transcription

Once collected, all recordings of subjects were analyzed orthographically. The primary examiner completed the manual transcription by hand. A systematic and repetitive (from audio recording) review of all transcripts were completed separately from one another. All scored responses from the scripted interview are documented in an excel spreadsheet. This process was done to identify any phenomena of interest that may require further investigation.

Results

The average age for all participants was 42.2. The average time for each interview was 10:26 across all participants. The percentage of knowledge among all participants with questions 1-17 was 91% of all options. The no knowledge of these terms was 9%. Words that had a 25% or larger non-familiarity scale across all participants were: *bossed out, go sit on the garit/garret,* and *beer garden.* This non-familiarity was across all ages and not specific to any particular group. Table 1 shows the word/phrase familiarity by age range in the semi-structured questionnaire.

In the spontaneous speech portion of the study, participants noted to have little knowledge of terms such as: *over yonder*, *ratchet*, *pressure*, *not a nare*, *the man*, *jocing*, *federal*, and *joked out*. These responses were across all ages and not specific to any particular group.

Table 1. Word/phrase familiarity

Participant age ranges	% knowledge base of terms	No knowledge of terms presented
9-26	88%	12%
27-47	90%	10%
48-76	91%	9%

Perceptual Differences Specific to AAE

Variation in the use of terminology was different among all the speakers. Some speakers were familiar with the context of the study and the way the investigator used these words and phrases. The variation of each speaker's use of these phrases came from their perspective and use of the dialect throughout their personal lives. Some speakers admitted to not regularly using these particular terms within and outside of their dialect. They do not speak their dialect daily or constantly regardless of communication partners they may encounter. One term precepted with multiple meanings was *freak*. In the generation of 47-74, over 50% of the participants identified this word to have a different meaning than the other participants in younger age brackets. Probing of this word was given to those in this age range, but the older generation stated they were not as familiar with this term's use in this study. Other common terms noted in the survey that the speakers showed a contrast in perception are shown in Table 2.

Table 2. Other common terms with different meanings

Participant age ranges	Commonly used word/phrase with different meanings
9-26	none identified
27-47	catdaddy, the man, pressure, retarded, get your lesson, freak, not a nare,
48-76	freak, fasho, retarded, make a play, ratchet, hip, pressure

Context Specific Dialectal Use

Most participants in the study acknowledged that some word meanings form and use are only a small portion of the overall message. Some speakers stated that some of these terms elicited are used situationally. Many participants in this interview expressed the words/phrases may differ in conversation depending on the partner in AAE. An example from the study is the word *icebox*. That term revealed 100% knowledge base by all speakers of the study, but this term was more common among participants between the ages of 47-74. The following sentences are specific words/phrases from the survey. *Man, that's a freak athlete; they live over yonder, over there; her appearance reminded me of a freak.* Some words had more uniformity and increased use across all speakers in any conversational situation. Examples are *cold drink*, *stylin, profilin, bling*, and *hosepipe*. Also noted is the use of non-dialectal words/phrases regularly at times. Another form of speaking style used by AAE speakers is known as code-switching. Many speakers of the dialect tend to utilize their ability to code-switch between AAE and SAE. This is a widespread practice within the dialect, as many speakers may not feel comfortable using AAE in all situations. In contrast, some feel it is appropriate to use it all the time. Some may argue that when AAE speakers talk in their dialect, it is acceptable to others in society. They feel others may not understand or feel comfortable with the vernacular differences. Table 3 conveys the daily or regularly used dialectal words/phrases used by each participant chosen from the pre-script questionnaire. Some participants stated they used multiple terms in some selected questions.

Table 3. Participants' regularly used terms

word/phrases	% use across participants	Corresponding question
timepiece	41%	Question 1
bling	53%	
ice	29%	
lord say the same	71%	Question 2
lord willing	71%	
with gods help	41%	
stylin and profilin	59%	Question 3
drippin	18%	
stuntin	59%	
flossin	6%	
bossed out	6%	
cold drink	100%	Question 4
soft drink (non-dialectal)	24%	
soda pop (non-dialectal)	35%	
pop	12%	
hosepipe	Over 100%	Question 5
water hose (not dialectal)	29%	
garden hose	6%	
get in your lesson	35%	Question 6
complete your homework	53%	
get in them books	24%	
filling station	12%	Question 7
gas station (not dialectal)	Over 100%	
icebox	12%	Question 8
refrigerator (not dialectal)	100%	
the box	0%	
broad	47%	Question 9

Discussion and Conclusions

The participants in the study revealed a lot of patterns within the dialect, and all used some form of the dialect in both the structured and spontaneous portions of the study. Common themes such as *context-specific dialect use*, *dialectal variations among the specific communication partners*, and *perceptual changes of specific AAE terminology* were identified. Some groups identified there was little knowledge of specific terms used in the study, but if these terms were put into context, this would aid in understanding these words/phrases. Investigations within the AAE dialect cannot just rely solely on syntactical and phonological differences. Considering the importance of speakers' lexical use, the differences within the use dependent on the speaker and their location and the perception of the words/phrases used are equally significant.

The study proved that AAE is an ever-evolving dialectal form despite the age differences, variation of dialect, as well as both perception and use. More research is needed to contribute to better understanding of regional dialectal variations. Future work should focus on the cause of these perceived differences in AAE speakers in the dialect. The results of this study are significant because they will help communication overall among all speakers. It will also aid those not familiar with AAE in understanding its speakers and their knowledge and use of the language. Limitations of this study were the number of participants and the difficulty of some terminology presented to participants not being used in context, only in a multiple-choice format. Future research would study the cause of perception differences with words/phrases besides changes in context.

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Development of phonetic complexity in multilingual Lebanese children

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Abstract. Children's early phonetic development is constrained by both universal biological limitations and target language characteristics. Several studies on monolingual children have examined word phonetic complexity showing its increase with age. However, the development of phonetic complexity in multilingual children is still rarely studied. The aim of this study is to describe the development of word phonetic complexity in multilingual children speaking Lebanese Arabic and French and/or English. Spontaneous utterances of 16 Lebanese multilingual children aged between 16-30 months were recorded. Using an adaptation of Jakielski's (2000) Index of Phonetic Complexity (IPC), we assessed the phonetic complexity in all three languages of both produced and targeted words by two groups of children aged between 16-20 and 27-30 months. Our findings show that the IPCs of the oldest group were significantly higher than the IPCs of the youngest group. Moreover, children's productions' IPC was always inferior to that of target words in all three languages, indicating that children still had articulatory limitations.

Keywords: phonetic complexity; acquisition; multilingual; Lebanese Arabic

Introduction

Children typically produce their first words around 12 months of age (Pearson, 2008). However, children's first words tend to be phonetically less complex than those of the adult language because children's early phonetic inventories are restricted by anatomical constraints. In their early years, children's phonetic inventory is primarily composed of sounds produced by the jaw, on which they have better muscular control compared to other articulators such as the tongue and the lips (Davis & MacNeilage, 1995). Consequently, the first utterances produced by children, although belonging to different linguistic environments, share the same phonetic and phonological characteristics. Furthermore, these universal constraints have been shown to influence the words that children select to produce; children attempt to produce words composed of sounds and sounds combinations already present in their phonetic system (Ferguson & Farwell, 1975; Schwartz & Leonard, 1982; Stoel-Gammon, 1998).

In order to assess children's phonetic development, Jakielski (2000) proposed an experimental index, the Index of Phonetic Complexity (IPC). The IPC permits to measure the phonetic complexity of produced and targeted words by children, and considers productions composed of less preferred segments and segments combinations as more complex. Using the IPC, several studies of monolingual children have shown that the IPC scores of productions and targets increase with age (Bellemmouche, 2016; Charlier & Juhem, 2007; Gayraud et al., 2018). Moreover, it has been shown that children's actual productions are phonetically less complex than the targets.

These previous studies provide data about the development of phonetic complexity in monolingual populations. However, phonetic complexity is rarely studied among bilingual children, and even less among children acquiring dialectal Arabic as a first language. In Lebanon, most of the population uses at least two languages on a daily basis. The Lebanese child is exposed since birth to French and/or English in addition to Lebanese Arabic (Kouba-Hreich & Messarra, 2020). The current study aims at examining the phonetic complexity in bilingual Lebanese children speaking Lebanese Arabic, French and/or English between 16 and 30 months of age. The IPC was used to assess the phonetic complexity of produced and targeted words in all the three languages.

We elaborated three hypotheses:

H1. Children's productions' IPC increases with age
H2. Children's targets' IPC increases with age
H3. Targets IPC is higher than productions' IPC

Methodology

Population

Sixteen Lebanese bilingual children aged between 16 and 30 months were included in the study. Recruitment was done through connections, as well as through contact with daycares. The children have been divided into two age groups (Gr1: 16-20 months; Gr2: 27-30 months) (Table 1). We excluded children born prematurely, children born in twins, and children with a medical condition affecting language development.

Table 1. Participants' demographic information

Age groups	N	Sex	M age	SD age
Gr1: 16-20 mo.	8	5F/3M	19.1 mo.	1.6
Gr2: 27-30 mo.	8	3F/5M	27.4 mo.	1.2

To better understand children's early development history as well as their linguistic environment, parents were asked to fill an adapted version of The Questionnaire for Parents of Bilingual Children: Infants and Toddlers version (PaBiQ-IT, Gatt et al., 2015). The parents did not report any concerns about children's early language development, hearing status and general development. Based on the Index of Linguistic Richness obtained in the PaBiQ-IT, 14 children have Lebanese Arabic as their first language and 2 children have French as their first language.

Procedure

The children were recorded 30 minutes in semi-natural communication settings with their mothers. Due to the pandemic (Covid19), 7 children were filmed by the parents themselves using children's preferred toys and picture books.

Data Analysis

Each child's actual productions and targets have been phonetically transcribed according to the International Phonetic Alphabet (IPA). Lexical words and personal names produced in Lebanese Arabic, French and English were included in the analysis. The transcribed data was then entered in Microsoft Excel for the IPC computation.

To assess productions and targets' phonetic complexity, an adaptation of the Index of Phonetic Complexity (Jakielski, 2000) was computed. The original IPC consists of 8 parameters: consonants by articulation manner and place, vowel by class, word shape, word length, singleton consonants by place variegation, consonants clusters and clusters by type (homo- vs hetero-organic). As the original IPC was designed to evaluate the phonetic complexity in English, we had to adapt it to consider typological particularities of the three languages under study. Thus, a new parameter was added, consonants by articulation class (simple vs complex) (Gayraud et al., 2018), that considers the pharyngealized consonants attested in Arabic ([tˁ, dˁ, sˁ, zˁ]). Hence, this parameter accounts for Lebanese Arabic only. In the same way, the rhoticity parameter accounts only for English as rhotic vowels are not attested neither in Arabic nor in French.

After IPC calculation was done, the data was imported to the Statistical Package for Social Sciences version 22 (SPSS 22) to perform the required statistical analysis. This latter was done based on the mean IPC score for each age group. As each child produced and targeted a different number of words, the mean IPC was weighted by the number of words for each child. 4 variables were analyzed for both productions (IPCp) and targets (IPCt): total IPC (IPC tot) for all languages combined, Lebanese IPC (IPC leb), French IPC (IPC fr), and English IPC (IPC eng). Giving that the data was not normally distributed, the non-parametric tests of Mann-Whitney U and Wilcoxon were used to perform the required comparisons supporting our different hypothesis.

Results

To verify H1, the mean productions' IPC score was compared between the two age groups. As displayed in Figure 1, children's IPCp scores are significantly higher in the older group compared to the younger group: IPCp tot ($U=228.01$; $p<0.001$), IPCp leb ($U=64.83$; $p<0.001$), IPCp eng ($U=5.16$; $p<0.001$), et IPCp fr ($U=10.03$; $p<0.001$). Additionally, as illustrated in Figure 2, each of the 9 parameters contributed differently to the overall IPCp score for both age groups: articulation manner (Gr1: 33.5%; Gr2: 31.6%), place variegation (Gr1: 23.7%; Gr2: 25%), articulation place (Gr1: 16.8%; Gr2: 10.4%), word shape (Gr1:16.4%; Gr2: 12.8%), articulation class (Gr1: 0.6%; Gr2: 1.6%), vowel by class (Gr1: 0.2%; Gr2: 0.5%), word length (Gr1: 3.9%; Gr2: 6.1%), clusters (Gr1: 2.9%; Gr2: 7.4%) and clusters by type (Gr1: 2.1%; Gr2: 4.7%).

To verify H2, the mean targets' IPC score was compared between the two age groups. Our results displayed in Figure 1 show significantly higher IPCt scores for the older group: (IPCt tot: $U=199.22$; $p<0.001$; IPCt leb: $U=57.88$; $p<0.001$; IPCt eng: $U=5.16$; $p<0.001$; IPCt fr: $U=6.95$; $P<0.05$). Additionally, Figure 2 shows that all the 9 parameters contribute differently to the overall IPCt score for both age groups : articulation manner (Gr1: 30.7%; Gr2: 30.1%), variegation by place (Gr1: 19.1%; Gr2: 22.9%), articulation place (Gr1: 15.5%; Gr2: 11.3%), word shape (Gr1: 12.4%; Gr2: 11.5%), articulation class (Gr1: 2.5%; Gr2: 3.4%), vowel by class (Gr1: 0.7%; Gr2: 1.2%), word length (Gr1: 4.4%; Gr2: 5.3%), clusters (Gr1: 8.6%; Gr2: 8.7%), and clusters by type (Gr1: 6.2%; Gr2: 5.5%).

To verify H3, the mean IPCp and IPCt scores for each age group were compared. As illustrated in Figure 1, IPCt scores are significantly higher than the IPCp for both age groups: IPC tot (Gr1: Z=2.52; p<0.05 ; Gr2: Z=2.53 ; p<0.05), IPC leb (Gr1: Z=2.52; p<0.05 ; Gr2: Z=2.52 ; p<0.05), IPC eng (Gr1: Z=2.37; p<0.05 ; Gr2: Z=2.2 ; p<0.05), IPC fr (Gr1: Z=2.36; p<0.05 ; Gr2: Z=2.2 ; p<0.05).

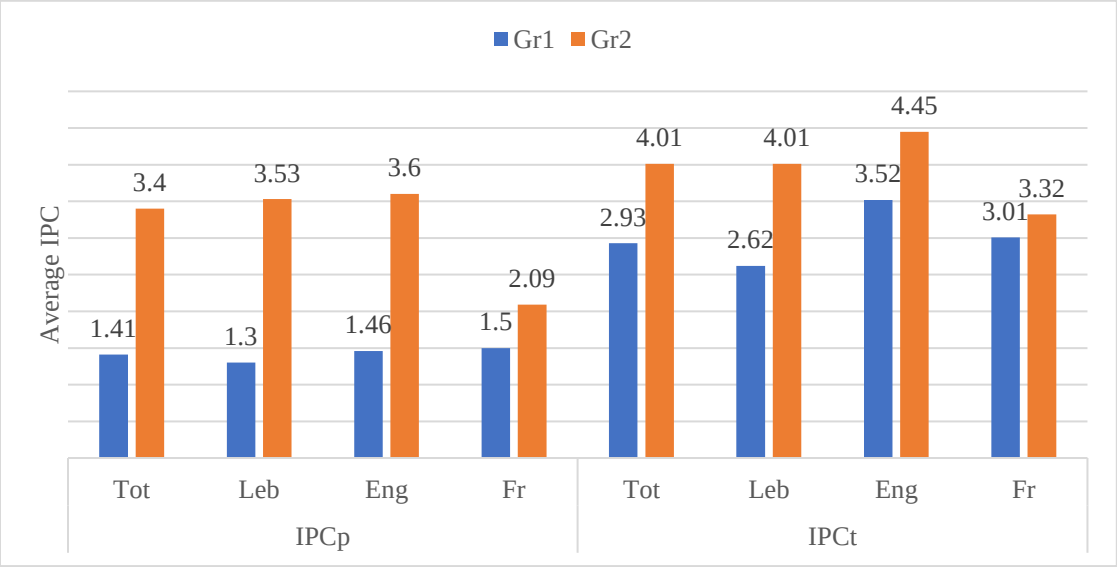

Figure 1. Mean productions and targets' IPC scores for both age groups in all languages

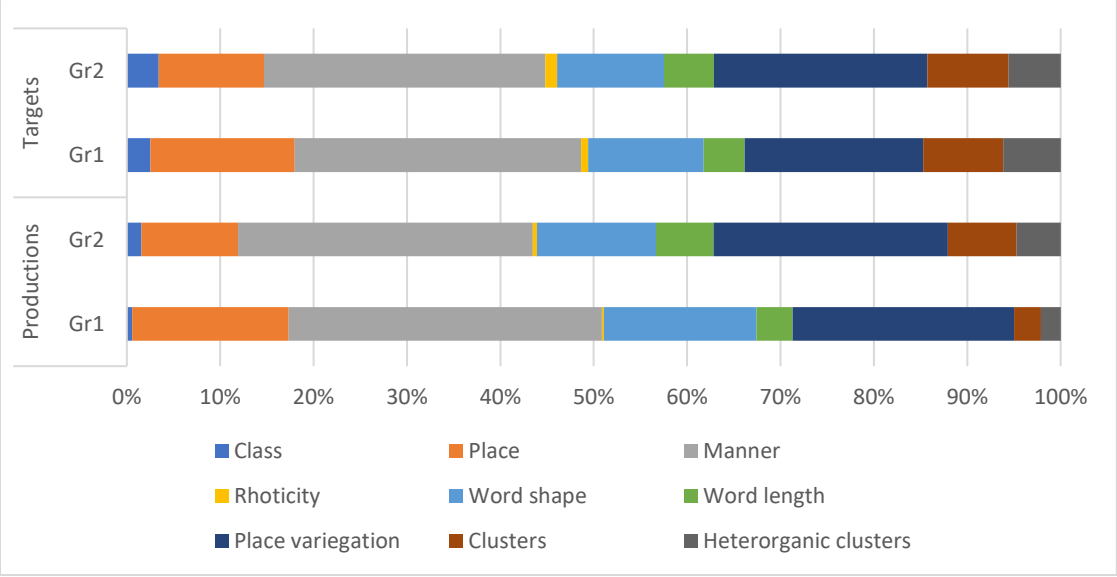

Figure 2. Parameter's contribution relatively to the total IPC score for both age groups

Discussion and Conclusion

This study aimed to explore productions and targets' phonetic complexity of multilingual Lebanese children. We globally hypothesized that children's productions and targets would be shaped by the universal biological constraints as well as an increasing phonetic complexity according to age.

Concerning children's productions, our results reveal that as hypothesized, older children's IPCp scores are significantly higher than those of the younger children whether Lebanese, French and English are combined or for each language separately. This indicates that in their early years, bilingual children's phonetic abilities are shaped by the universal mechanical constraints as monolinguals are (Bellemmouche, 2016; Charlier & Juhem, 2007; Gayraud & al., 2018). As they grow up, they acquire a better muscular control of their articulators permitting the production of phonetically more complex words similarly in all their languages.

Moving to targets' phonetic complexity, our results show that IPCt scores of the older group are significantly higher than those of the younger group in all their languages, thus validating our assumption. This indicates that bilingual children attempt to produce phonetically simple words during early stages of lexical acquisition. Thus, bilingual children same as monolinguals adopt a lexical selection strategy according to their articulatory skills (Bellemmouche, 2016; Charlier & Juhem, 2007; Ferguson & Farwell, 1975; Gayraud et al., 2018; Schwartz & Leonard, 1982). The lexical selection is also supported by our observations concerning parameters' contributions which appear to be similar in productions and targets. For example, between 16 and 20 months, parameter 3 relative to articulation manner accounts for 33.5% and 30.7% in productions and targets respectively showing that children frequently attempt to produce words with fricatives giving that they can produce this type of consonants. In the same way, parameter 6 relative to word length accounts for 3.9% in productions and 4.4% in targets indicating that children are more likely to avoid multisyllabic words which they are not yet able to produce.

However, despite this similar parameters' contribution, our results show that targets' IPC scores are significantly higher than those of productions for both age groups as expected in H3. Thus, between 16 and 30 months of age, bilingual children produce phonetically less accurate words than those they target, because they still have articulatory limitations same as their monolingual peers (Bellemmouche, 2016; Charlier & Juhem, 2007; Gayraud & al., 2018).

Furthermore, all the 9 parameters contribute differently to the total IPC score in productions and targets and for both age groups. For instance, manner of articulation exhibits the highest contribution to the overall IPC score showing that bilingual children frequently target and produce fricatives and liquids same as monolingual children (Bellemmouche, 2016; Charlier & Juhem, 2007; Gayraud & al., 2018). The second most contributing parameter is that relative to place variegation. This means that children become able to control the articulatory movements of the tongue by moving it back and forth (Davis & MacNeilage, 1995). The least contributing parameters are those related to word length, clusters, pharyngeal consonants, and rhotic vowels. This indicates that these sounds and sounds combinations are more likely to be avoided by children between 16 and 30 months because they are phonetically more complex and need more time to master.

Finally, interesting results emerged when we analyzed the data cross-linguistically. We observed that productions' IPC appears to be similar across the three languages independently of language dominance. For example, the child LUE whose L1 is Lebanese, and L2 is French had similar IPC

scores (IPCp leb: 1.4; IPCp fr: 1.44). The child KAH whose L1 is Lebanese and L2 is English also displayed the same tendency (IPCp leb:3.8; IPCp eng: 3.5) as well as SOJ who is dominant in French (IPCp fr: 1.6; IPCp leb: 1.61). The similarity in phonetic complexity manifests the universality of early phonetic development but also leads to questioning about possible inter-linguistic effects. In addition, some cross-linguistic variations were noticed in parameters' contribution to the total IPC score. For instance, LUE's (L1 Leb; L2 Fr) results show quite equal contribution for word length (0 and 0.38) and clusters (0 and 0) in Lebanese and French respectively. Contrarily, place variegation contributes more to the IPC score in Lebanese than in French (9.3 and 3.4 respectively) as well as word shape (3.8 and 1.9 respectively). These language-specific patterns might be explained by typological differences of each of the two languages' phonetic and phonological systems. These observations will have to be confirmed in further cross-linguistic analyses.

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Comprehension of non-canonical sentences by Greek-speaking children: Developmental and clinical aspects

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Abstract. Comprehension of non-canonical sentences may be challenging for students with learning difficulties (LD) and it is important to know in which way. The aim of the study is twofold: to investigate the development of comprehension skills for non-canonical sentences, and to explore performance of students with LD when different sentence types are employed. Four Groups of monolingual Greek-speaking children participated. Preschool-A (N=16, mean age=52 months) at the commencement of preschool education, Preschool-B (N = 17, mean age = 60 months) attending the second year of preschool education, school aged children with LD (N=7, mean age=105,6 months), School aged controls matched on age and gender to LD participants (N=14, mean age=03 months). A sentence comprehension task was used for the assessment of Active, Passive, Subject and Object Relative sentences. One picture in each of the three-picture sets corresponded to the target sentence, the other contained the same characters as the target sentence but thematic roles were reversed, and the third was a distractor. Preschool-B children scored higher than Preschool-A children, yet differences in performance were not significant. School aged children outperformed Preschool-A children in all sentence types and Preschool-B children in all sentence types except from Object Relative sentences. Children with LD performed significantly lower than controls on Passive sentences (t(19)=2.74, p=.013), 66.7% target performance, as well as on Actives t(19)=2.60, p=.018, 94.7% target performance, but not on Subject and Object Relatives (94.94% and 81.55% target performance respectively). A significant difference in performance was observed between Subject and Object Relative clauses for all groups of children. Findings of the present study indicate that language comprehension skills for non-canonical sentences undergo development during preschool and school years. School aged children with LD may find the comprehension of Greek passive sentence structures particularly challenging.

Keywords: non-canonical sentences; Greek; subject/object relatives; passives; learning difficulties

Introduction

The structure of our knowledge is closely linked to the structure of language (Olson, 2017). Children with developmental language disorder may exhibit difficulties in implicit learning mechanisms that are associated with the detection and extraction of abstract structural regularities in linguistic input (Garraffa et al., 2018); data from syntactic priming effects suggest that this impairment involves reduced initial learning from each syntactic experience. The syntactic computation required for relative clauses may have an effect on comprehension and production. Data from typically developing children (Arosio et al., 2009) and children with developmental

language disorder (Friedmann & Novogrodsky, 2007) provide evidence that object relative clauses are more taxing than subject relatives. Preschool aged children may exhibit difficulties with relatives both in comprehension and production modalities (Adani, 2011). Comprehension of non-canonical sentences may be challenging for students with learning difficulties (LD) (Contemori & Garraffa, 2010; Friedmann & Novogrodsky, 2007; Mastropavlou & Tsimpli, 2011) and a mature cognitive system is required to support processing of non-canonical word order (Contemori & Garraffa, 2010).

Developmental disorders may affect language, learning and cognition. Children may be experiencing difficulties in the domains of spoken language (comprehension and production); reading skills (decoding, text comprehension); arithmetic; motor skills; attention; social interaction. Specific learning difficulties involve disorders where there is a deficit in just one or a small number of skills, with typical functioning in other areas; general learning difficulties comprise limitations in acquiring a wide range of skills. In practice, the distinction between specific and general learning difficulties is often based on the results of a standardized IQ test. Children with specific learning difficulties typically have average or near to average IQ scores (Hulme & Snowling, 2009). According to the 5th Edition of the Diagnostic Statistical Manual (DSM-5) (American Psychiatric Association, 2013) specific learning difficulties are defined as a neurodevelopmental disorder that becomes apparent during the years of formal schooling as persistent difficulties in at least one of three primary academic domains: reading, writing and/ or mathematics. Educational underachievement reflects a set of core cognitive deficits that may comprise attention difficulties, memory problems and limited processing speed (Reid, 2016).

Comprehension of structures containing intervention may be particularly challenging for children with specific learning difficulties (Stanford & Delage, 2020). A syntactic relation that involves a moved object and an intervening subject that share a featural specification may lead to syntactic difficulties, especially for children with reduced working memory capacity.

Aim of the Study

The aim of the study is twofold: (1) To investigate the development of comprehension skills for non-canonical sentences, and (2) To explore performance of children with LD when different sentence types are employed.

Specific research questions to be addressed are the following:

1. Is there a significant difference in performance between TD Greek-speaking children of different ages in the comprehension of non-canonical sentences?
2. Is there a significant difference in performance between different sentence types?
3. Is there a significant difference in performance between children with LD and TD controls?

Method

Participants

Four Groups of monolingual Greek-speaking children participated in the study. (1) Preschool A (N=16, mean age=52 months) at the beginning of preschool education, (2) Preschool B (N=17, mean age=60 months) attending the second year of preschool education, (3) Clinical group:

school-age children with LD (N=7, mean age =105,6 months), and (3) Control group of school-age children matched on age and gender to LD participants (N=14, mean age=103 months).

Participating preschool aged and school aged children were recruited from public kindergartens and primary schools respectively. School aged children with LD were recruited among the children receiving intervention at the Clinic of the Speech and Language Therapy Department of the University of Patras. Parental written consent was obtained for the study following the Declaration of Helsinki ethical procedures. Where both the consent of the parent and the assent of the child were obtained, children were recruited to the study.

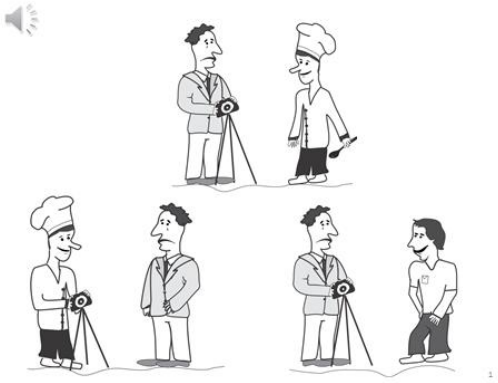
Assessment Task

A sentence comprehension task comprising of Active, Passive, Subject and Object Relative sentences was used, along with sets of three pictures (with line drawings). Children would listen to pre-recorded sentences and were asked to point to the corresponding picture. The picture selection task was administered on a computer screen via a ppt. file. There were three pictures in each slide, one that corresponded to the target picture, and two more that will be described below. Sentences were pseudo-randomized, so that: (1) sentences with the same verb were not next to each other, (2) no more than two sentences of the same condition were next to each other, and (3) no more than two sentences with the target picture in the same position were next to each other.

Furthermore, the position of the target picture was pseudo-randomized both within each condition and within the entire protocol.

Subject Relative Sentences

For Subject Relative Sentences (SUBJ R), besides the target picture, there was a picture depicting the corresponding Object Relative (that is, with the thematic roles reversed), and a third one in which the subject of the target sentence performed the action of the verb to another individual, as it can be seen in Figure (1).

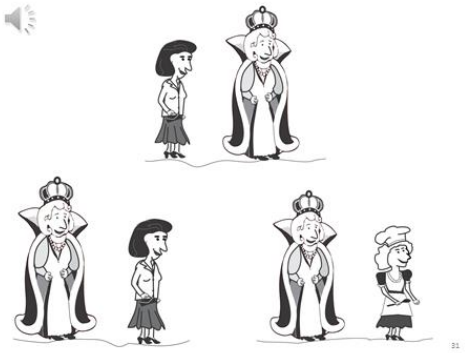


Εδώ είναι ο κύριος που φωτογραφίζει το μάγειρα
"Here is the man that photographs the cook"
Here is the man.$_{NOM}$ that photographs the cook.$_{ACC}$

Figure 1. SUBJ R

Object Relative Sentences

For Object Relative Sentences (OBJ R), besides the target picture, there was a picture of the counterpart Subject Relative (that is, with the thematic roles reversed), and a third one in which the object of the target sentence performed the action of the verb to another individual, as it can be seen in Figure (2).

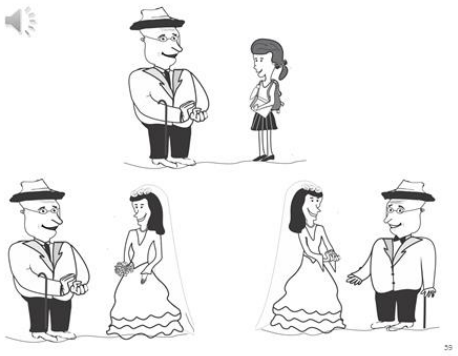


Εδώ είναι η βασίλισσα που ακολουθεί η κυρία.
"Here is the queen that the lady follows"
Here is the queen.NOM that follows the lady.NOM

Figure 2. OBJ R

Passive Sentences

For Passive Sentences (PASS), besides the target picture, there was a picture of the corresponding Active (that is, with the thematic roles reversed), and a third one in which the subject of the target (passive) sentence performed the action of the verb to another individual, in Figure (3).



Εδώ ο παππούς χειροκροτείται από τη νύφη.
"Here the grandpa is applauded by the bride"
Here the grandpa.NOM is applauded by the bride.ACC.

Figure 3. PASS

Active Sentences

Finally, for Active Sentences, besides the target picture, there was a picture of the corresponding Passive (that is, with the thematic roles reversed again), and a third one in which the object of the target (active) sentence performed the action of the verb to another individual.

There were 24 sentences in each sentence type/condition, with all characters and actions repeated in all four conditions.

Results

Table 1 provides an overview of performance accuracy. Raw scores were converted to percentages; Means and Standard deviations were calculated for (a) active sentences, (b) subject relative sentences (c) object relative sentences and (d) passive sentences, across the different groups of participants.

Table 1. Descriptive statistics of performance accuracy across groups

Sentence Type	Preschool A M (±S.D.)	Preschool B M (±S.D.)	School TD M (±S.D.)	School LD M (±S.D.)
Actives	85.28 (13.37)	90.44 (11.34)	99.40 (.96)	94.64 (6.89)
Subject Relatives	81.39 (15.14)	86.27 (15.04)	98.21 (2.14)	94.94 (6.23)
Object Relatives	66.80 (18.81)	78.43 (16.10)	87.20 (12.22)	81.54 (11.12)
Passives	43.61 (13.44)	52.57 (16.98)	83.19 (17.13)	66.67 (22.50)

Repeated Measures Anova was performed with Sentence Type (actives, subject relatives, object relatives, passives) as the within groups factor and Group (preschool A, preschool B, School TD, School LD) as the between groups factor, with Bonferroni adjustment for multiple comparisons. Results showed a significant main effect of Group $F(3, 49)=12.72$, $p<.001$, as well as a significant main effect of Sentence Type $F(3,47)=57.87$, $p<.001$.

In order to investigate the main effect of Group pairwise comparisons of performance between groups with Bonferroni adjustment for multiple comparisons were used. Results showed that Preschool B children scored higher than Preschool A children, yet differences in performance were not significant; Preschool A children were significantly outperformed both by School aged TD children ($p=.001$) and school aged children with LD ($p=.014$); Preschool B children were significantly outperformed by school aged TD children ($p<.001$), yet there was not a significant difference in performance between Preschool B children and school aged children with LD ($p=.660$).

Regarding the second research question, in order to investigate the main effect of Sentence Type paired-samples t-tests were performed for each group to compare performance accuracy across conditions. Results are summarized in Table 2; p-values are reported (non-significant differences in performance are in parenthesis).

Regarding the third research question independent-samples t-test were performed to compare performance between the two groups of school aged children, i.e. typically developing and children with LD. School aged TD children outperformed School aged children with LD in active sentences $t_{(19)}=2.60$, $p=.018$ and passive sentences $t_{(19)}=2.74$, $p=.013$. Between groups comparison of performance for subject relatives $t_{(19)}=1.80$, $p=.087$ and object relatives $t_{(19)}=.028$, $p=.822$ was not significant.

Table 2. Within groups comparison of performance accuracy across conditions, paired-differences summary of p-values

Paired differences	Preschool A	Preschool B	School TD	School LD
Actives vs Passives	p<.001	p<.001	p=.003	p=.017
Actives vs Subject Relatives	p=.031	p=.024	p=.040	(p=.805)
Actives vs Object Relatives	p<.001	p=.001	p=.002	p=.014
Subject vs Object Relatives	p=.001	p<.006	p=.002	p=.027
Subject Relatives vs Passives	p<.001	p<.001	p=.004	p=.015
Object Relatives vs Passives	p=.001	p=.001	(p=.467)	p=.001

Discussion

This study set out to explore the comprehension of complex/non-canonical sentences by Greek-speaking children taking both a developmental and clinical perspective.

From a developmental point of view significant improvement in performance accuracy was observed between typically developing preschool aged children and school aged children. This is in line with cross-linguistic literature suggesting that comprehension of relative clauses has not been fully acquired by the age of 4-5 years (Adani, 2009). Object Relatives are significantly more taxing compared to Subject Relatives for the Greek-speaking children, confirming previous findings for Greek (Varlokosta et al., 2015) and cross-linguistic findings (Arosio et al., 2009; Friedmann & Novogrodsky, 2007).

From a clinical point of view, it is important to point out that school aged children with LD performed significantly lower than TD controls on active and passive sentences. Starting with passives, present findings suggest that they constitute a challenging structure of complex syntactic processing in Greek. On the other hand, cross-linguistic studies in Italian & Hebrew (Contemori & Garraffa 2010; Friedmann & Novogrodsky, 2007) propose Object Relative Sentences as a vulnerable area of complex syntactic processing. This is a novel finding as regards syntactic limitations of Greek-speaking children with LD that contributes to the cross-linguistic body of research on non-canonical sentences. The fact that children with LD experienced difficulties with the comprehension of active sentences, in the sense that they performed lower than their School TD controls, although only slightly so, raises the possibility that cognitive mechanisms such as attention difficulties, memory problems and limited processing speed (Reid, 2016), may have an impact on performance. Cognitive limitations have been previously reported to have an adverse effect on comprehension of syntactic structures for children with LD (Arosio et al., 2011, 2012; Montgomery et al., 2009; Robertson & Joanisse, 2010). The performance of the same children on passives, however, suggests that additional factors are involved in the mastery of this type of non-canonical sentences.

Conclusion

Findings of the present study indicate that language comprehension skills for non-canonical sentences undergo development during preschool and school years. School aged children with LD

may find the comprehension of specific sentence structures particularly challenging. Passive sentences are a particularly demanding area of grammar for Greek-speaking children with LD.

Findings of the present study have implications both for clinical practice and educational context. Understanding of non-canonical sentences cannot be taken for granted in the assessment of preschool children. School aged students with learning disabilities may need intervention in the areas of grammar that are found most challenging; passive sentences seem to be such an area in Greek.

Acknowledgment

The authors would like to thank the participating children.

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How to diagnose DLD in bilingual children using dynamic assessment

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Abstract. ***Purpose***: Dynamic Assessment (DA) of narratives and syntax can discriminate children with typical development (TD) from those with Developmental Language Disorder (DLD), regardless of their linguistic status, i.e., mono- or bilingual (Hasson et al., 2013; Petersen et al., 2017). The aim of this study is to create a DA of narrative and syntactic skills in French and to assess if these tasks can differentiate DLD from TD, in mono- and bilingual children. Participants included 49 French-speaking bilinguals and 58 monolinguals aged 6 to 10; 54 children were diagnosed with DLD and 53 had TD. Children were administered either the narrative or the syntactic DA task (based on Hasson et al., 2013 and Petersen et al., 2017). In the syntactic task, children had to describe pictures of simple actions and received graduated prompts when they did not produce the target structures. These structures included simple and complex sentences. In the narrative task, children participated in a short teaching phase, in which macrostructural elements (e.g., characters, setting, problem, problem solving, final setting and characters' feelings) were taught, followed by a posttest. Macrostructural score (one point for each macrostructural element), microstructural one (scoring of prepositions, verb/noun modifiers, temporal and causal ties) and Mean Length of Utterance (MLU) were considered in the results. Both tasks distinguished TD from DLD children, regardless of their linguistic status since no differences were found between mono- and bilinguals. More precisely, children with DLD needed more prompts than TD children to produce complex syntactic structures and they performed lower in microstructure than their TD peers, within the narrative task. Our findings suggest that our new DA tasks could be used to distinguish TD from DLD in French-speaking monolingual and bilingual children. These findings open new paths in the clinical field of language disorders assessment.

Keywords: developmental language disorder; dynamic assessment; syntax; narrative

Introduction

Dynamic assessment (DA) has been developed based on the Vygotskian concept of "Zone of proximal development" (Vygotsky) and has been described by various authors (Camilieri et al., 2013; Hasson et al., 2012; 2013; Pena et al., 2006; Petersen, 2017). DA estimates children's learning potential and allows us to know how well children perform when help or guidance is provided (via specific prompts or a teaching phase). This type of assessment is therefore particularly suitable for bilingual children, since it differentiates real and persistent language difficulties from transitory difficulties related to lack of exposure to the language (Orellana et al., 2019). This is of utmost importance since diagnosing Developmental Language Disorder (DLD) in bilinguals is still a major challenge (Paradis et al., 2021; Thordadotir, 2021; Tuller, 2013).

Hasson and colleagues (2013) conducted DA of syntax in 25 bilingual English Typically Developing (TD) and DLD children (Mage = 5.8). At pretest, children had to describe a picture in one sentence. During the teaching phase, graduated prompting was delivered by the examiner, with elicitation (questions on the action) or modeling (correct structure to be repeated) if needed. Finally, children had to describe the same pictures, with no prompting given, in the posttest. Both groups performed better in post-test, with TD bilingual children outperforming DLD. As for DA of narratives, Petersen and colleagues (2017) administered a DA of narration to 42 English bilinguals (Mage = 7;7) , employing a pre-test - teaching - post-test procedure. The teaching phase focused on macrostructure (= narrative scheme elements). Results showed a difference between TD and DLD, based on the number of macrostructural elements produced in the post-test stories only.

The Current Study

By evaluating learning potential, DA allows discrimination between language mistakes due to lack of exposure to the language employed in the assessment and language disorder (Paradis et al., 2021). Despite the value of DA, no research has been conducted in French-speaking children on this topic, in either narration or morphosyntax.

Our research questions are two-fold:

1. Do our DA tasks of morphosyntax and narration discriminate between bilingual TD and DLD children?

2. Is this discrimination independent of the children's linguistic status?

Method

Table 1. Descriptive data on participants

	COGNITIVE GROUP	LINGUISTIC STATUS	N	GENDER	MEAN AGE	AGE RANGE	NON-VERBAL REASONING (RAW SCORE)
SYNTACTIC TASK	TD	Mono	15	7f	8;6	6;5-10;9	28.4
		Bi	9	3f	7;3	6;0-9;7	25.7
	DLD	Mono	7	2f	8;8	6;10-11;9	25.3
		Bi	11	5f	8;4	6;8-11;2	26.5
NARRATIVE TASK	TD	Mono	17	8f	8;5	6;2-10;10	27.4
		Bi	12	6f	8;2	6;3-10;9	26.7
	DLD	Mono	19	8f	8;10	6;6-10;7	24.4
		Bi	17	3f	8;4	6;3-10;9	25.2

Mono = monolinguals; Bi = bilinguals; f = females

Participants

We recruited 107 French-speaking participants, divided into 4 groups depending on their linguistic status and their diagnosis (see Table 1). Forty-two children took part individually in the syntactic DA and 65 in the narrative one. The four groups of children in each dynamic task did not differ by age nor by non-verbal reasoning (assessed by the Raven's matrices, Raven, 1998).

DA of Syntactic Skills

Children were first familiarized to the seven verbs used in the task by hearing the verb spoken and by seeing pictures, as in Hasson and colleagues (2012). Children were then asked to produce the target syntactic structures by answering specific questions. Target syntactic structures are shown in Table 2. If children's answers were incorrect or incomplete, graduated prompts were given and points were consequently attributed (see Table 3 for details on scoring).

Table 1. Target syntactic structure

	Simple grammatical structures	**Complex grammatical structures**	
DA	Subject-Verb-Object (SVO)	SVO-sentence with a subject relative	***of***
	SVO-sentence using a past tense	SOV-sentence with an accusative clitic pronoun	
		OVS with a passive sentence	
		OSV-sentence with an object relative	

Narrative Skills

The narrative task consisted of 1) a pretest (= story generation based on pictures); 2) a teaching phase, (=teaching of macro- and micro-structural elements of the story told in pretest, see Figure 1); and 3) a posttest (= generation of two stories, the same as in the pretest and a new one, both stories matching for complexity). For macrostructure, one point was attributed for each scheme element told. For microstructure, 0 to 3 points were assigned to language complexity elements, such as the use of causal or temporal connectors. Composite scores in macrostructure (/21) and in microstructure (/12) were considered, as well as the mean length of utterances (MLU).

Results

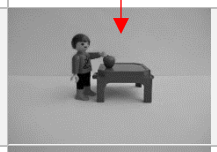
Research Question 1

Syntax

Bilingual children with DLD needed significantly more prompts to produce all complex target structures than TD children (see Figure 2), namely for SVO-sentences with a subject relative ($z = -2.33$, $p = .02$, $r = .52$), SOV-sentences with an accusative clitic pronoun ($z = -2.11$, $p = .03$, $r =$

.47), OVS with a passive sentence (z = -2.60, p = .009, r = .58), and OSV-sentences with an object relative (z = -2.48, p = .01, r = .56). As for SVO-sentences using a past tense, the difference was only marginal (z = -2.00, p = .05, r = .45). No difference was found between the two groups for SVO sentences using present tense (p = .79), suggesting a ceiling effect.

Table 2. Illustrations of graduated prompts and scoring for a subject relative (SOV sentence)

Graduated prompts	Points accorded	Description	Example
		Là le garçon prend la pomme. Ici le garçon mange la pomme. 'Here, the boy is taking the apple. Here, the boy is eating the apple.'	
No help needed to produce the target	6	Alors là, c'est quel garçon ? 'So here, which boy is it?' Expected answer: C'est le garçon qui prend la pomme. 'It is the boy who is taking the apple.'	
Visual priming	5	Red arrow pointing to the agent (or the patient for passives and object relatives)	 "Which boy is it?" *Expected answer*: "It is the boy who is taking the apple."
Gradual syntactic priming	4	A parallel example with different characters is provided by the examiner, followed by a return to the initial question (with the initial picture)	 "Which mother is it? It is the mum who is taking the bowl. Now which boy is it?" *Expected answer*: "It is the boy who is taking the apple."
	3	Another example is provided, with the same character as before asking again the initial question (with the initial picture)	 "What boy is it? It is the boy who is taking the banana. Now, what boy is it?" *Expected answer*: "It is the boy who is taking the apple."
	2	Gradual completion of the correct sentence given by the examiner	It…. It is …. It is the boy….
	1.5	Only one word is left for the child to say	It is the boy who is taking the…
Modeling	1	Repetition of the target sentence	It is the boy who is taking the apple.
	0	Failure to repeat the target sentence	

Narrative

Children with TD and those with DLD differed on microstructure measures (see Table 4), but not on macrostructure ones, nor on MLU.

Table 4. Differences in static scores of the narrative task in bilinguals

	Narrative measures	M_{TD} (SD)	M_{DLD} (SD)	z	*p*-value	R
Pretest	Macrostructure	11 (3.52)	11.3 (2.78)	-1.18	.24	
	Microstructure	5.92 (2.27)	4.29 (2.20)	-2.99	**.002**	.37
	MLU	10.2 (5.29)	9.10 (3.46)	-0.44	.67	
Posttest (story 1)	Macrostructure	14.5 (2.15)	13.7 (1.72)	-1.84	.07	
	Microstructure	7.17 (2.12)	5.71 (2.17)	-1.96	**.05**	.24
	MLU	9.98 (2.97)	9.96 (3.18)	1.62	.11	
Posttest (story 2)	Macrostructure	13.8 (3.60)	12.1 (2.93)	-0.82	.41	
	Microstructure	7.17 (1.90)	5.41 (2.12)	-2.59	**.01**	.32
	MLU	10.9 (4.57)	10.7 (3.72)	1.25	.21	

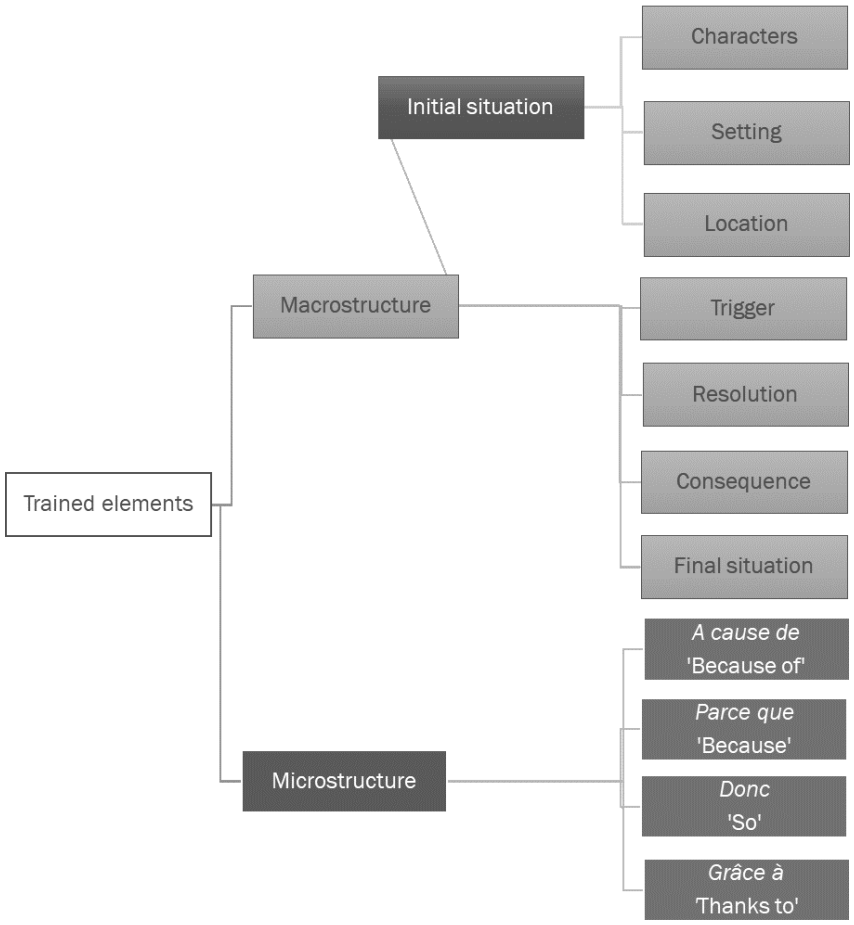


Figure 1. Trained elements in macro- and microstructure

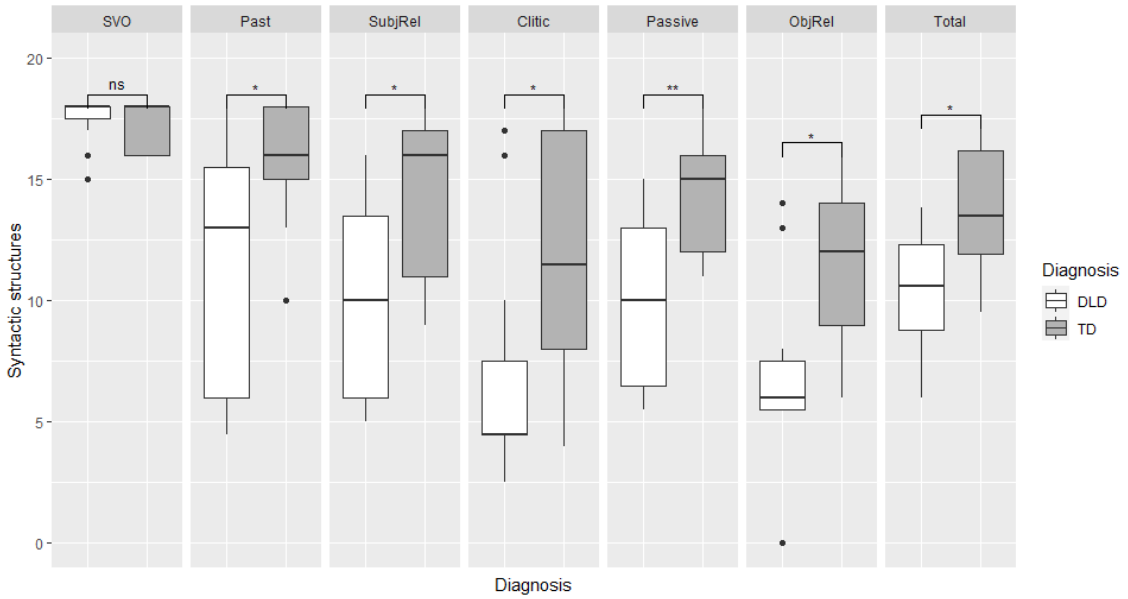


Figure 2. Comparisons of scores in DA of syntax in bilinguals. SVO: SVO-sentence; Past: SVO-sentence using a past tense; SubjRel: SVO-sentence with a subject relative; Clitic: SOV-sentence with an accusative clitic pronoun; Passive: OVS with a passive sentence; ObjRel: OSV-sentence with an object relative; ns: non-significant; ·: p < .10 (marginal); ∗p < .05; **p < .01

Research Question 2

Syntax

The number of prompts needed to produce the syntactic target structures did not differ when comparing mono- to bilinguals, whether TD or DLD, as shown in Table 5.

Table 5. Means and standard deviations of scores on the dynamic syntactic task in bilinguals

	TD				*DLD*			
	Mono	Bi	z	p	Mono	Bi	z	p
Total score	**90.8** (12.1)	**83.9** (15.8)	1.10	.27	**69.1** (13.7)	**62.4** (14.5)	.10	.32
SVO-sentence	**17.3** (1.84)	17.3 (1)	.71	.48	**16.7** (2.20)	**17.5** (1.04)	-.40	.69
SVO-sentence using a past tense	**16.5** (2.10)	**15.8** (2.77)	.68	.49	**13.3** (2.29)	**11.6** (5.07)	.32	.75
SVO-sentence with a subject relative	**15.2** (2.96)	**14.2** (3.56)	.82	.41	**11.7** (3.82)	**9.82** (4.19)	.92	.36
SOV-sentence with an accusative clitic pronoun	**13.8** (4.03)	**12.2** (5.16)	.45	.65	**8.21** (3.50)	**7** (5.04)	1.14	.25
OVS with a passive sentence	**15.6** (3.30)	**14.6** (2.70)	1.28	.20	**11.1** (3.89)	**10** (3.58)	.69	.49
OSV-sentence with an object relative	**12.3** (3.06)	**11.4** (3.24)	.63	.53	**7.14** (2.66)	**6.55** (4.34)	.23	.82

Narrative

There was no difference between mono- and bilinguals for all measures in the pretest and post-test of the narrative DA, in TD and DLD children (see Table 6).

Table 6. Means and standard deviations of scores on the dynamic narrative task in bilinguals

		TD				*DLD*			
		Mono	Bi	z	p	Mono	Bi	z	p
Pretest	Macrostructure	**11** (2.55)	**11** (3.52)	.11	.91	**9.68** (2.31)	**11.3** (2.78)	-1.89	.06
	Microstructure	**6.18** (1.81)	**5.92** (2.27)	.49	.62	**4.47** (1.98)	**4.29** (2.20)	.26	.80
	MLU	**8.60** (2.22)	**10.2** (5.29)	-.27	.80	**9.02** (3.18)	**9.10** (3.46)	-.14	.89
Posttest (story 1)	Macrostructure	**14.4** (2.42)	**14.5** (2.15)	.25	.80	**13.4** (2.55)	**13.7** (1.72)	-.76	.45
	Microstructure	**6.29** (1.40)	**7.17** (2.12)	-1.06	.29	**5.58** (2.04)	**5.71** (2.17)	-.13	.90
	MLU	**8.48** (3.06)	**9.98** (2.97)	-1.59	.11	**10.1** (2.41)	**9.96** (3.18)	.52	.60
Posttest (story 2)	Macrostructure	**11.9** (2.51)	**13.8** (3.60)	-1.38	.17	**11.8** (2.59)	**12.1** (2.93)	-.26	.80
	Microstructure	**6.06** (1.82)	**7.17** (1.90)	-1.60	.11	**4.95** (1.72)	**5.41** (2.12)	-.76	.45
	MLU	**9.05** (2.13)	**10.9** (4.57)	-1.06	.29	**11.9** (6.87)	**10.7** (3.72)	.24	.81

Discussion and Conclusion

In the DA of morphosyntax, TD bilinguals scored higher than those with DLD on the total syntactic score (collapsing across all structures), which is consistent with previous studies using static assessment of grammar in bilingual DLD populations (Fleckstein et al., 2018; Paradis et al., 2003). Moreover, complex structures generated larger differences between TD and DLD, as compared to simple sentences. Our complex structures included either phrasal movement or embedding, two properties known to be impaired in DLD children in a persistent way (Hamann & Tuller, 2014; Tuller et al., 2011; 2012).

In the DA of narration, TD children performed better than their DLD peers in microstructure, as in other studies focusing on narratives in bilinguals (Fiestas & Peña, 2004; Gutiérrez-Clellen, 2002). It partially confirms our hypothesis since we would have expected between-group differences in macrostructure and in MLU too, as reported in Petersen et al.'s study (2017). The absence of such differences could be related to the simplicity and the shortness of the narrative schemes in our two stories, which suggests that further fine tuning of our task is needed.

With respect to the impact of bilingualism, results showed that bilinguals were not penalized over monolinguals, either TD or DLD children, whether in syntax or in narration. This finding is a positive one and echoes the results of Hasson and colleagues (2013) for syntax, and of Pena et al. (2014) for narration.

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Narrative abilities of Russian heritage children: Evidence from Cyprus

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Abstract. Heritage language maintenance and development depend on the family language policy, language dominance, frequency of use, linguistic distance and similarities between the minority and the majority languages or dialects of the society (Montrul, 2016; Polinsky, 2018; Kupisch & Rothman, 2016), as well as on the multi-directionality of cross-linguistic influence and accommodation (Rothman et al., 2019). The present study investigates the narrative skills of Russian heritage children in Cyprus with a focus on macro-structure (story structure, structural complexity and internal states terms) and comprehension. The participants in the study were 40 Russian–Cypriot Greek (CG) simultaneous bilingual children. Their ages ranged from 4; 0 to 6;0 (Mean 5;2), and they attended kindergartens and primary CG schools at which the language of instruction was Greek. The LITMUS-MAIN, the multilingual assessment instrument for narratives (Gagarina et al., 2012, 2015), was used for the data collection. The children's language proficiency in Russian was measured using the Russian proficiency test for multilingual children (RPTMC; Gagarina et al., 2010). Background information was collected using parental questionnaires and interviews. The narratives were recorded, transcribed and analysed in terms of the macro-structure. The analysis of the data revealed that age, heritage language proficiency and the mode of narration (telling/retelling) affected the narrative abilities of Russian-CG bilingual children.

Keywords: narrative skills; macro-structure; Russian heritage children

Introduction

Heritage language maintenance and development depend on the family language policy, language dominance, frequency of use, linguistic distance and similarities between the minority and the majority languages or dialects of the society (Montrul, 2016; Polinsky, 2018; Kupisch & Rothman, 2016), as well as on the multi-directionality of cross-linguistic influence and accommodation (Rothman et al., 2019). The present study investigates the narrative skills of Russian heritage children in Cyprus with a focus on macro-structure (story structure, structural complexity, and internal states terms) and comprehension.

Narratives can measure the cognitive, linguistic and social skills of bilingual and multilingual children in a less biased way than is possible when using standardised assessments of language (Botting, 2002). Narratives can help to identify a child's linguistic, cognitive, semantic and social abilities, as well as their communicative competence and cultural awareness (Paradis et al., 2010). Narrative skills are essential for children's success at school.

According to the linguistic interdependence hypothesis, or dual iceberg hypothesis (Cummins, 1978), although each language has its own surface features, the cognitive processes that are associated with deep linguistic knowledge are common across languages. This hypothesis has been applied to the analysis of narratives in research on bilingual acquisition. The story structure, or macro-structure, is considered to be invariant and shared across a bilingual person's two languages because it depends on cognitive processes that are shared by the two (or more) languages (Pearson, 2002).

Different models have been proposed for the analysis of macrostructures (Stein & Glenn, 1979); according to the story grammar frameworks, a macro-structure includes the setting, which presents the time and place of the events, as well as the protagonists of the story, and the episodes that are based on goals (Lindgren, 2019). Narrative episodes can be analysed in terms of their structural complexity based on Westby's (2012: 211) decision-tree model, such as whether they have complete episodes containing goal–attempt–outcome sequences (GAO), or are incomplete and lack some of the constituent parts; for example, Attempt + Outcome (AO); Goal + Attempt (GA) or Goal + Outcome (GO) (Gagarina et al., 2012:11-12).

Structural complexity per episode, which refers to whether children are able to generate a complete episode (that is, GAO), is related to their ability to develop logical schemas or structured event complexes (Grafman, 2002). The macro-level of narrative organisation, to which we refer as the macro-structure in this paper, presupposes thematic coherence and semantic-pragmatic information. Children need to be able to understand the overall structure of the narrative, including having an adequate amount of information, and to take the listener's point of view or knowledge into consideration (Berman & Slobin, 1994). Failure to narrate successfully can be explained by children's inability to establish logical relationships between events (temporal and causal) or due to experiencing difficulty with episode structure, the central unit of story grammar, which includes both linguistic and non-linguistic processes. Episode completeness is composed of so-called macro-propositions. Specifically, each episode has three propositions: a goal, an attempt, and an outcome. The child's task is to understand the propositions and to sequence them in a logical way.

Narrative storytelling and story retelling tasks are both cognitively and linguistically demanding (Norbury & Bishop, 2003). Duinmeijer (2010) suggested that story generation was linguistically more demanding than was story retelling; there is a scaffolding effect in story retelling, as the story is first told by an adult and the child is then asked to retell the same story. In storytelling, the child does not have an example of the story and has to formulate the plotline by themselves. A child's independent story formulation abilities can best be examined via the mode of telling (Schneider et al., 2006). The retelling mode is associated with verbal memory, attention and story recall. Children do not simply repeat the narrative stimulus in the retelling mode, as they reconstruct and reinterpret the story; they modify the content of the story, its vocabulary and its grammatical structures (Gagarina et al., 2015), while the length, complexity and content of the narrative can be controlled for by the researcher (Liles, 1993). A similar type of control for various aspects of the story can be achieved if the relevant elicitation material (with parallel picture sequences), such as the LITMUS-MAIN (Gagarina et al., 2012, 2015), is used for the telling mode. This study aimed to answer the following research questions:

1. Does the mode of narration (telling/retelling) influence the macro-structure (story structure, structural complexity and the production of terms for internal states) and comprehension of bilingual children in their heritage language (Russian)?

2. What roles do variables such as age and the level of language proficiency, as well as the quantity and quality of input in the L1, play in bilingual children's narrative performances?

Study

Participants

The participants in the study were 40 Russian-Cypriot Greek (CG) simultaneous bilingual children, 24 girls and 16 boys, whose ages ranged from 4;0 to 6;0 (Mean 5;2); at the time of testing, they attended kindergartens and primary CG schools at which the language of instruction was Greek.

Materials and Procedure

The researcher implemented the LITMUS-MAIN (Gagarina et al., 2012, 2015) to collect data pertaining to narratives in Russian. The test included a telling mode in which the children were asked to tell the selected story (either Baby Birds or Baby Goats) to the experimenter; in the retelling mode, the children were asked to listen to a story (either Cat Story or Dog Story) told by the experimenter and were then asked to retell the story. No mutual sharing of the visual context and stimuli between the child and examiner took place. Each child was tested individually in his or her home environment and was presented with a sequence of six coloured pictures without text in a fold-out manner (two pictures at a time). Counterbalancing and randomisation of the stories for retelling and telling were implemented.

In addition, all the participants were tested using the Russian proficiency test for multilingual children (RPTMC; Gagarina et al., 2010). Furthermore, a parental questionnaire focusing on the participants' socio-economic and family language background was used (Gagarina et al., 2010). The RPTMC examined the following language domains: productive and receptive lexicon for verbs and nouns, the production of morphological marking on verbs (first- and second-person singular present verbal inflections) and nouns (accusative and dative singular), and the comprehension of grammatical constructions at the sentence level.

All the data sets, which were obtained via LITMUS-MAIN, were recorded, transcribed and analysed in terms of production and comprehension. We implemented four measures of macro-structure for both the telling and the retelling modes, namely story structure components (maximum 17 points), setting and mental states as initiating the event, goal, attempt or outcome, and the mental state as a reaction (three episodes in total). Structural complexity (episode completeness) focused on whether the children used a GAO in every episode (one point for each AO/AA, two points for each GA/GO and three points for each GAO). The total number of terms for internal states was counted as follows: comprehension questions (maximum 10 points), goal (three questions), ISTs (six questions) and TOM (one question).

Results

The analysis of the data obtained via the RPTMC (Gagarina et al., 2010) revealed that both four- and five-year-old bilingual children had higher scores for productive lexicon and perceptive lexicon. They had better performances regarding noun production in comparison to verb production, whereas noun and verb perception were almost at the same level. The two age groups had the same scores for case marking, while the five-year-olds were slightly more advanced than

were their four-year-old peers regarding the comprehension of grammatical structures, morphological marking on the verb, and receptive and productive lexicon (see Table 1).

With regard to the four-year-old Russian-CG bilingual children, the statistical analysis (a paired samples *t*-test) revealed that there was a statistically significant difference between noun and verb production *(t(19)=12.689, p=.000**)*, productive versus perceptive lexicon totals *(t(19)=13.100, p=.000**)*, noun perception versus noun production *(t(19)=16.904, p=.000**)* and verb perception versus verb production *(t(19)=5.255, p=.000*)*. A Pearson correlation statistical analysis revealed that the total lexicon production (RPTMC) was correlated with the story structure in the telling mode *(r(20)=.515*, p=.20)* and with comprehension questions in the retelling mode *(r(20)=.611*, p=.004)*; noun production was correlated with internal state terms in the retelling mode *(r(20)=.482*, p=.032)*, with the story structure in the telling mode *(r(20)=.595**, p=.006)*, and with comprehension questions in the retelling mode *(r(20)=.581**, p=.007)*, while verb production was correlated with comprehension questions in the retelling mode *(r(20)=.516*, p=.020)*. Total lexicon perception (RPTMC) was correlated with the story structure in the telling mode *(r(20)=.499*, p=.025)* and with comprehension questions in the retelling mode *(r(20)=.582**, p=.007)*. In addition, noun perception was correlated with the story structure *(r(20)=.520*, p=.019)* and comprehension questions in the retelling mode *(r(20)=.632**, p=.003)*; case marking was correlated with comprehension questions in the retelling mode *(r(20)=.675**, p=.001)*, and grammatical comprehension was correlated with internal state terms in the retelling mode *(r(20)=.485*, p=.001)*.

Table 1. Russian proficiency test for multilingual children

RPTMC/Mean scores	**Productive lexicon total (52)**	**Noun production (26)**	**Verb production (26)**
4;0-5;0	28.65	18.2	10.45
5;1-6;0	29.5	17.6	11.9
RPTMC/Mean scores	**Receptive lexicon total**	**Noun perception (10)**	**Verb perception (10)**
4;0-5;0	14.65	7.35	7.3
5;1-6;0	15.8	8	7.8
RPTMC/Mean scores	**Case (6)**	**Comprehension of grammatical structures (22)**	**Morphological marking on the verb (12)**
4;0-5;0	3	14	7.1
5;1-6;0	3	15.55	8.4

With regard to the five-year-old group, there was a statistically significant difference between noun and verb production *(t(19)=8.619, p=.000**)*, productive versus perceptive lexicon totals *(t(19)=7.923, p=.000**)*, noun perception versus noun production *(t(19)=10.289, p=.000**)*, and verb perception versus verb production *(t(19)=4.156, p=.001**)*. A Pearson correlation statistical analysis revealed that the RPTMC was correlated with the story structure in the retelling mode *(r(20)=.452*, p=.045)*, with comprehension questions in the retelling mode *(r(20)=.478*, p=.033)*, and with story structure in the telling mode *(r(20)=.543*, p=.013)*. Moreover, noun production was correlated with comprehension questions in the retelling mode *(r(20)=.473*, p=.035)* and with story structure in the telling mode *(r(20)=.498*, p=.025)*, while verb production

was correlated with the story structure in the retelling mode *(r(20)=.492*, p=.027)* and with story structure in the telling mode *(r(20)=.531*, p=.016)*; the total perceptive lexicon was correlated with comprehension questions in the retelling mode *(r(20)=.550*, p=.012)*. Furthermore, noun perception was correlated with internal state terms in the retelling mode *(r(20)=.453*, p=.045)*, as well as with comprehension questions in the retelling mode *(r(20)=.453*, p=.045)*, while morphological marking on verbs was correlated with comprehension questions in the retelling mode *(r(20)=.530*, p=.016).*

The analysis of the narratives revealed that there was a specific task effect on the participants' narrative skills in the telling versus the retelling mode. In particular, the four-year-old bilingual children attained higher scores for story structure, structural complexity and comprehension questions in the retelling mode, whereas they used more internal state terms in the telling mode. According to the paired samples *t*-test, there was a statistically significant difference between telling and retelling modes regarding comprehension questions *(t(19)= 6.784, p=.000**).*

The participants in the five-year-old group had higher scores for structural complexity, internal state terms and comprehension questions in the retelling mode, but scored slightly higher for story structure in the telling mode; see Table 2. According to the paired samples *t*-test, there was a statistically significant difference between telling and retelling modes regarding comprehension questions *(t(19)= 4.085, p=.001**).*

The comparison between the two age groups revealed that there was no age effect regarding the story structure in the retelling mode, as both groups' performances were the same. With regard to the internal state terms and comprehension questions, the older group attained better results, while the younger group had higher scores for structural complexity in the retelling mode. Furthermore, in the telling mode, the four-year olds had the same scores as the five-year-olds with regard to structural complexity and outperformed their older peers in terms of internal state terms. The five-year-old group scored higher for the story structure and comprehension questions; see Table 2.

Table 2. Narrative skills of Russian-CG bilingual children: Macro-structure and comprehension

MAIN Mean scores	**Story structure (17)**	**Structural complexity (9)**	**Internal state terms**	**Comprehension questions (10)**
Retelling: 4;0-5;0	6.5	2.5	2.8	7.55
Telling 4;0-5;0	5.8	2	3.55	4.85
Retelling 5;1-6;0	6.5	2.2	3.15	8.45
Telling 5;1-6;0	6.7	2	2.6	6.7

According to the paired samples *t*-test, there was a statistically significant difference between the two age groups concerning story structure in the telling mode *(t(19)= -2.100, p= .049*)* and for comprehension questions in the telling mode *(t(19)= -2.778, p=.012*).*

Discussion and Conclusion

The aim of the present study was to investigate the narrative skills of Russian heritage children in Cyprus with a focus on macro-structure (story structure, structural complexity and internal states terms) and comprehension. The researcher compared two age groups of bilingual Russian-CG children in terms of their Russian-language proficiency and macro-structure measures. The

analysis of the data revealed that Russian heritage speakers had better productive skills than they did perceptive lexical skills, and that they had superior performances with regard to noun production in comparison to verb production, which was not the case for lexical comprehension. The difference between the two age groups regarding such language proficiency measures of their heritage Russian language as the comprehension of grammatical structures, morphological marking on the verb, and receptive and productive lexicon confirmed that there was a developmental pattern in their development of the heritage language.

It was found that the mode of narration (telling/retelling) influenced the macro-structure; in particular, the telling mode triggered the use of more internal state terms by the four-year-old bilingual children and improved/more coherent story structure by the five-year-old bilingual children, whereas the retelling mode led to higher scores for story structure, structural complexity and comprehension questions for the younger age group and to structural complexity, internal state terms and comprehension questions for the older group. The ages of the participants appeared to affect their narrative skills, particularly their use of internal state terms, story structure and their comprehension of the story. The level of language proficiency affected their narrative abilities, as it was found that the measures of proficiency in the heritage language were correlated with the macro-structure measures.

Further analyses of micro-structure and grammaticality are needed in both the heritage and the majority languages of the bilingual children. It is important to include more age groups in order to compare the developmental factors and the effect of various social and linguistic factors on the narrative skills of bilingual children.

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Covert contrast in children's spectral moments' realizations of alveolar and alveopalatal fricatives in French

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Abstract. Alveopalatal fricatives /ʃ, ʒ/ are one of the last sets of sounds to be acquired by French-speaking children; they are often substituted by alveolar fricatives [s, z]. Studies that have employed spectral moments analyses show that spectral differences between alveolar and alveopalatal fricatives are not well defined in English-speaking three-year-olds but become so in five-year-olds. Nevertheless, children who are transcribed as making errors (e.g., /ʃ/ transcribed as [s]), may display evidence of a covert acoustic contrast. We investigate the production of alveolar and alveopalatal fricatives by French-speaking children using a spectral moments' analysis. We examine whether children transcribed as making errors are making covert acoustic contrasts in their speech. French-speaking monolingual and bilingual children (n=80), aged 2;6 to 6;10, participated in a naming task in which they produced words containing fricatives /s, ʃ/ in different word positions. Their productions were phonetically transcribed and acoustically analyzed. We measured the spectral mean or centroid for all fricative productions. Data were analyzed using mixed-effects models. We found a significant effect of age, gender, and sound on spectral means. Spectral means decreased with age, were higher for girls than boys, and were higher for /s/ than /ʃ/. Importantly, we documented a significant interaction between /ʃ/ accuracy (based on phonetic transcription) and spectral mean realization. As /ʃ/ accuracy increased, the contrast between centroid values for /s/ and /ʃ/ increased. The difference in centroid values was not significant for low /ʃ/ producers (less than 20% accuracy) but it was for mid (33-67% accuracy) and high /ʃ/ producers (greater than 75% accuracy). The findings suggest that many children display a reliable acoustic contrast between [s] and [ʃ] even though their transcription data indicate that the contrast has not yet been mastered.

Keywords: phonological acquisition; spectral moments; alveopalatal fricatives; acoustic analysis; French-speaking children

Introduction

Alveopalatal fricatives are difficult to produce. In French, they are one of the last sets of sounds to be acquired and are among the sounds most frequently targeted in speech sound intervention (Aicart-de-Falco & Vion, 1987). In this study, we investigate the production of the alveopalatal fricative /ʃ/ by French-speaking children, aged 2;6 to 6;10, and contrast its production with that of the alveolar fricative /s/. We conduct a spectral moments' analysis which details the spectral characteristics of segments in terms of multiple statistical moments. Previous studies in English indicate that children who are transcribed as making errors with alveopalatal fricatives (e.g., /ʃ/ transcribed as [s]), may display evidence of a covert acoustic contrast (Li et al., 2009). We

investigate whether covert contrasts are also present in the speech of French-speaking children acquiring alveopalatal fricatives.

Acquisition of alveolar and alveopalatal fricatives

Fricatives are sounds produced by air passing through a narrow constriction in the vocal tract. Alveopalatal, as opposed to alveolar fricatives, require motor differentiation of the blade versus tongue tip: /ʃ/ has a wider tongue groove resulting in a larger cross-sectional area than /s/, and the constriction for /ʃ/ is further back in the vocal tract than for /s/.

In French, MacLeod et al. (2011) report that /s, ʃ/ are late sounds being acquired after 4;5. Similarly, Aicart-de-Falco and Vion (1987), in a study of European French-speaking children, aged 3 to 6 years, report late acquisition of alveolar and alveopalatal fricatives. They note that over 60% of all consonant errors concern the sounds /s, ʃ/ (as well as /z, ʒ/) and that errors continue through to six years.

Covert contrast

When the acquisition of a sound contrast is protracted, children may pass through a stage in which they make a statistically significant acoustic difference between two sounds but one that is not perceptually reliable. This is referred to as a covert contrast. A well-known example is Macken and Barton's (1980) observation that there is a stage in Voice Onset Time (VOT) acquisition in which children produce target voiceless stops with significantly longer VOTs than target voiced stops but both within the short lag region; a listener, however, may not perceive the difference between these two stops. Other authors have reported covert contrast in the acquisition of place of articulation (PoA) such as the alveolar-velar stop distinction (Forrest et al., 1990; McAllister Byun et al., 2016), frontal misarticulations of /s/ ([s] vs. [θ], Schellinger et al., 2017) and in the alveolar-alveopalatal fricative distinction (Li et al., 2009), which we will discuss in greater detail.

Spectral moments' analysis of the alveolar-alveopalatal distinction

Li et al. (2009) used spectral moments' analyses to examine covert contrast in the acquisition of /s/ and /ʃ/ in English- and Japanese-speaking children. A spectral moments' analysis computes mathematical moments from the power spectrum. Four spectral moments are generally considered; however, in this study, we focus on the first spectral moment (also referred to as the spectral mean or centroid) which is one of the most useful for distinguishing alveolar and alveopalatal PoA. It calculates the average energy concentration, which is related to the location of constriction in the oral cavity. The point of constriction for /s, z/ is more anterior than for /ʃ, ʒ/ resulting in a shorter frontal cavity and higher mean energy.

Li et al. (2009) analyzed /s/ and /ʃ/ produced in word-initial position in two- and three-year-old English- and Japanese-speaking children. Given the fact that the children produced many fricatives with errors, they separated out children who produced a contrast between alveolar and alveopalatal fricatives and those who did not on the basis of phonetic transcription. They found a significant difference between /s/ and /ʃ/ (or between /s/ and /ɕ/ in the case of Japanese) for the first spectral moment in those children who were transcribed as producing a contrast; however, the distinction between the two fricatives was smaller than observed in adults. In those children who were transcribed as making errors, there was a covert contrast in a small number of children (n=4), although not necessarily for the first spectral moment (a covert contrast was evident for other spectral moments or for the onset of the second formant). In the remainder of the children (n=12),

there was no evidence of a distinction between /s/ and /ʃ/ in the transcription or spectral moments' analyses. Li et al. (2009) tested very young children (i.e., two- to three years) and it might be the case that covert contrast is more pronounced in older children. In addition, Li et al. (200) employed the criteria of 75% mastery to distinguish children who did or did not have a contrast in their phonetic transcription. However, this distinction may not be fine enough to classify children who don't have a distinction since there may be differences in spectral realization at low and middle levels of accuracy.

In this study, we examine whether French-speaking children, exhibit covert contrast between /s/ and /ʃ/ in their spectral moments' realization. We test children between two and six years of age to determine whether age influences the presence of covert contrast. Furthermore, we examine the presence of covert contrast in children who vary in their alveopalatal fricative accuracy. The finer categorization of alveopalatal fricative mastery may provide additional information on when children evidence covert contrast in their speech.

Methodology

Participants

Participants included 80 French-speaking monolingual and bilingual children, aged 2;6 to 6;10. Information on the number of participants across age is provided in Table 1. Based on questionnaire information, 20 of the 39 bilingual children were dominant and 19 were not dominant in French. The children had all received exposure to French before the age of three years. The languages spoken by the bilinguals included English, German, Swedish, Italian, and Spanish.

Table 1. Numbers of participants across age

Age	Mean age	n	Mon[a]	Bi	Girls	Boys
2	2;6	17	9	8	7	10
3	3;4	15	8	7	5	10
4	4;6	16	8	8	10	8
5	5;3	16	8	8	10	8
6	6;4	16	8	8	7	9

[a] Mon = monolinguals; Bi = bilinguals

Table 2. Examples of word stimuli containing /s/ and /ʃ/

Sound	Word-initial	Word-medial	Word-final
s	cinq	chaussure	brosse
	six	dessin	glace
ʃ	chaise	cochon	vache

chat	échelle	bouche

Stimuli

The stimuli for the children included words ranging from one to three syllables with target /s/ and /ʃ/ situated in word-initial, -medial, or -final positions. The majority of words were familiar to children as young as two- to three years. Examples of the word stimuli are provided in Table 2.

Procedure

Children took part in an object or word naming task of approximately 20 to 30 minutes (see Kehoe & Girardier, 2020 for further details). The two-year-olds were tested in the speech laboratory at the University of Geneva and the older children were tested in a quiet room in the children's kindergarten or school. Children's productions were recorded with a portable digital tape recorder.

Data Analyses

Using Phon, a software program designed for the analysis of phonological data (Rose & MacWhinney, 2014), each child's WAV file was segmented, and stimulus words were identified and transcribed. French-speaking graduate students, who had experience in phonetic transcription, performed the analyses.

Acoustic analyses were conducted in Praat (Boersma & Weenink, 2016). We used the time waveform, spectrogram, and amplitude contour to aid in the segmentation of fricatives. Once the fricative segment was identified, we ran a Praat script that extracted six spectra across the length of the fricative, averaged these spectra, and computed spectral moments based on this averaged spectrum. A large number of productions (approximately 300) were excluded because they were characterized by noise overlay, low or high volume, or were tokens that were difficult to segment.

Data-coding and Statistical Analyses

The analyses were performed using R statistical software (R Development Core Team, 2020) and the lme4 package for mixed models. The dependent variable was the spectral mean or centroid. Independent variables included age (in months), gender (male, female), bilingual status (mon, bi), sound (s or ʃ), and /ʃ/ accuracy. We used a continuous variable of percent accuracy based on the phonetic transcription of words included in the final database. In addition, we examined the interaction between sound and age to determine whether the centroid contrast between /s/ and /ʃ/ increased with age, and the interaction between /ʃ/ accuracy and sound to determine whether the centroid contrast was dependent upon the accuracy of /ʃ/. Random factors included participant and word token.

Results

Percent correct accuracy of /s/ and /ʃ/ across age range is presented in Figure 1. Percent correct accuracy was high for /s/ at all age ranges whereas accuracy for /ʃ/ was low at the youngest age

and grew steadily until it approached 100% at 6 years. Standard deviations were large for /ʃ/ between two to five years.

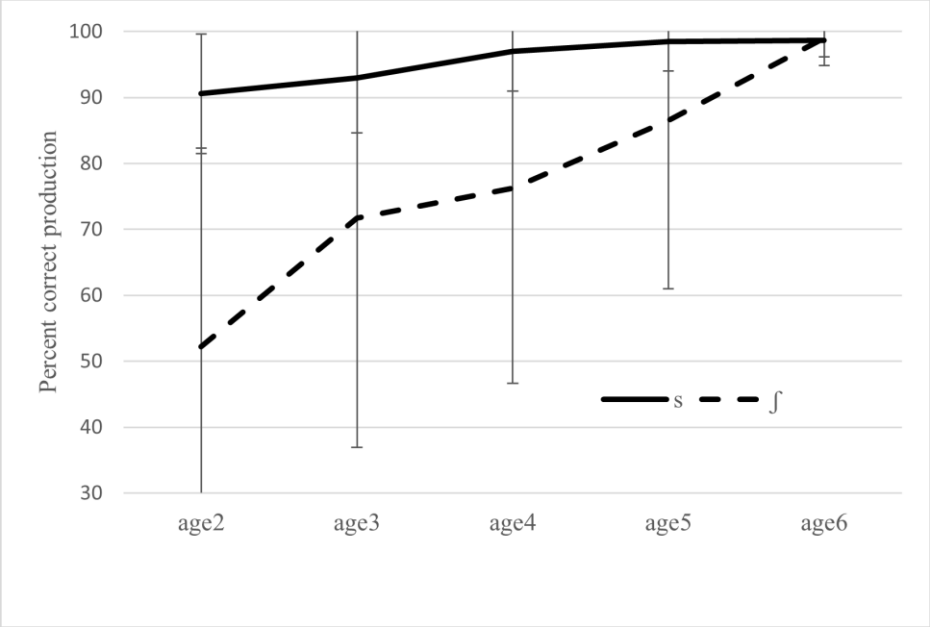

Figure 1. Percent correct production of /s/ and /ʃ/ across age. Error bars indicate standard deviations

Table 3 presents the best-fitting model for factors that influence centroid values. Age, gender, and sound were significant. Centroid values decreased with age, were higher in girls than boys, and were higher in /s/ versus /ʃ/. There was no influence of monolingual status on centroid realization. In addition, there was a significant interaction between age and sound: the difference between centroid values for /s/ and /ʃ/ increased with age. There was also a significant interaction between /ʃ/ accuracy and sound. As shown in Figure 2, the spectral mean contrast between /s/ and /ʃ/ increased with increasing /ʃ/ accuracy.

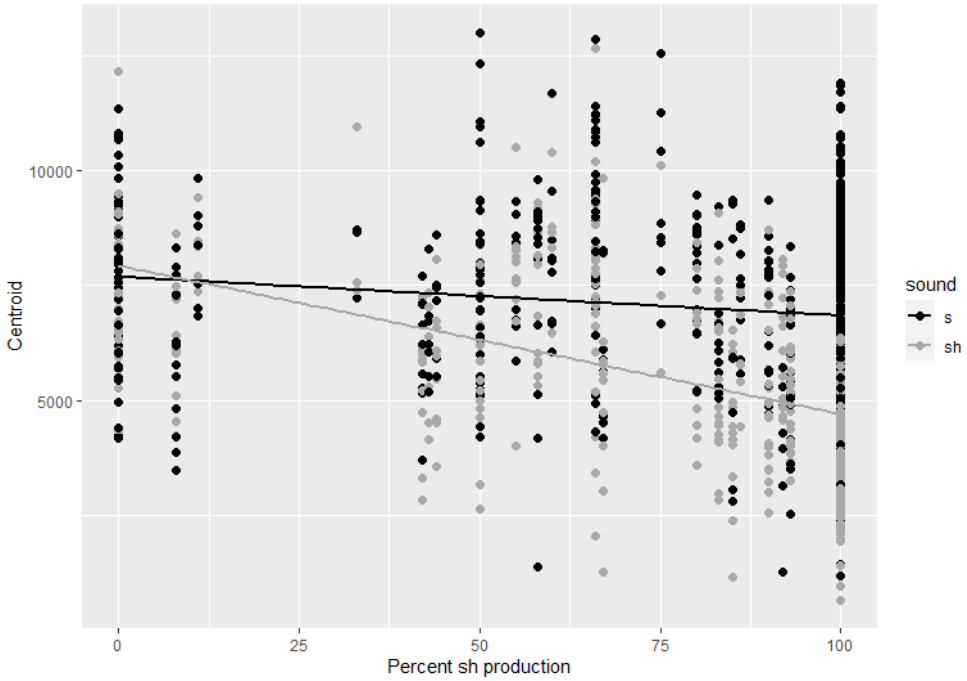

Figure 2. Centroid values for "s" and "sh" according to percent /ʃ/ production (based on phonetic transcription)

Table 3. Best fitting model for factors influencing centroid values of /s/ and /ʃ/

Fixed Effects	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	9274.883	418.215	22.177	< .001 ***
age	-32.467	6.857	-4.735	< .001 ***
gender	-509.540	197.423	-2.581	0.01 *
MonBi	-39.943	195.244	-0.205	0.84
sound	940.912	314.643	2.990	0.003 **
/ʃ/ accuracy	-3.316	3.627	-0.914	0.36
age:sound	-11.894	5.007	-2.375	0.02 *
/ʃ/ accuracy	-19.730	2.757	-7.157	< .001 ***

To obtain additional information on the nature of the contrast, we ran a second model categorizing children into low (0-20%), middle (33-67%), and high (75-100%) [ʃ] producers to examine whether a spectral mean contrast was present for each group. The centroid means for each group of children are shown in Figures 3 to 5. Tukey multiple comparisons indicated that low /ʃ/ producers (n=8) did not make a significant centroid contrast between /s/ and /ʃ/ (t=-.25, p=.99).

The mean values for /s/ and /ʃ/ were 7338.75 (sd=1882.29) and 7361.89 (1725.20). However, the mid (n=15; t=3.5, p=.007), and high (n=57: t=12.85, p<.001) producers did. The mean values for /s/ and /ʃ/ were 7642.77 (2022.59) and 6643.66 (1963.44) in the mid group and 6800.26 (1853.45) and 4728.17 (1411.42) in the high group. The difference between /s/ and /ʃ/ increased with age in the high but not in the mid producers.

Discussion and Conclusion

This study conducted a spectral moments' analysis of /s/ and /ʃ/ in French-speaking children, aged 2;6 to 6;10. The children varied in their mastery of [ʃ] based on phonetic transcription, often neutralizing the distinction between /s/ and /ʃ/. We aimed to determine whether children who did not display any perceptible differences between /s/ and /ʃ/ were nevertheless producing an acoustic contrast in their spectral moments. Our findings indicated that children who were rarely perceived as producing [ʃ] (i.e., accuracy less than 20%) did not distinguish /s/ and /ʃ/ on the basis of spectral moments. These children ranged in age from two to five years. Thus, regardless of age, covert contrast was not evident in their speech. Children who were starting to produce [ʃ] (i.e., accuracy between 33 and 66%) distinguished /s/ and /ʃ/ on the basis of spectral moments. These children were also aged between two to five years, and the magnitude of the centroid contrast was similar across age. Finally, children who had mastery of [ʃ] (i.e., accuracy greater than 75%), exhibited a spectral mean contrast that increased across age. They ranged in age from two to six years. Thus, the findings suggest that a centroid contrast starts to develop in children once they are perceived as producing a certain number of alveopalatal fricatives (e.g., approximately 30%).

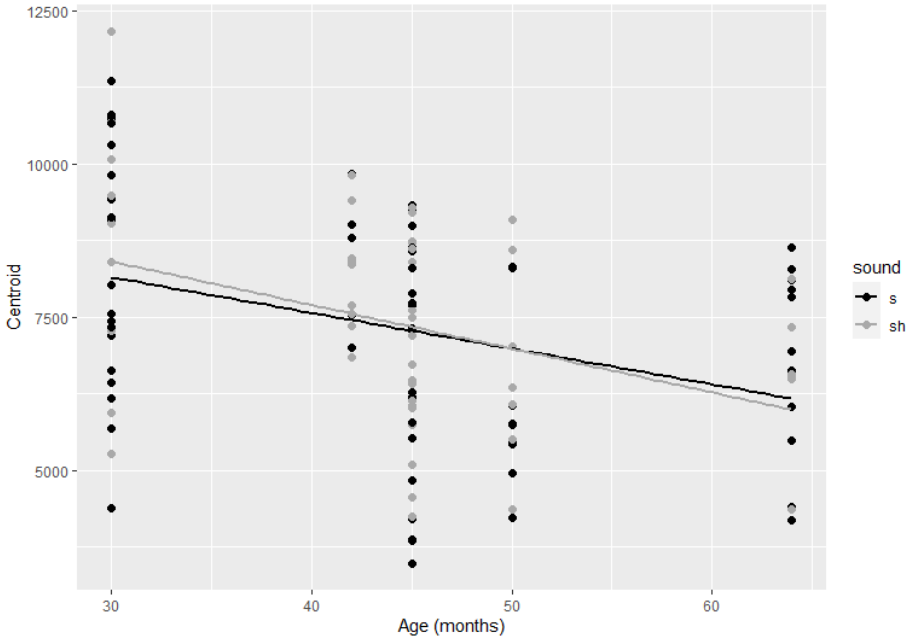

Figure 3. Centroid values for "s" and "sh" in the low [ʃ] producers (n=8) across age

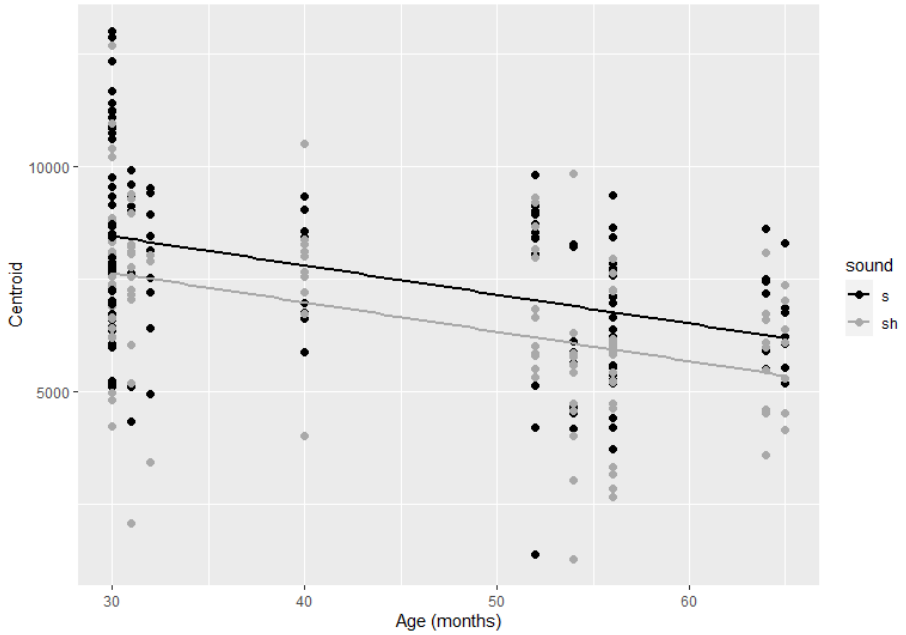

Figure 4. Centroid values for "s" and "sh" in the [ʃ] producers (n=15) across age

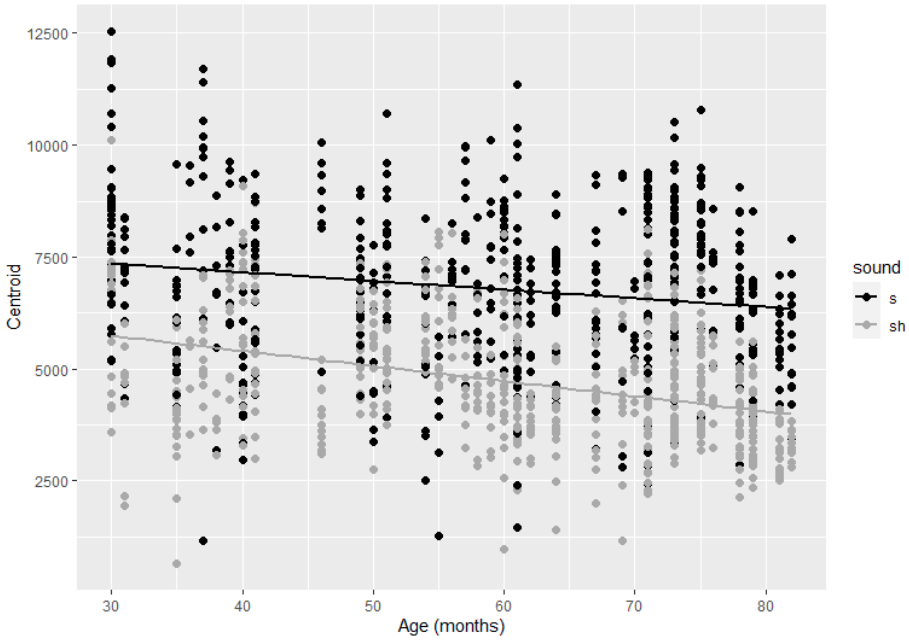

Figure 5. Centroid values for "s" and "sh" in the high [ʃ] producers (n=57) across age

This study has several limitations including the fact that the number of children who were low and middle [ʃ] producers was small in the current sample. The sample included predominantly children who were high [ʃ] producers. The low percent accuracy for [ʃ] evident in Figure 1 stems from the fact that, at ages two to five years, there were children who varied between 0 and 100% production. A sample with a greater number of low [ʃ] producers may have revealed stronger evidence of covert contrast. Furthermore, we concentrated on voiceless fricatives, and the inclusion of voiced fricatives [z, ʒ], which are articulatorily more challenging, may have provided greater evidence of covert contrast, as might have the analysis of other spectral moments (e.g., skewness) apart from the centroid. Nevertheless, our findings revealed that many children display a reliable acoustic contrast between [s] and [ʃ] even though their transcription data suggest that the contrast has not yet been mastered.

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Voice onset time of Japanese stops produced by Shanghainese-Mandarin learners with various Japanese proficiency levels

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Abstract. This study investigates the phonological transfer from bilingual learners' native languages to the target foreign language (FL), focusing on how the current FL proficiency affects the transfer. In a between-subject study, we tested the production of Japanese stops in a paragraph-reading task of 18 Shanghainese-Mandarin learners of Japanese and 9 Tokyo Japanese native speakers. The learners were recruited from first, second, and third-year courses of an undergraduate program in Japanese language at a public university in China. Their production accuracy was measured by means of voice onset time (VOT). The results showed that only the second and third-year learners successfully transferred the word-medial voiced stops from Shanghainese to Japanese and that the first-year learners produced word-initial voiceless stops with an unexpected long VOT. Moreover, the first-year learners even showed an unexpected long VOT in producing word-initial voiceless stops. The results suggest that (a) bilingualism may not help the production of FL sounds in the initial stage of learning even though the target FL shares the same phonemes with one of the learners' L1s, and (b) in foreign language research and teaching, learners' L1 should be defined in a narrow way, which considers the specific variants that the learners are native in.

Keywords: bilingualism; stop; voice onset time; Japanese; Mandarin; Shanghainese; foreign language pronunciation

Introduction

Learners' native languages (L1) and foreign languages (FL) interact in phonetics and phonology. Several theoretical models suggest that the successful transfer from one's L1 to FL is determined by how similar the target FL category is to their L1 category (Flege, 1995; Flege & Bohn, 2021). The similar but non-identical phonemes in an FL are the most challenging to transfer. If the learners cannot build a new category in their FL phonology, they will have to assimilate the FL category to a similar L1 category (Flege, 2003). For example, for Mandarin speakers, the Japanese voiced /b, d, g/ sound like the Mandarin unaspirated /p, t, k/. Therefore, Mandarin-speakers would assimilate the /b, d, g/ to /p, t, k/ in FL speech production (Liu et al., 2019).

Bilingual advantages and disadvantages in FL speech learning

The picture becomes more complex when learners are bilinguals since they may have multiple options to realize the transfer. However, previous research has not yet agreed on the transfer pattern from two L1s to an FL. Some hold that the transfer form learners' both language systems to the FL system should be non-selective and always positive (the Cumulative-Enhancement Model,

CEM, Flynn et al., 2004). Others, by contrast, suggest that the L1-to-FL transfer is selective and is not necessarily helpful (the Typological Primacy Model, TPM, Cabrelli Amaro, 2012).

Empirical research also showed mixed results on how bilingualism affects FL speech learning. On the one hand, bilinguals outperformed monolinguals in nonnative sound discrimination and production abilities after training (Spinu et al., 2018; Tremblay & Sabourin, 2012). Bilinguals also show advantages in perceiving nonnative phoneme contrasts similar to one of their native languages (Antoniou et al., 2015; Enomoto, 1994; Patihis et al., 2015), which suggests a narrow transfer pattern from bilinguals' L1s to FLs. Other studies, however, found that bilingualism was not always helpful, especially in FL speech production (González-Ardeo, 2001; Lloyd-Smith et al., 2017). Therefore, more empirical data are needed to validate the transfer pattern in FL speech production.

Moreover, as learning experience is an important factor in accounting for successful transfer (Flege & Bohn, 2021), the influence of bilingualism may be subject to learners' FL proficiency (Hirosh & Degani, 2018). This study thus recruited Shanghainese-Mandarin bilingual students with various Japanese proficiency levels to investigate how the learners' current FL proficiency interacts with bilingual effects in FL speech learning. We chose the Japanese stops as an index of FL speech sound accuracy to validate our hypotheses.

A comparison of Japanese, Mandarin, and Shanghainese stops

Phonologically, Japanese stops have a two-way contrast in voicing: voiced /b, d, g/ and voiceless /p, t, k/ (Okada, 1999); Mandarin stops have a two-way contrast in aspiration: aspirated voiceless /p^h, t^h, k^h/ and unaspirated voiceless /p, t, k/ (Duanmu, 2007); while Shanghainese (Shanghai Wu, Shanghai Chinese) shows a three-way contrast: voiceless unaspirated /p, t, k/, voiceless aspirated /p^h, t^h, k^h/, and voiced /b, d, g/ (Chen & Gussenhoven, 2015).

However, the phonetic realizations of the stop categories in Japanese and Shanghainese are conditioned by word-internal positions. The phonetic realization of stops can be measured by the voice onset time (VOT, see Abramson & Whalen, 2017). Regarding the voiced /b, d, g/, Japanese can realize them with a negative VOT, but Shanghainese only do so in the word-medial positions. As for the voiceless stops, Japanese /p, t, k/ have longer VOT word-initially than word-medially, while in both Shanghainese and Mandarin, voiceless stops can have either long VOT or short VOT at any position. Therefore, Mandarin monolingual speakers have difficulty learning nonnative voiced stops, which has been validated with many target FLs (e.g., Feng & Busà, 2022; Liu et al., 2019). By contrast, bilinguals who speak Mandarin and another Chinese variant would show different learning outcomes due to the transfer from the specific variants they speak. For instance, Shanghainese-Mandarin speakers are expected to produce Japanese voiced stops more accurately than Mandarin speakers, especially in the word-medial position.

Research Question and Hypothesis

Based on the literature review and the contrastive analyses on the VOT of Japanese, Mandarin, and Shanghainese, we address the following research question: To what extent do the bilingual effects interact with the learners' FL proficiency in the production of Japanese stops?

Our hypotheses are as follows:

- The bilingual speakers would show a native-like pronunciation of the voiced stops in word-medial position due to the positive transfer from Shanghainese, and proficient learners would outperform beginners in transfer.
- The pronunciation of voiceless stops would not be affected by either native language (i.e., Mandarin and Shanghainese).

Methods

Participants

Eighteen Shanghainese-Mandarin bilingual speakers (aged 19-24 years) were recruited from an undergraduate program in Japanese language. They are first, second, and third-year students at a public university in Shanghai, China (n = 6 per course, henceforth, BS1, BS2, BS3, respectively). As the control group, we recruited nine Tokyo Japanese native speakers (aged 20-29 years, henceforth, NJ) from Japan. The BS participants started learning Japanese systematically when they entered university at around 18 years old and had no studying experience in Japan.

Materials and Procedure

The recording took place in a soundproof room. After signing the consent form, which allowed the researchers to collect and process their speech data, each participant read twice the Japanese version of *The North Wind and the Sun* (Okada, 1999) at a natural and comfortable speech rate and a normal volume to the microphone in the booth. The participants did the task individually, and the speech outcome was digitally recorded on an experimental computer using the Recorder program.

Data Coding and Analyses

After the recording, we selected 18 target tokens from the reading materials for the analyses. The tokens were followed by the low vowel /a/, with half of them in the word-initial position and the other half in the word-medial position. We obtained 972 tokens (18 stops × 27 participants × 2 repetitions) in total. However, 169 tokens were spirantized, nasalized or mispronounced due to fast speech, which were impossible to measure the VOT. The remaining 803 tokens were analyzed and reported. In addition, to minimize the influence of speech rate on the VOT, we annotated the duration of the syllable where the target token was located. We divided the VOT of each target token by the syllable duration to obtain a normalized variable, the VOT ratio, for the statistical analyses. However, for descriptive statistics, we will report the original VOT value.

We built a Linear Mixed Effects Model (LMM) to analyze the data. The dependent variable was the VOT ratio, and the independent variables were voicing (voiced vs. voiceless), position (word-initial vs. word-medial), speaker (BS1 vs. BS2 vs. BS3 vs. NJ), and their interactions. As for the random structure, we checked all the possible random slopes/interactions for each of the random intercepts: participant and item. The best-fitting model involved two by-participant random slopes of voicing and position and one random intercept of item. Finally, the significance of the independent variables was calculated with the Type II Wald *chi*-squared test, and the post-hoc analyses that included Bonferroni-adjusted pairwise comparisons.

Results

The mean VOT produced by the three groups of participants across voicing conditions and word-internal positions are summarized in Table 1. An inspection of the data reveals that the NJ realized the voiced stops with a negative mean VOT, although the SD suggests that some items also showed short positive VOT. As for the word-medial voiceless stops, the NJ produced a moderate positive mean VOT. By contrast, the three learner groups (BS1-BS3) generally produced a longer VOT than the NJ in both voiced and voiceless stops.

Table 1. Mean VOT (Standard Deviation) produced by the Shanghainese-Mandarin bilingual learners and Japanese native speakers divided by voicing (voiced vs. voiceless) and word-internal positions (initial vs. medial)

	Voiced stops		**Voiceless stops**	
	Initial	**Medial**	**Initial**	**Medial**
NJ	-4.16 (34.61)	-2.10 (36.55)	40.60 (18.62)	25.76 (10.99)
BS1	19.40 (27.39)	27.80 (25.13)	75.01 (18.85)	38.38 (17.63)
BS2	1.05 (36.51)	21.86 (20.14)	64.26 (26.06)	24.95 (13.53)
BS3	14.06 (30.84)	3.82 (27.71)	61.04 (21.68)	36.83 (14.24)

The LMM analysis revealed a significant two-way interaction of Voicing × Position, χ^2 (1) = 6.32, p = .012, which suggests that the differences of VOT ratio between voiced and voiceless stops varied according to the word-internal position. The post-hoc comparisons can be interpreted in two ways. On the one hand, the participants produced significantly longer VOT ratio for voiceless than for voiced stops at both word-initial (t(15.6) = 5.77, p < .001), and word-medial (t(16.3) = 2.17, p = .045) positions. On the other hand, the participants (both BS and NJ) produced the voiceless stops with significantly longer VOT ratio in word-initial positions than in word-medial positions, t(14.7) = 3.05, p = .008, but the VOT ratio of voiced stops did not differ by word-internal positions, t(16) = 0.44, p = .666.

More importantly, there was a significant three-way interaction of Voicing × Position × Group, χ^2 (3) = 22.3, p < .001. It suggests that the ways in which the VOT ratio contrasted in voicing conditions differed for different word-internal positions and groups of speakers. Post-hoc comparisons revealed two significant contrasts between NJ and BS1. First, in the word-initial position, BS1 produced the voiceless stops with a significantly longer VOT than NJ, t(31.1) = 3.47, p = .009. Second, in the word-medial position, BS1 produced the voiced stops with a significantly longer VOT than NJ as well, t(27.9) = 3.47, p = .002. No other significant contrasts were found.

Discussion and Conclusion

This study investigated the Japanese voiced and voiceless stops produced by Shanghainese-Mandarin bilingual learners with three different proficiency levels (BS1-BS3) in a paragraph-reading task. We assessed the participants' production accuracy by measuring the VOT and comparing the VOT with native Japanese speakers (NJ). Overall, the BS groups and the NJ group showed similar VOT patterns. They made a clear distinction between voiced and voiceless stops in VOT; the voiceless stops had longer VOT in the word initial positions than in the word-medial

positions. This production pattern conforms to the phonetic realizations of the Japanese stops. It seems that the learners have, in general, established the voiced-voiceless contrast in their interlanguage phonology.

Regarding our research question, we hypothesized that the bilinguals would show a native-like pronunciation of the voiced stops in word-medial position due to the positive transfer from Shanghainese, but proficient learners would outperform beginners in transfer. Our data confirmed this hypothesis as BS1 produced the word-medial voiced stops with a significantly longer VOT than the NJ, but the more proficient BS2 and BS3 did not show such a nonnative pronunciation. This suggests that bilingualism may not always be helpful in successful phonological transfer, particularly when learners are at an early stage of learning.

Nevertheless, our data did not support our second hypothesis that learners' FL proficiency would not affect their production of voiceless stops. We found that in the word-initial positions, the BS1 learners produced the voiceless stops with significantly longer VOT than the NJ. Similar findings were also reported for Polish-English learners of French, where the learners did not successfully transfer the short-lag Polish stops to their L3 French due to the influence of L2 English (Wrembel, 2014). These findings suggest that beginners may show more variants in establishing a new category in FL compared to proficient learners.

The current findings have some important theoretical implications. We found that bilingualism was not beneficial in the initial FL learning stage. Hence, even though there is a phonetic overlap between the FL and one of the learners' native languages, the positive transfer is subject to the learners' FL proficiency. Our data thus added supporting evidence to the TPM (Cabrelli Amaro, 2012), which predicts that bilingualism would not always help successful transfer from L1s to FL.

Finally, the current study has some limitations, and future studies might want to further explore the research questions from different perspectives. First, we only included controlled speech to generate predictable speech outcomes. Future studies might want to include more spontaneous measures. Second, the current study did not compare the learning outcome of Mandarin monolingual learners to that of Mandarin-Shanghainese bilingual learners, which should be completed in future studies and analyses. Third, despite voiced stops, there are rich phonological resources in Chinese variants for similar studies, such as the Jiaoliao Mandarin interdental /θ, ð/ and the Cantonese front rounded /œ/. Because these are not phonemes of Putonghua (the so-called "standard Mandarin"), bilingual/bidialectal Chinese students would show different learning outcomes on these phonemes compared to "Putonghua" monolinguals in FL speech learning.

To conclude, despite certain limitations, the current study showed that at the initial stage of learning, bilinguals might not benefit from the phonetic overlap between the FL and one of their native languages. Therefore, it is important to consider learners' native language in research and teaching practice. Finally, the native language should be defined in a narrow sense that consider the learners' dialect.

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The chance of matching gender between French, Greek, and Spanish nouns

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Abstract. Getting the grammatical gender right is one of the challenges that second language learners face. Accuracy depends on the number of genders of the first and second language, the gender match in word translation, and the learner's proficiency level of the second language. When learning a third language, matching word gender becomes even more difficult as both the first and second language play a role. For native French learners of Spanish, experimental work (White et al., 2004) has shown the dependence of accuracy level on proficiency level. In interpreting such results for gender match between two and three languages and in providing a guideline for how difficult it is to get the gender right, the present study computes the chance of gender match in word translation between French, Greek, and Spanish. Specifically, the chance of gender match is calculated for frequently spoken nouns in translation. Trilingual match as well as exclusive and non-exclusive bilingual match is computed for 200 frequent nouns. The effect of which language is the first language, is investigated for both masculine and feminine nouns. Feminine French or Spanish nouns keep gender in Greek much better than masculine nouns, while Greek feminine and masculine nouns match similarly in French or Spanish. The same holds true for trilingual gender match depending on which language is the first language. The chance for bilingual gender match between French and Spanish is 4/5 while the chance between Greek and French or Spanish masculine is 1/3, about 45% lower than feminine. The contrasts are due to a third neuter gender in Greek, the change in Modern Greek gender (mainly from masculine to neuter) from Katharevousa to the contemporary vernacular Demotic Greek, employed in the present study, and the fact that French and Spanish are Romance languages that have two genders.

Keywords: gender; nouns; match; chance; French; Greek; Spanish; bilingual; trilingual

Introduction

Getting the grammatical gender right is one of the challenges that second and third language learners face. Accuracy depends on the number of genders in the languages, gender match in word translation, and learners' proficiency level of the second and third language. For native French learners of Spanish, experimental work (White et al., 2004) has shown the dependence of accuracy level on proficiency level. Even at the low proficiency level, second language learners were at least 80% accurate in identifying grammatical gender. However, the nature of L2 grammar may limit ultimate attainment as shown by Montrul et al. (2008). Their experiments showed that English learners and heritage speakers of Spanish made m61ore gender errors for feminine nouns than for masculine nouns as masculine is the default for Spanish.

In learning French as a second language, Ayoun (2007) showed the significance of the L2 proficiency level of English learners of French. Further, Kupisch et al. (2013) found that German-French simultaneous bilinguals as well as advanced L2 learners successfully acquired gender at 95% or higher.

Learning between Indo-European languages involves several difficulties even when gender is not an issue as is the case of Greek-English (Babatsouli, 2022). Acquisition of gender warrants a separate examination. Learning heritage Greek by children and adolescents of L1 English in Australia was examined by Karayiannis et al. (2021). Compared to gender acquisition by monolingual Greek children (Varlokosta, 2011), both groups lagged behind with the adolescents less so. Errors were attributed to the default neuter gender for children and to the ambiguities of phonological properties of the inflectional suffix for adolescents.

In interpreting such results for gender acquisition in a second or even a third language as well as in providing a guideline for how difficult it is to get the gender right, the present study computes the chance of gender match between French, Greek, and Spanish nouns. While in French and Spanish there are two genders, masculine and feminine, in Greek there is one more gender, the neuter (Setatos, 1974, 1987). Therefore, it will be interesting to compare the chance of matching gender between the two romance languages and each of the romance languages and Greek. Matching gender simultaneously in the three languages will also be computed.

Methodology

Calculations are based on a sample of 200 frequently spoken French nouns. The sample comprises 100 masculine and 100 feminine nouns which were selected from the list of 3000 most common words spoken in French, given in *https://3000mostcommonwords.com*. The sample was then translated into Greek and Spanish and is given in the forthcoming full paper (Sotiropoulou, 2022). An example in the sample is the French feminine noun *mer /mɛʁ/* which translates into the feminine *θάλασσα /ˈθa.la.sa/* in Greek and the masculine *mar /'maɾ/* in Spanish. Another example is the French masculine noun *jour /ʒuʁ/* which translates into the feminine *μέρα /ˈmɛra/* in Greek and the masculine *día /d̪i.a/* in Spanish.

Results

In translation, the 200 frequently spoken nouns in French (100 masculine and 100 feminine) result in 53 masculine, 134 feminine, and 113 neuter nouns in Greek and in 100 masculine and 100 feminine nouns in Spanish, not all Spanish matching with French. The gender match cumulatively for masculine and feminine between languages is shown as Venn Diagram 1a. The gender match for masculine and feminine nouns is shown in Diagrams 2b and 2c, respectively. From these three diagrams, the chance of matching gender for frequently spoken nouns is computed and shown in Table 1.

In Table 1, a distinction is made between the native language and the second language. The native language is shown in column 1 and the chance of matching its gender in the second language is given in the last three columns. The chance of matching gender exclusively in the second language but not in the third language is given in columns 2, 3, 4. The fifth column shows the chance of matching gender in all three languages. Rows 2, 3, 4 given the chance of matching cumulatively

masculine and feminine gender. For this, the two romance languages match gender at 81%, while Greek and French or Greek and Spanish match gender at 40% or 37%, respectively. Exclusive matching contrasts as well; between the romance languages it is at 47% while between Greek and a romance language is at 6% and 3% for French and Spanish, respectively. The contrast for exclusive matching is mainly due to masculine gender as may be seen in rows 5-10. There are differences in gender matching depending on which is the native language and which is the second language. The largest difference is for masculine nouns between Greek and a romance language.

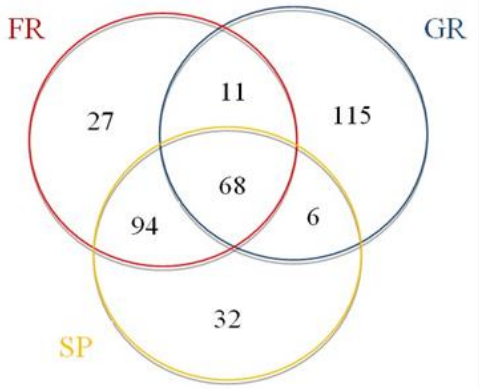

Figure 1a. All-gender match between French, Greek, and Spanish nouns

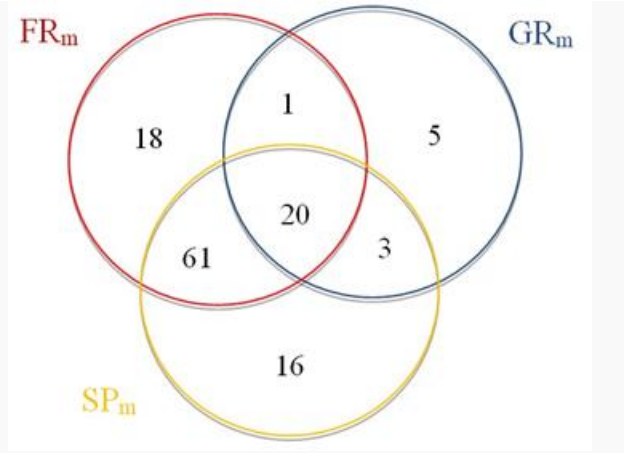

Figure 1b. Match between French, Greek, and Spanish masculine nouns

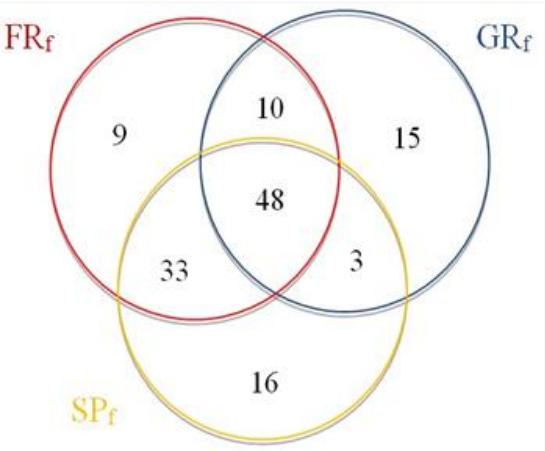

Figure 1c. Match between French, Greek, and Spanish feminine nouns

For native French learners of Greek, the chance of matching masculine gender is only 21%, similar to native Spanish learners of Greek (23%). In contrast, however, this chance increases to 72% or 79% for native Greeks learners of French or Spanish masculine nouns, respectively. For feminine gender match, the difference in the chance between Greek and Spanish native speakers learning each other's language is not as large but still quite large: 67% vs. 51%. The same is true for between Greek and French feminine nouns: 76% vs. 58%. However, between the romance

languages, the chance of gender match is independent of the native language and of whether the gender is masculine or feminine, at 81%. Last, matching in all three languages cumulatively for both genders is at 34%. The chance of matching masculine gender in all three languages is much lower than matching feminine gender for native French or Spanish learners (20% vs. 48%) but not for native Greek learners (69% vs. 63%).

Table 1. The chance of matching gender for nouns

match/ from x	FR/x only	GR/x only	SP/x only	FR/GR/SP	FR/x	GR/x	SP/x
FR	14%	6%	47%	34%	100%	40%	81%
GR	6%	58%	3%	34%	40%	100%	37%
SP	47%	3%	16%	34%	81%	37%	100%
FR m	18%	1%	61%	20%	100%	21%	81%
GR m	3%	17%	10%	69%	72%	100%	79%
SP m	61%	3%	16%	20%	81%	23%	100%
FR f	9%	10%	33%	48%	100%	58%	81%
GR f	13%	20%	4%	63%	76%	100%	67%
SP f	33%	3%	16%	48%	81%	51%	100%

Bilingual Similarity

The data used provide the opportunity of obtaining bilingual gender similarity independently of which language is the first language, that is, the source language from which nouns translate into the second language. The Sørensen-Dice similarity coefficient (Dice, 1945; Sørensen, 1948) is employed to obtain bilingual gender similarity. This similarity coefficient is a statistical measure defined as twice the ratio of common elements in two samples to the sum of all elements in the samples. Table 2 shows the computed bilingual gender similarity coefficients. The first column comprises the three language pairs, the second column depicts the cumulative (masculine and feminine) gender bilingual similarity coefficients, the third column shows the bilingual similarity coefficients for masculine nouns, while the fourth column gives the corresponding coefficients for feminine nouns.

Table 2. Bilingual gender similarity*

noun type/ L1/L2	m+f	m	f
FR/GR	40%	33%	66%
FR/SP	81%	81%	81%
GR/SP	37%	36%	58%

* $= 2\,|L1 \cap L2| / (|L1| + |L2|)$

For both genders together, the bilingual similarity coefficient between Greek and French or Spanish is half of that between French and Spanish (40% or 37% vs. 81%). This coefficient is slightly larger than for masculine nouns and much smaller than for feminine nouns. French-Greek

masculine similarity coefficient is at 33%, 50% lower than the feminine similarity coefficient, and Spanish-Greek masculine similarity coefficient is at 36%, 38% lower than the feminine similarity coefficient. There is no difference between masculine and feminine similarity coefficients for French-Spanish, being at 81%.

Discussion

When learning a second language, at least in early stages, it is usual to translate from the native language to the second language. Published research, which is discussed in the introduction, has shown that accuracy in identifying grammatical gender in a second language depends on the learner's proficiency level. The present study aimed at contributing to the understanding of such published results by investigating the chance of matching gender between a native language and a second and even a third language. Furthermore, the present results provide a guideline for the degree of difficulty involved in learning grammatical gender in another language. Three languages are studied here: two romance languages, French and Spanish, and Modern Greek, which is also an Indo-European language. French and Spanish have two genders, with the masculine being the default gender, while Modern Greek has three genders, with neuter being the third gender, the default gender in contemporary vernacular Demotic Greek. Because the default gender changed historically from masculine to neuter in Greek, from Ancient Greek and Katharevousa Modern Greek to vernacular Demotic Modern Greek (Setatos 1987; Kofod, 1992), it is expected that masculine gender match between Greek and French or Spanish will be lower than feminine match. The computed bilingual gender similarity coefficient, which is independent of which is the first or second language, clearly surfaced this.

The present study also investigated the effect of which one of the two or three languages is the first language. When French or Spanish is the first language, trilingual masculine match is at 20%, much lower than the trilingual feminine match at 48%, owing it to the mainly masculine to neuter gender change in Demotic Modern Greek. However, when Greek is the first language, trilingual masculine and feminine match is similar at about 66%. Analogously, for bilingual match, when the first language is French or Spanish, masculine match with Greek is at 22% while feminine match is at 58% or 51%, respectively. On the other hand, when Greek is the first language, masculine matches somewhat better with Spanish than with French (79% vs. 72%), while feminine matches somewhat better with French than with Spanish (76% vs. 67%). Conclusively, when the first language is Spanish or French masculine matches much better than feminine with Greek, but when the first language is Greek, feminine matches slightly better than masculine with French or Spanish. The results imply that the source language of a noun in a second language affects the chance of gender match between the source language and the second language. This is investigated in the forthcoming full paper (Sotiropoulou, 2022).

Summary and Conclusion

The chance of trilingual cumulative (masculine and feminine) gender match between French, Greek and Spanish frequently spoken nouns was obtained as 1/3. For individual gender match, feminine or masculine, the chance depends on which language is the first language. The chance for both types of nouns is much higher for feminine than for masculine trilingual match when the first language is French or Spanish, and it is about the same when the first language is Greek. The same holds true for bilingual gender match between French or Spanish and Greek. The chance of

bilingual gender (masculine or feminine) match between French and Spanish is 4/5 while the chance between Greek and French or Spanish masculine is 1/3, about 45% lower than feminine. That is why a bilingual similarity coefficient that is independent of the order of languages (native or second) was also obtained to characterize gender similarity between two languages. The contrasting chances of gender match are attributed to French and Spanish having two genders, with the masculine being the default gender, while Demotic Modern Greek has three genders, with neuter being the default third gender. These results put in perspective experimental results in the literature for learners of Spanish from native French or learners of French from native Spanish. Furthermore, they highlight the degree of difficulty in learning gender in French or Spanish from native Greek or in Greek from native French or Spanish. It is aimed that the present study can serve as a guide in computing the chance of gender match between any two or three languages that may or may not have the same number of genders. Last, the results obtained here may guide practices in bilingual education.

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Family language policy: An analysis of language use patterns and factors enabling active use of heritage languages in a multilingual family

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Abstract. Studies on family language policy (FLP) and bilingual first language acquisition (BFLA) have demonstrated that not all children exposed to two or more languages from birth speak all of their languages. De Houwer (2007) found that successful transmission of a minority language is more likely to occur when both parents provide input in the minority language, and at most, one of the parents speaks the societal language. This finding suggests that in transnational families where each parent speaks a different minority language and both parents speak the societal language, the task of language transmission becomes a significant challenge.The current study explores the language use patterns of a multilingual family raising their quadrilingual child in a 'double minority language' (Fukuda, 2017) situation and investigates the factors that affect the successful transmission and the active use of minority languages in their home. Each parent speaks their heritage language -the mother Japanese and the father Armenian- with their eight-year-old daughter. The common language between the family members is the societal language, Turkish, and the international language, English. Naturalistic audio data of family conversations are analyzed to demonstrate the language use patterns of the parents and the child's language choice. The findings are succeeded by interviews with family members, including the child, to identify the relationship between their ideologies and beliefs about languages and their actual language use. The results demonstrate that heritage languages are used overwhelmingly in child-parent interactions. Although the parents communicate in the societal, and the international languages, the child demonstrates a preference to use the heritage languages when addressing her parents. The qualitative results indicate that in this multilingual family, the double minority context, parents' language ideologies, strong impact beliefs, realistic expectations, the influence of other caregivers, as well as child agency are influential factors on their FLP, the successful transmission, and the active use of heritage languages.

Keywords: family language policy (FLP); bilingual first language acquisition (BFLA); bilingualism; multilingualism; heritage language maintenance

Introduction

Studies of family language policy (FLP) and bilingual first language acquisition (BFLA) fields have demonstrated that not all children exposed to two or more languages from birth speak all of their languages. Language transmission is a significant challenge in linguistically mixed marriages where each parent speaks a different minority language while the parents communicate in the

societal language. This study explores the language use patterns of a transnational, multilingual family raising their child in a 'double minority language' (Fukuda, 2017) situation and investigates the factors that affect the successful transmission, and the maintenance of minority languages in their home holistically.

Background

Family Language Policy (FLP)

Raising bilingual children requires great efforts on the minority language speaking parents' side; the child's linguistic environment and the family language policy are determinant factors in the transmission of the minority languages. Family language policy (FLP) is defined as explicit and implicit language practices within the home among family members (King et al., 2008), and studies in the field deal with the transmission and the maintenance of minority languages within the family.

Each family has its own standards for speaking specific languages; and family language policies are shaped by various factors. Language ideologies, referring to 'a set of beliefs concerning a particular language, or possibly language in general' (King, 2000), determine family language policies. Parental language ideologies affect parents' interactional strategies with their children and children's language outcomes (King & Fogle, 2013). However, parents' reported language ideologies may not necessarily match their actual language practices. Parental 'impact beliefs' (De Houwer, 2011), defined as parents' opinions about their capacity and duty to transmit the minority language to their children, affect parents' engagement and investment in their children's language learning and improvement (De Houwer, 1999).

Besides parents, grandparents and other caregivers also influence children's bilingual development. A lack of support from monolingual grandparents speaking the societal language may result in the abandonment of the minority language (Leist-Villis, 2004).

Another influential factor is child agency. In the FLP context, child agency refers to children's active role in making choices about family language use patterns (King & Fogle, 2013). A growing body of FLP work has investigated children's active role in socializing their parents in particular language practices (Gafaranga, 2010; Tuominen, 1999). Tuominen (1999) demonstrated that school-age children socialize their parents into certain language practices instead of being socialized by them. Family language policies are affected by children's language practices and children are active participants in shaping family language practices.

Factors affecting children's language choice

Bilingual children's language choice is determined by a variety of factors. De Houwer (1999) reported that her young English and Dutch bilingual subject, Kate, separated her two languages according to the interlocutor. However, unlike Kate, Lanza's (1992) subject Siri frequently engaged in language mixing. Lanza (1992, 1997) found that parental discourse strategies are also determinant in a two year old bilingual child's language choice. Mishina-Mori (2011) provided further evidence that the negotiation style of the parent is an influential factor in a child's language choice.

Nakamura's (2018) investigation of two bilingual school-aged children showed that parental discourse strategies contributed to the children's receptive bilingualism. Furthermore, studies focusing on older children's language choice have reported children's preference to use the societal language and their active role in shaping the FLP (Caldas & Caron-Caldas, 2000; 2002; Gafaranga,

2010; Tuominen, 1999). Caldas and Caron-Caldas' (2000; 2002) investigation of their bilingual children's language preference showed that besides the family, society in the broadest sense has a significant role in determining whether the home language will be spoken. Gafaranga (2010) looked specifically at children's role in shaping family language use and language shift and found that in child-parent interactions, children were the ones to negotiate to switch to the societal language.

In the case of trilingual children, De Houwer's (2003) survey of families raising trilingual children showed a strong correlation between the presence of societal language in parental input and the lack of children's active trilingualism. On the contrary, Fukuda's (2017) survey of Japanese-Catalan parents raising their children in Spain showed that societal language use among parents did not impede heritage language use between parents and the children.

The Study

Research in the field has overwhelmingly reported on language use patterns of families with one minority language-speaking parent and one parent who is a native speaker of the societal language. On the other hand, studies with families raising trilingual children have shown inconsistent results regarding the effects of societal language use at home. There are several gaps in the existing literature on transnational families where parents speak different native languages while the societal language is the common language among family members. In addition, FLP research reporting on bilingual school-age children has overwhelmingly reported children's preference or shift to the societal language and their use of resistance strategies (Gafaranga, 2010; Tuominen, 1999; Caldas & Caron-Caldas, 2000; 2002). There is a lack of research on older children who actively use their home languages and the factors that affect their active multilingualism.

Research Questions

1. How is a quadrilingual elementary school child's language choice related to the language use patterns of her parents?
2. What factors and beliefs influence each family member's language choice and the family language policy in a transnational, multilingual family?

Method

A multilingual, transnational family residing in Turkey took part in this study. The participating mother is a native Japanese speaker; she is fluent in English and the societal language, Turkish. The father belongs to the Armenian minority community in Turkey. He is a native speaker of Armenian and Turkish, and he is fluent in English. Their daughter Alice (pseudonym) is an only child who was born and raised in Turkey. Alice's parents have applied the one parent-one language strategy since her birth. Alice's father addresses her in Armenian, and her mother has addressed her in Japanese and English since she was born. The parents communicate with one another in English and Turkish. Alice attends an Armenian minority school where she is exposed to Armenian, Turkish, and English. She has also attended the Japanese Saturday School since she was a first-grader.

Data Collection

Naturalistic family interactions, that take place in the family's home when all three family members are present, were audio recorded by the mother. The audio data collection starts when Alice is at the age of 7;10, and ends at 8;5. A total of eight sessions totaling 58 minutes were recorded over eight months. Out of eight recordings, seven sessions were analyzed for this study.

Upon collection of naturalistic audio data, a semi-structured intensive interview was conducted with the parents to provide in-depth insight into their thoughts, feelings, and beliefs about the use of minority languages within their family and their child's multilingualism. The interview was both audio and video recorded. Notes were also taken during the interviews.

In order to elicit the child's views, the language portrait (Busch, 2006) was chosen as a suitable tool for a child's mode of expression (Busch, 2012). A language portrait is a body silhouette that a multilingual child is asked to color; each color represents the child's languages. Figure 1 illustrates the body silhouette (Busch, 2018) Alice was asked to color. Upon completion, she was asked to talk about the portrait verbally to her parents; the mother recorded her descriptions.

Figure 1. Template of a body silhouette (Busch, 2018)

Transcription and Coding

The audio recordings were transcribed based on the CHAT format (MacWhinney, 2000), and the unit of analysis was the utterance. The quantitative analysis was conducted on the Unix Shell Script program ("What is a shell?", 2020). The parents' interview data were transcribed verbatim right after the interview. The transcribed data were coded, and the qualitative analysis was conducted based on the grounded theory approach (GTA) (Glaser & Strauss, 1967; Charmaz, 2014).

Results

Figure 2 gives an overview of the mother's and Alice's language choice in conversations with each other. The results show that 88.94% of Alice's utterances addressed to her mother were Japanese, whereas 78.95% of the mother's utterances addressed to Alice were Japanese. The mother used 8.05% English to Alice; however, Alice's English utterances to her mother made up only 4.15%. The mother used 12.69% Mixed utterances when addressing Alice, whereas Alice's Mixed utterances to her mother made up only 6.91%.

Figure 3 illustrates language choice in father-child interactions. 90.77% of Alice's utterances directed to her father were Armenian. The father's language choice in interactions with Alice was Armenian 96.97% of the time. On the other hand, 7.69% of Alice's total utterances to her father

were mixed, and only 1.54% of Alice's utterances to her father were English. The father never addressed Alice in Japanese, English, or Turkish, and his mixed utterances to Alice made up only 3.03%.

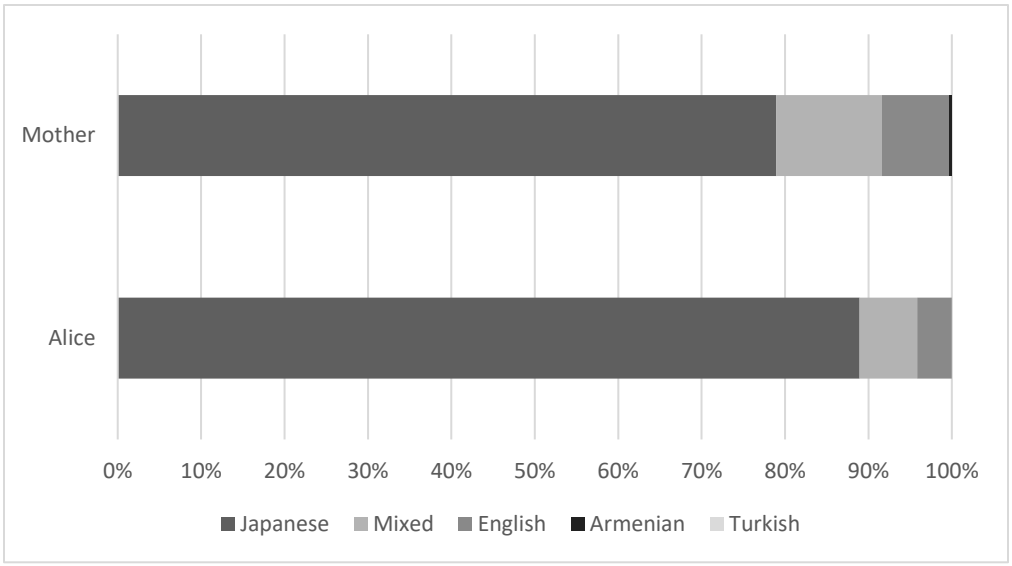

Figure 2. language choice in mother-child interactions

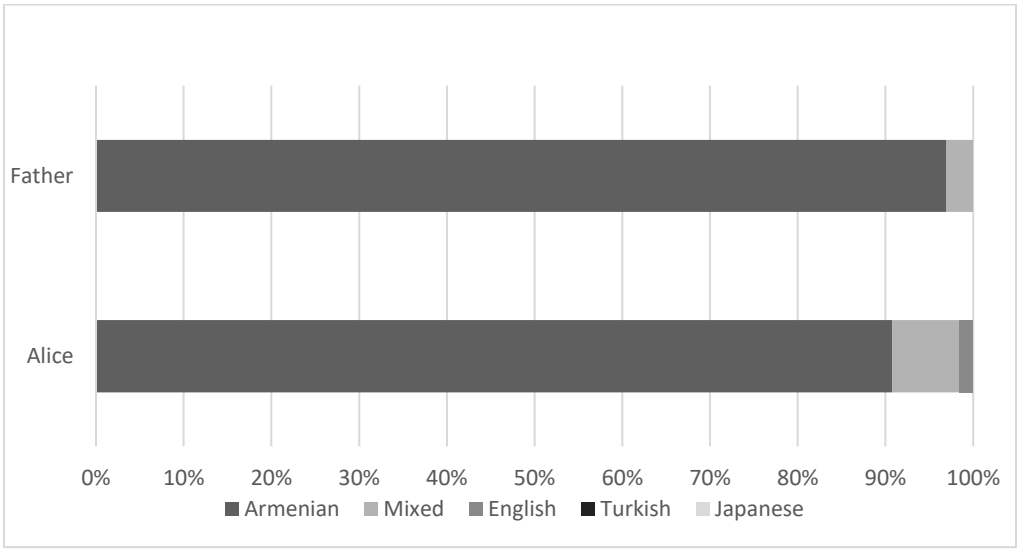

Figure 3. Language choice in father-child interactions

The analysis of the parents' interview suggests that five main categories were influential in their language practices and family language policies: strong impact beliefs, language ideologies, the influence of extended family members, parents' realistic expectations, and child agency. These findings correlate with the parents' actual language choice in interactions with their child. Both the mother and the father predominantly used their heritage languages when addressing Alice.

Although the mother used English along with Japanese in interactions with Alice, the use of the societal language was minimal between child-parent interactions.
On the other hand, Alice described elements of her multilingual experiences through a language portrait (Busch, 2006). Alice completed the language portrait and discussed it with her mother. Figure 4 shows the language portrait created by Alice when she was 8 years and 11 months old.

Alice's language portrait shows that Alice portrays her languages separately; but, all four languages are a part of her body. Alice's visual representation of her linguistic repertoire, as well as her metalinguistic comments in family conversations, demonstrate that she is aware of her multiple linguistic competencies. She portrays her languages separately, yet she sees her identity as multilingual and portrays herself as such. Alice prefers to address her parents in their heritage languages as multilingualism is a fundamental part of her identity.

Figure 4. Alice's language portrait

Discussion

The quantitative analysis showed that heritage languages are overwhelmingly used in child-parent interactions. Both parents have created a monolingual context in addressing Alice, and Alice's language choice is reflective of her parents'. The use of societal language at home does not hinder the use of heritage languages in child-parent interactions.

The qualitative analysis demonstrated that parental language ideologies and strong impact beliefs were the most influential factors in the FLP. The parents firmly believed that the survival of the minority languages depended on speaking them, and transmitting the minority languages was the parents' duty. In addition, the parents were confident in their capacity to transmit their languages to their child. Besides applying the one parent-one language strategy, they provided the linguistic environment necessary for developing her heritage languages.

The support of both paternal and maternal grandparents was influential. the grandparents addressed Alice in their native languages, respectively. This increases the amount of input in Alice's heritage languages and makes it necessary for her to use the languages to communicate with them. Plus, the grandparents were supportive of the child's multilingual upbringing.

The parents' realistic expectations affected the FLP positively. The parents stated that they did not expect their child to have high linguistic proficiencies in her languages. Plus, they were aware that her preferences could also change with her growing age.

Unlike studies reporting on school-aged bilingual children's preference of the societal language, this study provided an example of a multilingual school-aged child who practices her agency towards using heritage languages. Alice portrayed her languages separately, meaning that languages are represented from a monoglossic perspective as a sum of skills (Melo-Pfeifer & Schmidt, 2012), which could be related to how she interacts with languages in her life (Melo-Pfeifer, 2017; Soares et al., 2020). However, her meta-linguistic comments and her language portrait revealed that she identifies herself as multilingual; this explains why Alice prefers to address her parents in their heritage languages.

The results of the current study show that even though the societal language is one of the common languages among family members, its use does not threaten the use of heritage languages in child-parent interactions. This finding supports Fukuda's (2017) reports that the 'double minority context' enables the transmission and maintenance of the heritage languages. The parents do not identify themselves as a part of the mainstream society; even if the child uses Turkish at school and with her friends, it does not dominate the family environment. Thus, language ideologies, language use patterns, and the child language outcomes in transnational families living in a host country should be considered differently from families with one minority language speaking parent. Having two minority languages may give each language almost equal status, with no hierarchy between the languages. Double minority situations may be enabling the maintenance of the heritage languages within the home.

Conclusion

Existing research on school-aged bilingual children has reported on children's preference to use the societal language. This study has provided a unique investigation of a quadrilingual school-aged child actively using her heritage languages. The findings of this study show a close relationship between family members' language ideologies, beliefs, and their actual language choice, i.e., the active use of minority languages. However, this study represents the findings of a case study; further longitudinal FLP studies on multilingual children are necessary to provide a better understanding of influential factors that enable the successful transmission and maintenance of minority languages in multilingual families.

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Child-directed speech in a native vs. a non-native language. A cross-linguistic comparative study

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Abstract. Child language development is a long-term process critically dependent on the language input the child is exposed to, because without it no language acquisition takes place (Pearson, 2007). Parental speech is the most important source of language behavior for children and is at the same time the goal gradually reached by children in the process of acquisition (Slančová, 2018). When talking to little children, parents and caregivers generally communicate in a special way, labelled as child-directed speech (CDS). Its typical features include a higher pitch and exaggerated intonation (Corie, 2019) as well as slower pace of speech and simplified lexis (Spáčilová, 2018). But what happens when a mother alternates two languages (native and non-native) in communication with her children? This paper examines child-directed speech of a Slovak mother regularly speaking both Slovak and English to her children (aged 4;8 and 1;6) in order to make them bilingual. Since English is not her native language, this type of bilingualism is referred to as intentional bilingualism (Štefánik, 2000). The analysis is based on the self-observation of the mother-researcher, drawing upon the audio recordings of the everyday interactions with her children in both languages. It is focused on the linguistic differences of CDS in the two languages (e.g., diminutives as part of CDS contrast significantly in Slovak and English; Slovak having a much wider range of diminutive productivity than English), as well as the characteristics of CDS related to the mother's use of both her L1 and L2. The aim of this paper is to describe the investigated features of CDS in both languages and to demonstrate the impact of a native vs. non-native language on the use of CDS.

Keywords: diminutives; bilingual first language acquisition; child-directed speech

Introduction

Parental speech is the most important source of language behaviour for children and it is at the same time the goal gradually reached by children in the process of acquisition (Slančová, 2018). When talking to small children, parents and caregivers generally communicate in a special way labelled as child-directed speech (CDS). It is a specific type of microsocial communication register, the form of which is conditioned by the child's social role at an early age (Slančová, 2018), and which typically involves a high degree of emotional engagement (Ondráčková, 2010).

CDS has a number of distinctive characteristics that facilitate language comprehension and acquisition (Saint-Georges et al., 2013). They can be categorized according to various perspectives but in this study are classified into 5 categories:

1. prosodic: exaggerated intonational contours, slower pace, higher pitch, hyperarticulated vowels (e.g., Burnham et al., 2002; Cole & Flexer, 2020; Harris, 2020; Saint-Georges et al., 2013; Spáčilová, 2018),
2. grammatical: shorter sentences, a lower mean length of utterance, more single words, fewer complex sentences, a large number of questions and imperatives, symbiotic plural, shifts in persons (e.g., Harris, 2020; Soderstrom et al., 2008; Spáčilová, 2018),
3. lexical: use of euphemizing lexis – diminutives, euphemisms, hypocoristic and familiar names, interjections and onomatopoeic expressions (e.g., Saint-Georges et al., 2013; Spáčilová, 2018),
4. semantic: topics identified in the child's talk, objects and events in the immediate surroundings (Harris, 2020),
5. discourse: a high frequency of deictic utterances, self-repetitions, imitations (expansions) of the child's language (see e.g., Newport, Gleitman & Gleitman, 1977; Saint-Georges et al., 2013; Cole & Flexer, 2020; Harris, 2020).

The debate about native skills vs. non-native skills and the different input they provide have always been a topic of debate. However, studies focusing on CDS in a native vs. a non-native language usually involve bilingual communities. The specificity of this paper consists in the fact that it concerns a single bilingual family in which both a native and a non-native language are intentionally spoken by one of the parents in an otherwise monolingual environment, similarly to Babatsouli (2013).

Method

Aims and Research Questions

The aim of this study is to examine the impact of a native vs. a non-native language on the use of CDS, focusing on the parallels and differences in the overall characteristics of the language produced in both languages during the same amount of time as well as the frequency and variability of four aspects: euphemizing lexis, speech density, complexity, and fluency. In the context of the research aim, the following research questions were formulated:

1) Does CDS maintain its distinctive features even when a non-native language is spoken?
2) What is the difference between the CDS in a native vs. a non-native language with regard to the use of EL and speech density, complexity and fluency?

Participants and Family Language Policy

The participants in this study are a bilingual mother, researcher with her two male infants (INF1 and INF2) aged 5 and 2 years. The family lives in Slovakia, both parents being Slovaks with a university degree. However, English is a late acquired second language of the mother (from the age of 10 via school instruction), a proficient speaker of it, who uses both her native and non-native language in communication with her children in order to make them bilingual. She regularly alternates the two languages in the home, and since English is not her native language, this type of bilingual upbringing is referred to as intentional bilingualism (Štefánik, 2000).

Data Collection

The data collection comprises audio-recordings of the mother's interactions with her children. The recordings were obtained in the natural home environment, and they reflect spontaneous communication between the mother and her children in standard situations, such as eating, washing, playing, waking up and going to sleep. The language sample includes 2 hours of dialogues in Slovak and 2 hours in English and the age span of children during the recording process was 3;10 & 4;7-4;11 for INF1 and 0;8 & 1;5-1;9 for INF2. Files were transcribed manually by the mother-researcher and further analyzed, i.e., scores and rates were calculated subsequently.

Results

General Characteristics of CDS in a Native vs. a Non-native Language

CDS inevitably differs from adult-directed speech (ADS) with regard to the specificity of its prosodic, grammatical, lexical, and semantic and discourse features. The analysis of the language samples collected for this research revealed that although the quantity and quality of the individual CDS features might differ in a native and a non-native language, they still occur in both. It is thus evident that regardless of speaking a foreign language, the interaction with a child urges the caregiver to adjust his/her speech to the needs and abilities of the communicative partner. During the analysis, CDS features were detected in both languages and at all the mentioned language levels.

Euphemizing lexis

The increased use of euphemizing lexis is one of the typical features of CDS and is related to the speaker's emotional bond to the child. It is implemented especially via euphemization, diminutivization and emotiveness of the expression (Spáčilová, 2018).

Table 1. Percentage of euphemizing lexis in mother's language samples

Language	Diminutives	Euphemisms	Hypocoristic and familiar names	Interjections and onomatopoeic expressions	Total euphemizing lexis
English	0.11	0.18	3.83 (1.62)	2.96	7.1 (4.88)
Slovak	1.61	0.32	4.58	1.83	8.35

The percentage of euphemizing lexis in mother's two languages shows slight differences. Although the rates of euphemisms and interjections are rather low, they are still moderately higher in her native language. Hypocoristics also prevail in the native language, with an even greater difference when the pure English expressions (the number in brackets) are compared. However, the rate of interjections unexpectedly predominates in the non-native language. A possible cause of this fact can be related to the high frequency of diminutive and hypocoristic formations in Slovak. Since these items naturally prevailed in mother's Slovak, she might have tried to compensate for it in the available English category of euphemizing lexis, i.e., in her use of interjections. Thus, the total 1-3% difference in mother's euphemizing lexis (depending on the criteria) might be rooted in the languages themselves, besides mother's language proficiency.

Diminutives

The percentage of diminutives in mother's language samples is 0.11% in English and 1.61% in Slovak. The difference in the frequency of their use is thus not very considerable. Nevertheless, it should be noted that the productivity of diminutives in each of these two languages differs considerably. In English, diminutives are primarily formed analytically by using the lexical element little, but it also possesses a subtle inventory of diminutive suffixes, for forming synthetic diminutives. However, they can be applied to a small number of nouns exclusively (cf. Kempe et al., 2007). By contrast, there is a great variety of diminutive suffixes in Slovak, where diminutives are formed solely by derivational suffixes and also mark gender distinctions. Slovak is also one of many languages that have a much wider range of diminutive productivity than English (cf. Kempe et al., 2007). It allows diminutivization not only in nouns but also in adjectives, adverbs and verbs. The described difference of diminutivization in the two languages leads to a logical conclusion that it generally occurs much more frequently in Slovak than in English. Thus, the percentage of diminutives prevails naturally in Slovak.

Euphemisms

The present study understands euphemisms as meliorating expressions with a positive expressive meaning (Brestovičová, 2018). Contrary to diminutives, they do not (have to) include a diminutivizing suffix, e.g., papať 'eat', wee. The percentage of euphemisms in mother's CDS is not very significant; 0.18% in English and 0.32% in Slovak. The difference between the languages is thus minimal.

Hypocoristic and Familiar Names

The percentage of hypocoristics and familiar names shows two items in mother's English – 3.83% (1.62%). Since she used the Slovak hypocoristic forms of the children's names even when speaking English, the first number is higher because these forms are included. This can be viewed as evidence of dominance of mother's native language – Slovak, which is quite natural. However, it might also be caused by the fact that Slovak (similarly as in case of diminutives) has a much wider range of hypocoristic endings. The second number in brackets contains only pure English hypocoristic forms, including the truncated version of the name Alexander → Alex, as it can occur in both languages. The percentage of Slovak hypocoristics and familiar names is only slightly higher – 4.58%, even when compared to both possible percentages of the English ones.

Interjections and Onomatopoeic Expressions

Despite a greater variation in the occurrence of mother's Slovak interjections compared to the English ones, the rates are surprisingly contradictory. Within the euphemizing lexis, this category is the only one in which English prevails over Slovak – 2.96% vs. 1.83%. Although the difference is not very significant, it is still valuable as for the comparison of a native and a non-native language, because it hints to a likely subconscious effort to compensate for the smaller range of possibilities within the other three categories of euphemizing lexis in English as well as to a conscious effort to make the speech fluent and natural.

Speech Density, Complexity and Fluency

While the examination of euphemizing lexis concentrated more on the lexical aspect of mother's CDS, the 3 following categories – speech density, complexity and fluency involve mainly

syntactic and discourse considerations. When analyzing the transcripts, utterance boundaries were determined based on prosodic, syntactic and semantic/discourse factors. The considerations were decided on a case-by-case basis, and the criterion of a multiclause utterance was that it had to contain at least two predicates and at least one subject, similarly as in Soderstrom et al. (2008).

Speech Density

As can be seen in Table 2, the density of mother's speech did not differ very much in her two languages. She produced slightly more words in Slovak but a few more utterances in English. The higher number of English utterances might be associated with the complexity of mother's CDS, since her speech comprised more multiclause utterances in Slovak vs. more one-word utterances in English, as described in the next section. The higher percentage of English one-word utterances might thus be the cause of her overall higher number of English utterances. The difference between mother's average and highest number of words per minute in the two languages was also minimal, so it can be concluded that speaking a native or a non-native language made no substantial difference in the density of mother's CDS, despite showing a subtle advantage for the native language.

Table 2. Density of mother's speech

Language	Total number of words	Average number of words/minute	Highest number of words/minute	Total number of utterances
English	5605	46.7	104	1116
Slovak	5711	47.59	118	1045

Speech Complexity

Multiclause utterances show a considerable difference (more than 9%). Being the most explicit indicator of speech complexity, they demonstrate a sure, though still not very striking, advantage of the native language. Correspondingly, one-word utterances prevail slightly in English and two-word utterances prevail somewhat in Slovak. However, the difference of 2-3% can still be considered marginal (cf. Spáčilová, 2018), albeit the subtle differences in the individual items make a homogenous picture of this aspect. The MLUw score is almost the same in both languages, which reconciles and unifies the previous differences. To sum up, mother's CDS was moderately more complex in her native language.

Table 3. Complexity of mother's speech

Language	Total number of utterances	Multiclause utterances	One-word utterances	Two-word utterances	MLUw
English	1116	13.35%	20.07%	9.23%	5.02
Slovak	1045	22.11%	17.03%	11.96%	5.46

Speech Fluency

Fluency is commonly viewed as smoothness of communication. It is intuitively associated with general oral proficiency, including effortless processing and automaticity of language use (see Lintunen & Peltonen, 2019). Because English is mother's foreign language, the criterion of fluency was considered essential for the comparative analysis of her CDS in a native vs. a non-native language.

Table 4. Fluency of mother's speech

Language	Total number of utterances	Disfluencies	Multiple intrasentential disfluencies (rate within disfluencies)	Self-repetitions
English	1116	10.93%	35.25%	10.22%
Slovak	1045	8.71%	21.51%	8.42%

The rates of disfluencies and self-repetitions show a slight difference in favour of the native language, although the 2% difference in percentage is relatively marginal. However, a more detailed insight into the rates of disfluencies by means of considering multiple intrasentential disfluencies provides data bearing a more striking difference (almost 14%). It is actually the biggest difference in the overall analysis. It means that although the percentage of general disfluent utterances in the two languages was not remarkably different, their internal details still show a considerable increase of hesitations and false starts in mother's English in comparison to her Slovak. Thus, it can be concluded that mother's speech is moderately more fluent in her native language.

Discussion and Conclusion

The results provided in the study are largely congruent with previous research in this field. The cross-linguistic comparison confirmed CDS as a specific type of simplified register characterized by intensified expressivity, situational character and an increased degree of predictability (Brestovičová, 2018). Moreover, the analysis of the collected data of mother's language samples revealed that as for the four examined aspects – euphemizing lexis, speech density, complexity and fluency, the native language surpassed the non-native language in all of them, albeit not very significantly.

It can thus be summarized and concluded that CDS maintains its distinctive features regardless of speaking a native or a non-native language to the child. Nevertheless, the impact of a native vs. a non-native language on the use of CDS becomes evident in the frequency and variability of some lexical and syntactic structures as well as in the degree of fluency. These findings are in accordance with preceding research that suggested qualitative differences between native and non-native speakers (Shanks, Señor & Hoff, 2015; Shiro, 2016), e.g., syntactically less complex speech of non-native speakers (Altan & Hoff, 2018), greater support of children's language development

from native input (Altan & Hoff, 2018; Hoff, Core & Shanks, 2020; Place & Hoff, 2011), and hybrid communicative practice in bilingual homes (cf. Shiro, 2016).

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The perception of L3 Quebec French (QF) tense and lax vowels contrasts by L1 Mandarin-L2 English learners

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Abstract. The Linguistic Proximity Model (LPM) (Westergaard, Mitrofanova, Mykhaylyk and Rodina, 2017) proposes property-by-property transfer: learners select a property, such as verb raising from one of the previous language sources to analyze L3 input based on comparison between the L1 and L2. However, the investigation of the LPM in L3 phonology remains a neglected area. Inspired by the LPM, using the contrastive hierarchy theory as a representational model, I hypothesize that Mandarin speakers are able to select the [+tense] feature (used to distinguish /i/ from /ɪ/) from L2 English to learn L3 Quebec French (QF) tense and lax vowels. To test this, my study examines the perception of L3 QF tense and lax vowels-both allophonic [y, ʏ] and phonemic contrasts /ɛ, e/-by L1 Mandarin-L2 English learners at the high intermediate level of QF proficiency. An ABX discrimination task (with 1500ms ISI) was conducted by embedding [y, ʏ] and /ɛ, e/ in CVC syllables ([bVb], [dVt], [sVz]) in 60 trials. Eleven native Mandarin speakers and seven native Quebec French speakers were recruited. The Mandarin speakers' English proficiency level was measured by IELTS (average score 7.0). Their QF proficiency level was measured by a self-rated background questionnaire. The results indicate that Mandarin and Quebec French speakers perform similarly on all contrasts (above 94% accuracy), with no significant difference for [y, ʏ] ($R= 0.25$, $p > 0.32$) or for /ɛ, e/ ($R = 0.41$, $p > 0.12$). Mandarin speakers show no significant difference between the two QF contrasts ($R= 0.015$, $p > 0.9$). These findings reveal that L1 Mandarin-L2 English learners are able to parse L3 tense and lax vowel contrasts /e-ɛ/ and [y, ʏ] by selecting a phonological feature [+tense] from L2 English feature hierarchy.

Keywords: L3 phonology; the linguistic proximity model; the contrastive hierarchy theory; Quebec French learners

Introduction

In recent years, formal approaches to third language acquisition have received increased attention, with numerous studies investigating a variety of language phenomena (Rothman, 2011; Cabrelli Amaro, Iverson, Giancaspro, Halloran, 2020; Westergaard, et al 2017; 2021). In L3 acquisition, one of the key questions is whether both of the previously learned languages affect L3A. To address this, Westergaard, Mitrofanova, Mykhaylyk and Rodina (2017) propose the Linguistic Proximity model that crosslinguistic influence1 is conditioned by abstract linguistic structure depending on structural similarity. This model focuses on the selection of the parts of I-language grammars of either or both of the previously acquired languages. When a learner is exposed to L3 input, he or she is able to use the abstract I-language grammar of the previously acquired languages (such as, adverb placement) to parse the incoming signal to build a new L3 grammar. This model

has been widely used to explain language phenomena in L3 acquisition, mostly in morphosyntax and phonetics. However, the investigation of the LPM in L3 phonology remains a neglected area. Inspired by the Linguistic Proximity Model, using contrastive hierarchy theory (Dresher, 2009) as a representational model, my study examines L1 Mandarin L2 English learners acquiring L3 Quebec French vowel contrasts: tense and lax vowels, allophonic contrasts [y, ʏ] and /e, ɛ, /.

Theoretical Background

In this section, we will look at the linguistic proximity model that sheds light on my study and the contrastive hierarchy theory, a representational model proposed by Dresher (2009). A brief description of French vowels will be also given.

The Linguistic Proximity Model (LPM)

The LPM predicts multiple sources for transfer (Westergaard, et al 2017; 2021). The transfer with respect to a particular property is based on structural similarities between the L3 and one (or both) of the previously acquired languages. The transfer takes place only if the learner is able to analyze L3 input by operating the parser on an L3 property based on the closet match in L1 / L2 or UG. To understand how a learner parses L3 input based on a parsing comparison between L1 and L2, let's take a look at one example. Assuming that a learner's first language is head-initial meaning that heads precede their complements (e.g., English), as in (1), and his or her second language is head-final (complements precede heads, e.g., Japanese), as in (2).

(1)

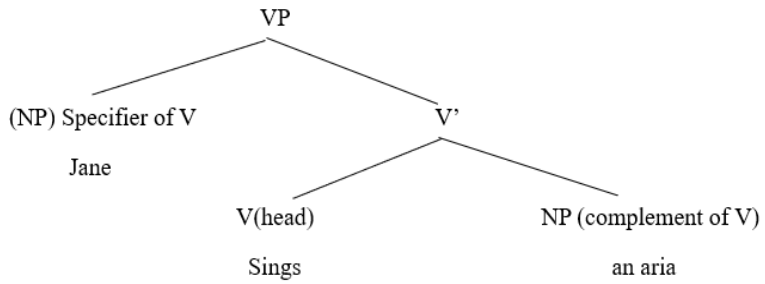

Figure 1. Head initial

(2)

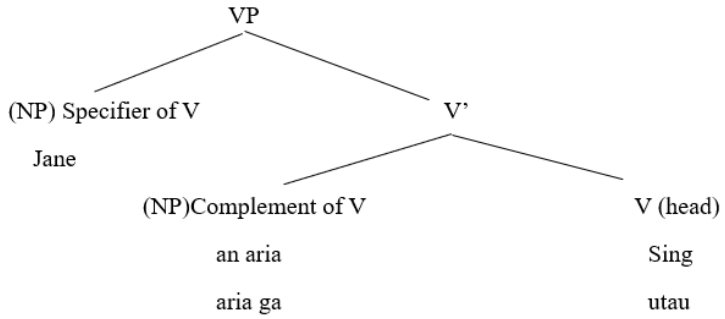

Figure 2. Head final

When someone learning Korean (head-final) as a third language as in (3) hears complements preceding heads, he or she is able to parse the Korean sentence in (3) by the head-final structure he or she acquired in Japanese, and the output of the parse tells the learner that *Mimi* is a noun phrase and the subject of the sentence, *book read* is a verb phrase containing the direct object of a main verb *book* and the main verb *read*, so Korean is categorized as head-final. This transfer is also called facilitative influence according to the LPM, which is the transfer based on structural similarity: Learners analyze L3 input and make predictions about the L3 structure by consulting previously acquired grammars.

(3) Mimi-ka chayk-ul ilk-ess-ta
Mimi-NOM book-ACC read- PAST-DECL
'Mimi read the book'

Bear in mind that properties from both previously acquired languages remain active in a learner's mind and influence L3 acquisition (Westergaard, 2021). What property is actually selected will depend on the parsing comparison. In addition, crosslinguistic representational transfer is about linguistic proximity at an abstract level (Westergaard 2021). To examine facilitative influence in relation to speech sounds, it is essential to understand how to measure linguistic proximity at an abstract level between two languages and what phonological parsing would be. In the next section, a phonological model used to measure linguistic proximity will be introduced.

Contrastive Hierarchy Theory (CHT)

It is commonly believed that *features*, the phonological representation of speech sounds, provide great insight into a language's system of phonemic contrasts (Hall, 2011; Mielke, 2011). Based on feature theory and the notion of contrast, Dresher (2009) proposes a phonological model. This model adopts the theory of contrastive specification. Contrastive specification stipulates that in order to specify a phoneme, we need only designate features used to differentiate segments from other phonemes in a particular language. For instance, in Mandarin, [±round] is the only feature that distinguishes /y/ and /i/ (Duanmu, 2007), and therefore [±round] needs to be specified in Mandarin.

As Dresher (2009) mentions, phoneme inventories are best understood in relation to contrastive feature specifications, assigned in language-specific hierarchies by the Successive Division Algorithm (SDA), a procedure for specifying contrasts and establishing hierarchy. In the SDA, features are assigned to divide the inventory into smaller binary subsets until each phoneme is uniquely specified. The selection of the features is determined by examining the phonological processes in the language (Dresher, 2009). The following is a CHT analysis of the Mandarin vowel system (Wu, 2021). Five underlying phonemes /i/ /y/ /ə/ /a/ /u/ are uniquely specified with contrastive features that are ranked hierarchically. The selection of contrastive features is based on examining the phonological processes of Mandarin. In Mandarin, two front vowels /i, y/ trigger frontness assimilation in the mid vowel (/ə/ becomes [e] before or after /i/ and /y/) (Duanmu, 2007). Therefore, /i, y/ must be specified with [+front] in order to trigger the process.

(4) Mandarin vowel feature hierarchy (Wu, 2021)

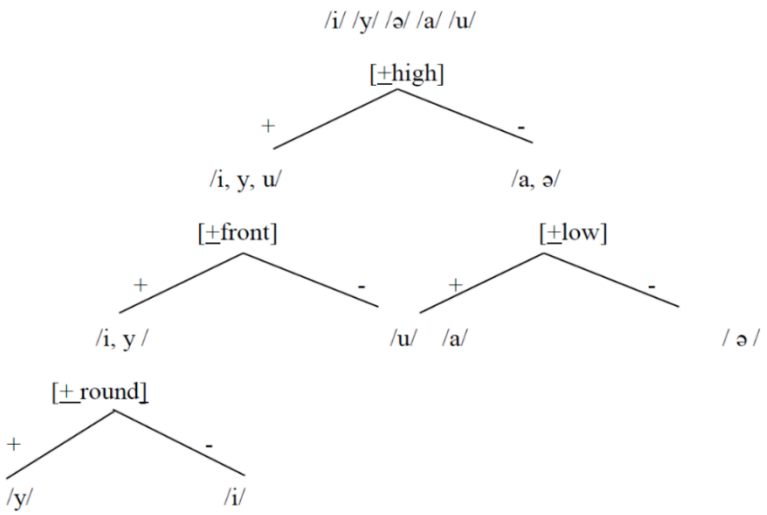

Figure 3. Mandarin vowel feature hierarchy

It is important to note that the contrastive hierarchy predicts that we should see inventory effects when it comes to segmental behaviour (Archibald, 2022). The feature that divides the phonemic inventory determines the segmental behaviour. For example, as in (4), [± high] divides five vowels into /i, y, u/ and /ə, a/. We might, thus, expect that all the [+high] vowels behave differently from [-high] vowels. In relation to my study, it is expected to find that the L3 vowel contrasts marked by [-tense] or [+tense] should behave similarly.

Quebec French Tense and Lax Vowels

The Quebec French vowel system includes three underlying high vowels /i, y, u/ and laxing allophonic contrasts [ɪ ʏ ʊ]. There is a contextual variation between tense vowels /i y u/ and lax vowels [ɪ ʏ ʊ] (Hall, 2016). Laxing vowels occur in final closed syllables, as in (5). Also, laxing allophones of a high vowel in a final closed syllable trigger regressive harmonic laxing of high vowels in previous syllables, as in (5a).

(5) Laxing harmony (Poliquin, 2006)

a. minute [mɪnʏt]

b. pourrite [pʊbɪt]

c. stupide [stsʏpɪd]

A rule of closed-syllable laxing can change [+high] vowels from [+tense] to [-tense], which suggests that [±tense] is phonologically active on high vowels. In Quebec French, [±tense] is also used to distinguish phonemic mid vowels contrasts /e, ɛ/, such as *maître* [metr] ‘master’ and *mettre* [mɛtr] ‘to put’. As in (6), [±tense] is specified on high vowels in Quebec French vowel feature hierarchy although we cannot see laxing allophones of high vowels in this hierarchy since only phonemes are shown in the feature hierarchy.

(6) Quebec French vowel feature hierarchy

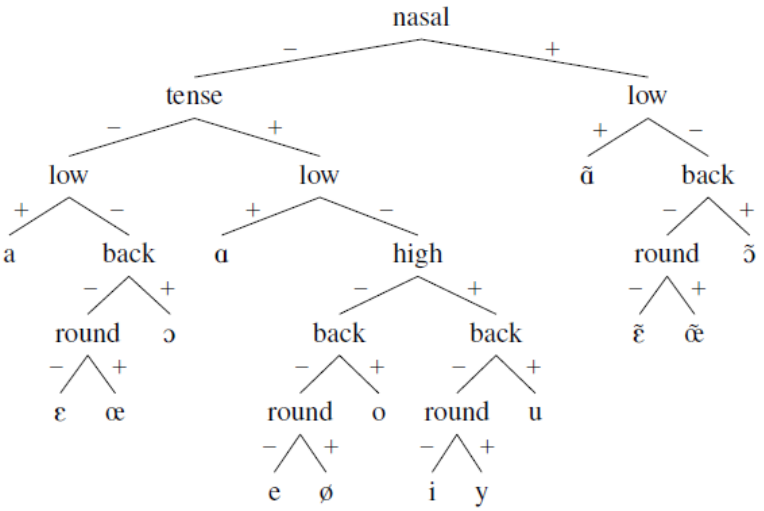

Figure 4. Quebec French feature hierarchy

My Study

As shown previously, Quebec French tense and lax vowels [y, ʏ] and /ɛ, e/ are marked by the feature [±tense]. English also has [± tense] to differentiate tense and lax vowels, such as /i, ɪ/ (Flynn, 2012), but Mandarin does not have [±tense] (Duanmu, 2007), as in (7).

(7) Mandarin, English, Quebec French vowel feature hierarchies:

a.

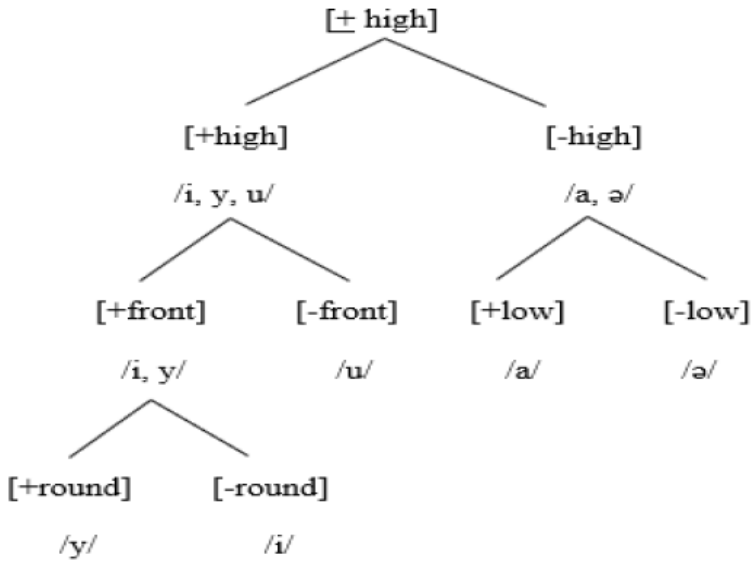

Figure 5. Mandarin vowel feature hierarchy (Wu, 2021)

b.

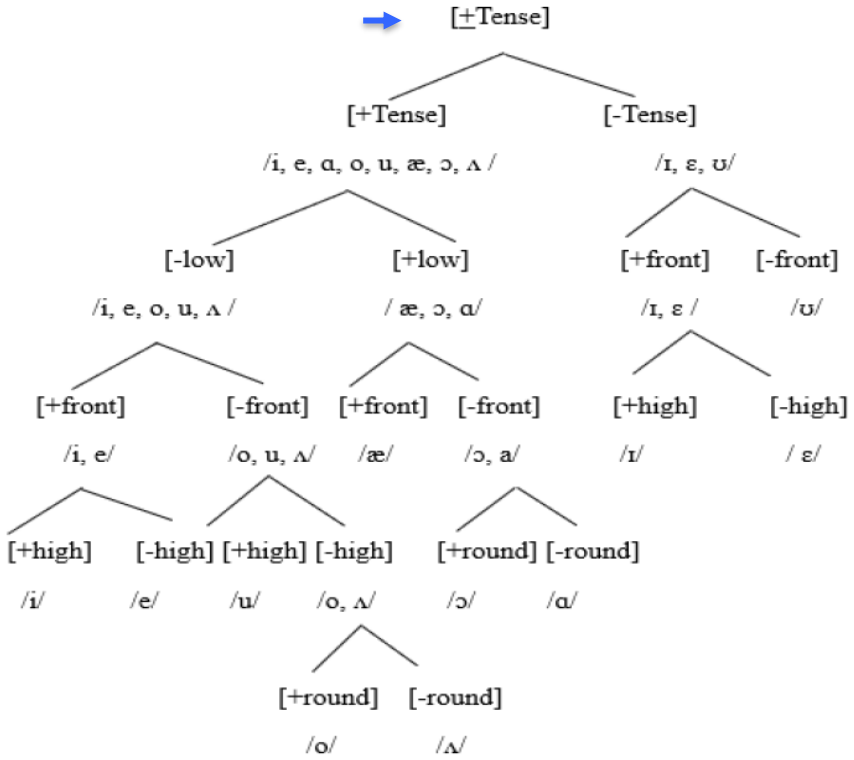

Figure 6. English vowel feature hierarchy (Kwon, 2021)

c.

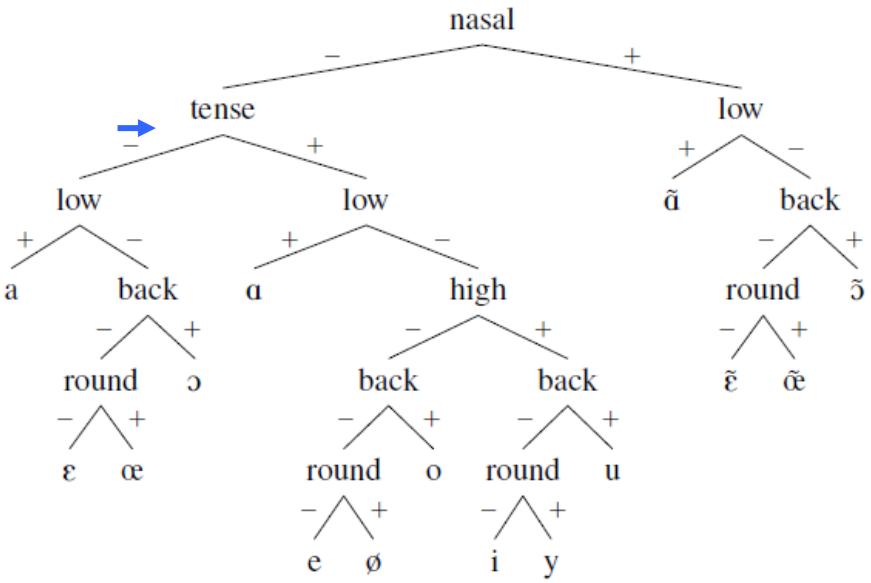

Figure 7. Quebec French vowel feature hierarchy (Hall, 2006)

Inspired by the LPM, I hypothesize that with the help of [+tense] feature from L2, L1 Mandarin-L2-English learners will demonstrate accurate perception when perceiving the L3 phonemic contrasts /ɛ, e/. For the allophonic contrasts, tense and lax vowels such as /e-ɛ/ are unpredictable

because they are phonemic, but [y, ʏ] are predictable because they are allophonic. So, there might be differences between the perception of allophonic and phonemic contrasts. However, according to Walker (1984), [+tense] on high vowels in Quebec French is contrastive because it triggers phonological processes. I hypothesize that L1 Mandarin-L2-English learners should achieve accurate perception of both phonemic and allophonic contrasts.

The following are my research questions:

1) Do L1 Mandarin-L2-English learners receive facilitative influence from L2 English ([+tense]) in the perception of allophonic contrasts [y, ʏ] and phonemic contrasts /ɛ, e / in L3 Quebec French?

2) What are the differences between the perception of allophonic and phonemic contrasts?

Method

To test my hypothesis, an ABX discrimination task was conducted by embedding [y, ʏ] and /ɛ, e/ in CVC syllables ([bVb], [dVt], [sVz]) with unrelated distractors (/i/-/u/). Pseudo words were used because given the properties of allophony, the environmental context cannot happen in real French words. The reason to select those consonantal contexts is because French vowels spoken in those consonantal contexts are identified significantly better than isolated vowels (Gottfried, 1984; Feijóo & Balsa, 1998).

Stimuli were arranged in four different pairings for [y] and [ʏ] and /ɛ, e /: BAA, ABB, ABA, and BAB. This yields a total of 48 trials (one trial being a sequence of three non-words). Distracter contrasts including the vowels /i/-/u/ were added randomly into those trials. In total, I had 60 trials. Stimuli was recorded by one native (Quebec French) French speaker in a sound-isolated recording booth. The speaker read the target word three times. Recordings were normalized for amplitude and spliced into separate sound files using Praat. The inter-stimulus interval (ISI) was 1500ms, which should elicit a phonemic level of perception based on Werker & Logan (1985)' s experiments. I chose a 1500ms ISI because I aim to examine the use of [+tense] as a contrastive feature in L3. Participants had 2000 ms to make their response before the next trial was initiated. All items were automatically randomized by the program PsychoPy for presentation to participants. Then, the program was stored on the website Pavlovia, a platform for online experiments.

Eleven native Mandarin speakers (3 males and 8 females) and seven native Quebec French speakers (2 males and 5 females) were recruited. Mandarin speakers are high school or college students in Canada. The Mandarin speakers' English proficiency level was measured by IELTS (average score 7.0) or TOEFL. Their QF proficiency level was measured by a self-rated background questionnaire. They are at intermediate and advanced levels on the ACTFL scale based on instructional hours. LOR means their length of residence in Canada. AO means their average age of onset for English / French, as in Table 1.

The Mann-Whitney U test was used to determine whether there are any statistically significant differences between Quebec French speakers' and Chinese speakers' perception of /e-ɛ/ and [y, ʏ] contrasts. The Wilcoxon test was used to examine whether there are statistically significant differences between Chinese speakers' perception of /e-ɛ/ and [y, ʏ] contrasts.

Table 1. Learners' information

No.	Gender	Age	LOR	Origen	Education	AO (E)	AO (F)	IELTS	Quebec French (self-rate)
P1	M	21	3 yrs	Suzhou	Undergraduate (McGill)	13 years	1 year (about 150-200 hours)	6.5	Intermediate
P2	F	21	3 yrs	Shandong	Undergraduate (Toronto)	10 years	1 year (about 120 hours)	7.0	Intermediate
P3	F	17	5 yrs	Tianjin	High school (Mount D)	7 years	5 years	7.0	Advanced
P4	F	18	6 yrs	Beijing	High school (Oak Bay)	10 years	4 years	7.5	Advanced
P5	F	18	5 yrs	Beijing	High school (Mount D)	6 years	3.5 years	7.0	Advanced
P6	F	20	4 yrs	Fujian	Undergraduate (Toronto)	13 years	5 years	7.5	Advanced
P7	F	21	6 yrs	Beijing	Undergraduate (Toronto)	15 years	5 years	8.0	Advanced
P8	F	21	6 yrs	Changzhou	Undergraduate (McGill)	10 years	1.5 year	6.5	Intermediate
P9	F	21	3 yrs	Beijing	Undergraduate (McGill)	17 years	1.5 year	TOEFL (110/120)	Intermediate
P10	M	20	2 yrs	Xinjiang	Undergraduate (Toronto)	12 years	2 years	7.0	Intermediate
P11	M	21	3 yrs	Suzhou	Undergraduate (McGill)	13 years	1 years (about 120-150 hours)	7.5	Intermediate

Results

The total accuracy rates of the ABX discrimination task (mean) are displayed in Figure 8. In general, the results reveal that the L1 Mandarin L2 English learners and the native Quebec French speakers perform similarly to each other on all contrasts. On the phonemic contrast /e-ɛ/, both groups perform above 95% accuracy: Mandarin speakers 95.5% versus QF speakers 98.8%. On the allophonic contrast [y, ʏ], both groups perform above 94% accuracy: Mandarin speakers 94.3% versus QF speakers 97.0%. Both groups perform more accurately on the /e-ɛ/ than on the [y, ʏ] contrast.

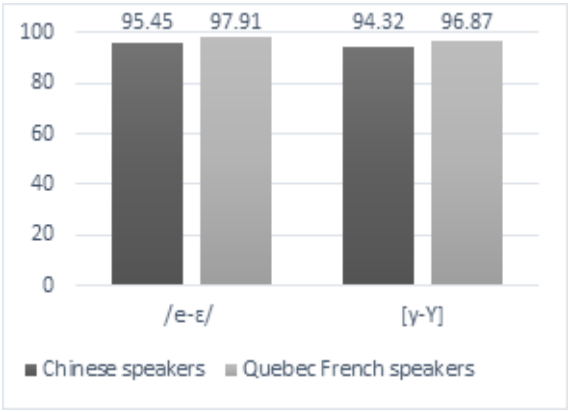

Figure 8. Chinese speakers and Quebec French speakers' perception

Furthermore, the Mann-Whitney test shows there is no significant difference between the learner group and the Quebec French natives on the two contrasts, as shown in Table 2. This suggests that with the help of L2 English specifically [+tense], L1 Mandarin-L2 English learners can clearly acquire the L3 contrasts as native speakers of Quebec French.

Table 2. Accuracy rate in each group

	Accuracy rate (mean%)	***p*-value ($p < 0.05$)**
Chinese speakers' perception of [y, ʏ]	94.32	R = 0.25, p > 0.32
Quebec speakers' perception of [y, ʏ]	96.87	
Chinese speakers' perception of /e-ɛ/	95.45	R = 0.41, p > 0.12
Quebec speakers' perception of /e-ɛ/	97.91	

Mandarin speakers' perceptions of the two contrasts are also similar, as given in Figure 9, with no significant difference between the perception of the two contrasts, as in shown in Table 3. This indicates that L1 Mandarin L2 English learners perceive the allophonic contrasts [y, ʏ] and the phonemic contrasts /e-ɛ/ similarly, which confirms that [+tense] is contrastive on high vowels in Quebec French (Walker, 1984).

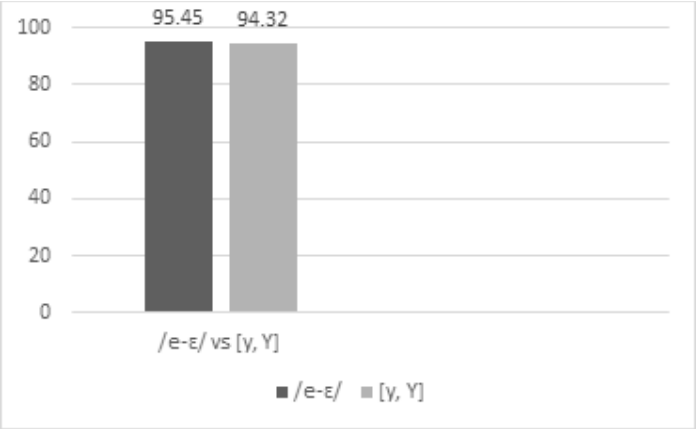

Figure 9. Chinese speakers' perception of the two contrasts

Table 3. Accuracy rate in the learner group

	Accuracy rate (mean%)	*p*-value ($p < 0.05$)
Chinese speakers' perception of [y, ʏ]	94.32	$p > 0.9$, R=0.015
Chinese speakers' perception of /e-ɛ/	95.45	

It is important to notice that there are no strong variations among participants. The following table is the accuracy rate each participant achieved across consonantal contexts.

Table 4. Accuracy rate (as percentages) by each participant

	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
/y/-/Y/											
/bVb/	100	100	75	100	100	100	100	100	87.5	87.5	75
/dVt/	100	100	87.5	87.5	100	87.5	100	100	100	100	100
/sVz/	100	87.5	87.5	87.5	100	100	100	87.5	87.5	100	87.5
Total	100	95.8	83.3	91.67	100	95.8	100	95.8	91.67	95.83	87.5
/ɛ /-/e/											
/bVb/	100	100	100	75	100	100	100	100	75	75	87.5
/dVt/	100	100	100	100	100	100	87.5	100	100	100	100
/sVz/	100	62.5	87.5	100	100	100	100	100	100	100	100
Total	100	87.5	95.83	91.67	100	100	95.83	100	91.67	91.67	95.83

As can be seen in Table 4, in general, most participants achieve almost celling performance as the Quebec French natives with 100% accuracy rate, while there is only one participant who perceives worse, with 62.5% accuracy rate in /sVz/. Also, it seems likely that the vowel pairs in /sVz/ and /bVb/ are challenging for some participants. Most Mandarin speakers are able to perceive the two vowel contrasts accurately as the Quebec French natives. Only few learners behave differently, with more errors in some contexts compared with all the other participants.

To summarize this section, the results indicate that Mandarin and Quebec French speakers perform similarly on both contrasts. My findings suggest that learners are able to select a phonological feature [+tense] from previous L2 English feature hierarchy to represent L3 tense and lax contrasts /e-ɛ/ and [y, ʏ]. Further, it is noticeable that there are inventory effects when it comes to segmental behaviour: the contrasts marked by [+tense] do behave similarly: the two contrasts /e-ɛ/ and [y, ʏ] marked by [+tense] are both clearly acquired by L1 Mandarin L2 English learners.

Discussion and Conclusion

It is interesting to note that L1 Mandarin-L2 English learners are able to achieve accurate perception of the two contrasts marked by [+tense] because [+tense] is absent in their L1, which means that Mandarin speakers should experience difficulties acquiring tense and lax contrasts (Bohn, 1995; Zhang, 2002). As Brown (1998) proposes, the lack of the feature in a L1 is the main source of errors in the perception of a target sound. However, with the help of L2 English feature hierarchy, Mandarin speakers show the same ceiling performance on the two contrasts as the Quebec French natives.

In the future, it would be interesting to investigate whether learners are able to select both features from both L1 and L2 to parse L3 input. For example, Quebec French has a front rounded vowel /y/ ([+front, + round] see section 3). Mandarin also has /y/ ([+front, +round] see section 3), but English does not. With my results, I hypothesize that Mandarin speakers actually select [+front, +round] from the L1 and [+tense] from L2 English to parse [y, ʏ] in Quebec French. To examine this, L1 English-L2 Quebec French learners are needed as a comparison group. In fact, Nichols (2014) has revealed that L1 English-L2 Quebec French learners did perceive inaccurately in the perception of [y, ʏ] in Quebec French with only 66.2% accuracy rate, but in my study, with the help of L1 Mandarin feature, participants achieved above 94% accuracy rate. In addition, there are also limitations of this study, such as the number of participants.

To sum up, the current study explores the role L2 plays in acquiring L3 target sounds, using the contrastive hierarchy theory as a representational model, with the conclusion that L1 Mandarin-L2 English learners are able to parse L3 tense and lax vowel contrasts /e-ɛ/ and [y, ʏ] by selecting a phonological feature [+tense] from L2 English.

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Pronunciation teaching for adult L2 learners

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Abstract. Pronunciation teaching was in focus for a one-year school project in which teachers in the program Swedish for immigrants (SFI) and one researcher participated. SFI is an education program at different levels in Swedish for adult immigrants with different mother tongue, education, and school background, from no schooling to highly educated. The teachers expressed they needed more knowledge about how to teach Swedish pronunciation, especially for those who have studied the language for a while without any clear progression, students with a fossilized pronunciation. The students' knowledge in grammar and vocabulary has reached a more advanced level than pronunciation. The aim of this collaborative project was to increase the teachers' knowledge and awareness of pronunciation teaching, to discuss didactic methods for implementation in classrooms at different levels. This was also an opportunity for the researcher to discuss theoretical aspects of pronunciation and how to implement research results in the Swedish language learning classroom for adults. Field notes from classroom observations, discussions and personal interviews constitutes the material for this presentation. We had discussions, interviews and meetings at the school or by using the digital platform Zoom. At the end of the project time, teachers report they are more motivated and self-esteemed in their teaching of Swedish pronunciation. Their teaching is more explicit, sometimes including individual training, using didactic methods with the intention of focusing on prominent features important for learner with different language backgrounds to achieve an intelligible pronunciation. One conclusion of the project is that more knowledge and implementation of didactic training about pronunciation teaching is of importance for active and future teachers in Swedish as a second language for adult learners.

Keywords: pronunciation teaching; Swedish phonology; adult L2 learners; didactics

Introduction

Swedish for immigrants (SFI) is an education program at different levels in Swedish for adult immigrants with different mother tongue, education, and school background (Swedish National Agency for Education). There are different levels for learners from no schooling to high educated. The education is free of charge for immigrants who have received residency in Sweden, and the teaching usually takes place 15 hours a week. Adult learners are welcome from the age of 16 years. Younger immigrants study Swedish as a second language in the ordinary school system. The aim of the education program is to give adult immigrants basic knowledge of the Swedish language and an introduction to Swedish society. Immigrants without basic reading and writing skills or with knowledge of another alphabet than the Latin script, will get the opportunity to acquire such knowledge in Swedish. There are five overall goals in the syllabus for the education that will be assessed and examined before the student can move to the next level in the education system or

finish their education. The goals are: listening, writing and reading comprehension, oral interaction and oral production. It is of importance that immigrants learn the Swedish language to a sufficient degree for integration in the society, opportunity to get a job and for higher education. The teaching of pronunciation is therefore of great importance in second language education.

Teachers at one SFI education program asked for more knowledge about pronunciation teaching and didactic methods. The teachers wanted to develop their teaching for adult second language (L2) learners of Swedish with different language backgrounds. Therefore, a collaborative project between the teachers and one researcher was organized by the University for one year. This is a part of a national program initiated by the government, a kind of practical school research.

Aim and Research Question

The aim of the project was that teachers should gain increased knowledge about pronunciation teaching and explore new didactic methods for development of their pronunciation teaching for adult L2 learners of Swedish. The research questions are:

1) What do teachers need to develop their pronunciation teaching helping L2 learners of Swedish to achieve an intelligible pronunciation?
2) What kind of didactic methods can be implemented in their teaching?

Pronunciation Teaching

Adult second language learners generally speak new languages with a foreign accent, it is often unavoidable (Flege et al., 1995; Moyer, 2013). The accent form identity markers that occur at all language levels, such as grammar, vocabulary as well as pronunciation. The goal for pronunciation teaching should be that learners achieve an intelligible pronunciation, not necessary native-like (Levis, 2005, 2020), although that might be the goal for some learners. Studies have shown that explicit pronunciation teaching is useful and help learners to achieve an intelligible pronunciation, even learners with a fossilized speech (Derwing & Munro, 2015; Dlaska & Krekeler, 2013; Gordon & Darcy, 2016; Grant, 2014; Levis, 2018; Thomson & Derwing, 2015).

Except knowledge about pronunciation teaching pedagogy, teachers need to have theoretical linguistic knowledge, especially in phonetics and phonology. Pronunciation teachers also need to know what features to focus on for an intelligible pronunciation in the target language. However, studies focusing on teachers' knowledge, education and teaching of pronunciation show that teachers do not feel confident and ask for teacher training and explicit didactic methods in this area (e.g. Breitkreutz et al., 2001; Huhtamäki & Zetterholm, 2018; Macdonald, 2002; Baker, 2011; Foote et al., 2011; Henderson et al., 2012; Couper, 2017; Zetterholm, 2018). Teachers often prioritize other linguistic features in their teaching, such as grammar or vocabulary to help students completing their courses. Classroom observations in the teaching of English (Foote et al., 2016) and of Swedish (Huhtamäki & Zetterholm, 2018) as second languages show that teachers in general are not focusing on pronunciation teaching but that it happens in a more ad hoc fashion in the classroom. One conclusion related to results from different studies is that there is a need for more teaching and education about phonetics, phonology, and didactics in teacher education programs.

Swedish Phonology and Pronunciation

Below is a short description of Swedish phonology and prosody of what is important in Swedish phonology for an intelligible pronunciation. Examples are taken from research about what is often difficult for L2 learners of Swedish pronunciation.

The Swedish language has nine long vowel phonemes with short counterparts. There are three rounded fronted vowels, /y/, /ø/ and /ʉ/, with different lip gestures, outrounded and inrounded. These vowels are quite uncommon among languages in the world (Ladefoged & Maddieson, 1996). The rounded vowels and the differences in rounding are often a challenge for L2 learners (Bannert, 1990; Zetterholm & Tronnier, 2019). If vowels are replaced, the word might be misunderstood, e.g., the word tyg /tyːg/ (fabric) might be pronounced with an unrounded vowel as in tig /tiːg/ (be silent), the word svår /svoːr/ (difficult) pronounced as svar /svɑːr/ (answer) and lön /løːn/ (salary/reward) pronounced with a different lip rounding, as in lån /loːn/ (loan). The vowel /ʉ/ in hus /hʉːs/ (house) is often pronounced with an /uː/ as in the word hos /huːs/ (at, e.g. be at somebody's house).

There are 18 consonants in the Swedish consonant system, all with a qualitative contrast. Except for the two fricatives /h/ and /ɕ/, all consonants occur in short and long variants. Swedish has both unvoiced and voiced plosives and fricatives, such as /p, b/ and /f, v/. The distinction between buss /bɵsː/ (bus) and puss /pʰɵsː/ (kiss) is confusing for some L2 learners, especially with Arabic or Somali as their L1. The Swedish phonotactic system allows three initial consonants if the first is an /s/, the second an unvoiced plosive /p/, /t/ or /k/ and the third consonant /l/, /j/, /r/ or /v/. This is found in words like splittra /splɪtːra/ (divide), spjut /spjʉːt/ (spear), strand /stranːd/ (beach) and skvaller /skvalːɛr/ (gossip). The consonant clusters are especially difficult for L2 learners with no clusters in their first language. To make the pronunciation easier, inserting of an extra vowel, epenthesis, as in the word flesta /fləsta/ (most) pronounced as /fələsəta/ is common. Elimination of final consonants is also found in a study with Sgaw Karen L1 speakers (Zetterholm, 2014), e.g. tåg /tʰoːg/ (train) is pronounced tå /tʰoː/ (toe), bok /buːkʰ/ (book) is pronounced bo /buː/ (nest). The use of epenthesis as well as reduction or elimination is confusing for a Swedish listener and too many pronunciation errors might affect the comprehensibility and the listener's cognitive processing (Derwing & Munro, 2015; Levis, 2018).

Swedish is a stress-timed language and the quantity system with a complementary distinction in stressed syllables is a salient feature in Swedish. The vowel or the consonant in a stressed syllable must be long, V:C or VC:, but not both of them. The long consonant if often spelled with double letters and that might be a clue for pronunciation. e.g. mata /mɑːta/ (feed) and matta /matːa/ (carpet). As seen in this example, the a-vowel is pronounced with different quantity and quality in the two words. The distinctive quantity contrast is often confusing for L2 learners, especially in the pronunciation of minimal pairs like vägen /vɛːgən/ (the road) and väggen /vɛgːən/ (the wall) and stress placement in banan /bɑːnan/ (the path) and banan /banɑːn/ (banana) (Bannert, 1990; Zetterholm & Tronnier, 2019).

Method

The material contains field notes from classroom observations, interviews, and discussions between teachers and researcher as well as recordings of some focus students. Interviews and discussions have been made both at the school, and via the digital platform Zoom. Students have been recorded at the school, using an Ipad or a digital Sony voice recorder (results will not be presented in this paper). In between meetings, the teachers have tested and tried out different

pronunciation didactic methods in their classrooms. Some of them made their own teaching materials, words, and pictures, suitable for their teaching at different lessons.

Results

Some classroom observations are planned visits to find out how they teach Swedish pronunciation, others not. The observations show that pronunciation is often taught in connection to exercises of spelling and writing and the relation between phoneme and grapheme is explained. When teaching vocabulary, words in the textbook are translated and explained, and students are often asked to write down the words. Some teachers also have specific pronunciation training concerning vowels, consonants, and quantity distinctions including imitation and repetition of the pronunciation. The Swedish prosody, such as stressed/unstressed syllables are not in focus that often, nor explicit listening comprehension tests. It is obvious that learners need individual feedback and that is quite time consuming for teachers. At lower education levels it is not easy for learners to work and exercise in pairs because of their limited knowledge of Swedish, the common language in the classroom. One of the teachers at the higher education level said that repetitions are of importance. Observations of pronunciation lessons show that she focuses on the distinction between long and short vowels and consonants. She uses pictures of the mouth and lips when explaining articulation, and different common words such as båt /boːt/ (boat) and åtta /ɔtːa/ (eight) for practice separately (with pictures) and embedded in sentences. She also points out the relation between pronunciation and orthography, e.g. the long and short phoneme /o/ can be spelled with an <o>, sova /soːva/ (sleep) boll /bɔlː/ (ball) or an <å>, see examples above. Students practice in pair, preferably with someone speaking another L1. She often works with the same material and exercises for one week or more.

We have discussed what kind of pronunciation material would be useful for students who, mentioned by teachers, have problems with the distinction between /r/ and /l/ and the articulation of Swedish vowels, especially students with Thai as their L1. Students with Somali or Arabic as their L1 have specific problems with pronunciation and articulation differences between unvoiced and voiced plosives /p, b/ and fricatives /f, v/ as well as the rounded vowels. Explicit and individual training is one method implemented in some classes. Learners' perception of Swedish pronunciation and the use of perception tests were discussed. When teachers and learners discuss and compare pronunciation and articulation in languages represented by students in the classroom, all students' metalinguistic awareness and understanding of difficulties for learners with different language backgrounds increase. Therefore, teachers were encouraged to do so. At the end of the project, all teachers mentioned that they are more motivated and aware of how and what to teach for an intelligible pronunciation and their teaching is now more explicit. Having a better understanding of the relation between learners' language backgrounds and Swedish make it easier to give students explicit and individual exercises and feedback. The teachers also reflect on some of the learners' progression during this year of training. This will be further analyzed in the recordings of learners during the project.

Conclusion

During the project there has been many fruitful discussions about pronunciation teaching, what teachers found hard to teach as well as what they think is hard for L2 learners of Swedish to achieve

an intelligible pronunciation. Their comments are in accordance with earlier research, classroom observations, interviews, and questionnaire studies (Huhtamäki & Zetterholm, 2018; Zetterholm, 2018). National and international research have been presented and discussed with a specific focus of what is possible for implementation in the SFI classrooms at different levels where students have different language and school backgrounds, some with a fossilized Swedish pronunciation. All participating teachers have a teacher education at university level including phonetics and phonology. However, they do not have that many experiences of pronunciation didactic methods or practice during their education, and textbooks for L2 learners do not include that much about pronunciation teaching, ideas, or exercises. That means that teachers often make their own teaching material, which is the case especially for one of the participating teachers.

In discussions it is clear, that knowledge and awareness about pronunciation teaching and learning strengthens teachers' motivation and self-esteem in the SFI classroom. They now teach pronunciation more explicit using clear examples both concerning articulation, segments, and prosody. They have noticed that explicit pronunciation teaching, both segmental and suprasegmental, is useful, as shown in earlier research (Derwing & Munro, 2015; Dlaska & Krekeler, 2013; Gordon & Darcy, 2016; Grant, 2014; Levis, 2018; Thomson & Derwing, 2015). Following the goals of language education at SFI, the learners should have achieved both reading, writing and oral comprehensions to reach a higher level or finish the program. If one of the linguistic parts, e.g. pronunciation teaching, seems to be more difficult or time consuming than others, teachers might focus on other parts, as shown in earlier research (Foote et al., 2016; Huhtamäki & Zetterholm, 2018). Therefore, a better understanding of how and what to teach as well as implementation of didactics in teacher education and training programs might help active and future teachers in their teaching of adult second language learners of Swedish.

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