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DEVELOPMENTAL DELAYS AND PHONOLOGICAL TRANSFER IN CHILDHOOD BILINGUALISM: A CASE STUDY OF RUSSIAN-ARABIC BILINGUAL CHILDREN

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ABSTRACT

This longitudinal study aimed at investigating the developmental milestones of Russian - Arabic bilingual children while acquiring their second language. The study employed a qualitative research approach through regular parental interview sessions and 3 years of intensive observation. Six Russian-Arabic bilingual children participated in this study aged 2 to 7 years, they are all from Russian mothers and Arab fathers. The results indicate some developmental delays in bilingual participants, such as vocabulary development, response latencies, retrieval pauses, participants use gestures to identify simple words, spending more time to express their ideas, and failing to produce certain consonants in Arabic.

KEYWORDS: Bilingual Children, Developmental Milestones, Russian\Arabic Bilingualism.

1. INTRODUCTION

First language acquisition refers to the natural process through which children acquire their mother tongue from birth, without formal instruction, through exposure and interaction in their environment (George Yule, 2020). For several years, child language acquisition has fascinated researchers. Historical interest in the study of child language can be traced back to ancient civilizations, with irregular accounts emerging from as early as the times of the Greeks and Egyptians. Among the earliest documented observations is the work of Aristotle, who, according to Richter (1927), provided one of the first recorded reflections on how children acquire language. In addition, a fascinating early psycholinguistic experiment is attributed to Herodotus around 600 BC. This experiment, which has been discussed by scholars such as Dale (1972) and briefly recounted by Ferguson and Slobin (1973), involved observing children who were isolated from spoken language to see what language they would naturally produce, shedding light on innate aspects of language development. These early inquiries highlight the long-standing curiosity about the mechanisms of language acquisition, which has continued to develop into a rich field of scientific study today.

Recently, the study of child language development has increasingly attracted the attention of researchers across various disciplines. Scholars such as Ferguson, Slobin, and Crystal (1998) have highlighted how children acquire linguistic and communicative competence in different languages, cultures, and environments. One of particular interest is the development of bilingual children, those children who grow up learning two languages either simultaneously or sequentially. Researchers such as Cummins (1981), Baker (2001), and Bialystok (2007) have examined how bilingualism affects children's cognitive and linguistic development. Despite the extensive literature on bilingual language development, little research has addressed the unique experiences of Russian-Arabic bilinguals in Arab contexts. This study contributes to that gap by investigating the speech and expressive competence of bilingual children from mixed families in Jordan.

This study focuses on a subset of bilingual children: those who speak both Russian and Arabic in Jordan. It seeks to examine their developmental milestones, particularly in early speech production, while bilingualism is often associated with cognitive and communicative advantages, research has also noted potential challenges, including delayed first language (L1) milestones (Paradis et al., 2011),

phonological interference (Grosjean, 2008), and code-switching behavior (Poplack, 1980).

Hence, this research aimed to answer the following questions:

1. How do parents perceive the language development of bilingual children compared to monolingual children, particularly in terms of expressive abilities?
2. What are the major observed developmental milestones in both Russian and Arabic languages experienced by the participants?

2. BILINGUAL CHILDREN AND SPEECH DELAY

Research on bilingual language development consistently demonstrates that bilingualism in itself does not constitute a risk factor for language disorder, although bilingual children, like their monolingual peers, may present with genuine speech or language impairments. As noted by Genesee and Nicoladis (1997), a bilingual child may indeed exhibit a speech or language difficulty that requires clinical intervention. Crucially, however, the identification of such difficulties must rest on a careful differentiation between typical bilingual developmental patterns and true pathological impairment. This distinction is particularly important because cross-linguistic interaction is a normal feature of bilingual development. Therefore, assessment should be conducted by trained speech-language pathologists who possess expertise in bilingual acquisition in order to avoid misdiagnosis.

From a developmental perspective, early bilingual phonological development may initially show limited differentiation between the two linguistic systems. Deuchar and Clark (1996) argue that, at the earliest stages, bilingual children may not fully separate their languages at the phonological level. Such patterns, however, should not be interpreted as confusion or deficit, but rather as a transitional phase reflecting the dynamic organization of dual linguistic input. Over time, bilingual children establish increasingly distinct phonological representations for each language as exposure and cognitive maturation progress.

Importantly, empirical research does not support the assumption that bilingual exposure exacerbates language delay in children with pre-existing impairments. Studies by Gutiérrez-Clellen et al. (2008) and Paradis et al. (2003) provide no evidence that bilingualism results in additional speech or language delays among children diagnosed with language impairment. These findings challenge deficit-oriented views of bilingualism and

underscore the necessity of distinguishing between language difference and language disorder in both clinical and educational contexts.

With respect to speech perception, foundational work by Werker and Tees (1984) and subsequent research by Werker and Byers-Heinlein (2008) demonstrate that typically developing infants display remarkable sensitivity to phonetic contrasts across languages during the first year of life. This heightened perceptual flexibility gradually narrows as infants specialize in the phonological categories of the languages to which they are exposed. Such findings have often been interpreted within a critical-period framework, suggesting that the first year of life represents a window of enhanced speech discrimination capacity. For bilingual infants, continued exposure to multiple phonological systems may sustain sensitivity to contrasts relevant in both languages for a longer duration than in monolingual development.

In the domain of lexical development, bilingual children's vocabulary distribution must be interpreted cautiously. Doyle et al. (1978) report that, at approximately four years of age, bilingual children may produce, on average, roughly half of their vocabulary in each language compared to monolingual peers in a single language. However, when total conceptual vocabulary across both languages is considered, bilingual children's overall lexical knowledge often approximates that of monolingual children. Thus, apparent differences in

single-language vocabulary size do not necessarily indicate delay, but rather reflect the distributed nature of bilingual lexical representation.

3. METHODOLOGY

This study employed a longitudinal observational design to examine the developmental milestones in language acquisition among bilingual children exposed to Russian and Arabic languages. The aim was to document and analyze the children's linguistic progression over an extended period, with particular attention to expressive and receptive abilities, vocabulary growth, and cross-linguistic influences. Interviews were conducted with the parents of participating children to gain insights into their perceptions of their children's developmental milestones in both Arabic and Russian. These interviews focused particularly on identifying any observed delays in language acquisition and use in either language during early childhood. All interviews were audio-recorded, translated, transcribed, and subjected to thematic analysis.

To further assess phonological awareness, the participants were asked to read a set of words containing phonemes that exist in Arabic but are absent in Russian. This component was designed to investigate potential negative transfer effects from the children's first languages to their acquisition of English. The selected word list is presented in Table 1.

Table 1

Arabic word	IPA	Target sound	Place of articulation	Manner of articulation
حياة	/hajāt/	/h/	Pharyngeal	Voiceless fricative
عين	/ʕ ajn/	/ʕ /	Pharyngeal	Voiced fricative (often approximant-like)
صبر	/ʂ abr/	/ʂ /	Alveolar (pharyngealized)	Voiceless fricative
طريق	/t̤ ariq/	/t̤ /	Alveolar (pharyngealized)	Voiceless stop
طريق	/t̤ ariq/	/q/	Uvular	Voiceless stop
ثوب	/θawb/	/θ/	Interdental (dental)	Voiceless fricative

4. THE PARTICIPANTS

The participants in this study were six Russian-Arabic bilingual children, all of whom were growing up in households where both Russian and Arabic were actively used. The children were between the ages of early childhood and primary school entry, a period recognized as critical for phonological development in bilingual contexts (De Houwer, 2009). All six participants had one Russian-speaking parent, while Arabic was maintained through the other parent, extended family members, or the broader community context. In addition to the

children, their immediate families and primary caregivers, including parents and grandparents, were involved in the study to provide supplementary perspectives on the children's language use and development.

The children were selected on the basis of regular exposure to both languages in the home environment, with Russian often functioning as the dominant language due to maternal input, and Arabic serving as either a heritage or community language. Caregivers reported varying degrees of proficiency in both languages, which influenced the

amount and quality of input available to the children. Previous research emphasizes the importance of family language practices and caregiver input in shaping bilingual phonological acquisition, particularly in cases where one of the languages contains marked phonemes absent from the other

(Paradis, 2011; Lanza, 2004). By incorporating both the children and their caregivers, the study aimed to capture not only the children's phonological performance but also the familial and sociolinguistic context in which their bilingual development unfolds.

Table 2

Participant	Age	Languages at Home	Caregivers Involved
Child 1	3 years	Russian, Arabic	Parents, Grandparents
Child 2	5 years	Russian, Arabic	Parents
Child 3	6 years	Russian, Arabic	Parents, Grandparents
Child 4	5 years	Russian, Arabic	Parents
Child 5	4 years	Russian, Arabic	Parents, Grandparents
Child 6	7 years	Russian, Arabic	Parents

5. DATA ANALYSIS AND RESULTS

5.1. Milestones Of Speech Delay and Expressive Abilities

According to Genesee and Nicoladis (1997), a bilingual child may indeed have a speech or language problem requiring intervention. In this case, accurately distinguishing between children whose development falls within the normal individual variation and children whose development is pathological or impaired should be done by speech-language pathologists. Deuchar and Clark (1996) claim that an initial lack of differentiation between languages occurs in early phonological development in bilingual children. According to Gutierrez Clellen et al. (2008) and Paradis et al. (2003), there is no evidence that bilingual exposure leads to additional speech delays for children with language impairments. However, a number of studies (Werker & Tees, 1984; Werker & Byers-Heinlein, 2008) have shown that typically developing infants or young children are sensitive to vocal or phonetic contrasts across languages that older children do not perceive; there appears to be a critical period for heightened speech perception and discrimination during the first year of life. In terms of vocabulary production, bilingual children at four years old, on average, have fifty percent of each language compared to monolingual children (Doyle et al., 1978).

A child with speech delay manifests a delay in the use of the mechanisms that produce speech or the actual process of making sounds. A common sign of speech delay is when a child is not meeting the language developmental milestones for their age. After comparing them with monolingual children, the bilingual children appear with some milestones of speech delay, first using code-switching, the discourse of bilingual children parents confirms that

their children use code-switching at early stages of speech until 5 years old what illustrates that they don't differentiate the which language to use with the interlocutors surrounding them, a research by Gutierrez-Clellen et al. (2008) indicates that frequent code-switching may hinder language differentiation and overall language proficiency in bilingual children, potentially leading to delays in speech development compared to monolingual counterparts. When a child (or an adult) switches back and forth between two languages in the same sentence, using both with fluency, it is called "code-switching." This means that the speaker is actively using both languages. He or she is, in effect, thinking bilingually, and using all the available language skills for self-expression. Gestures in language acquisition are a form of non-verbal communication involving movements of the hands, arms, and/or other parts of the body. Children can use gestures to communicate before they have the ability to use spoken words and phrases. In this way gestures can prepare children to learn a spoken language, creating a bridge from pre-verbal communication to speech (Namy1998). The onset of gestures has also been shown to predict and facilitate children's spoken language acquisition (Susan et.al 2000). Once children begin to use spoken words their gestures can be used in conjunction with these words to form phrases and eventually to express thoughts and complement vocalized ideas. (Ibed,2000) Gestures not only complement language development but also enhance the child's ability to communicate. Gestures allow the child to convey a message or thought that they would not be able to easily express using their limited vocabulary. Children's gestures are classified into different categories occurring in different stages of development. The categories of children's gestures include deictic and representational gestures (McNeill, David 1992). However, it can be seen as a

sign of delay, children at age 5 are unable to produce simple words like pen and use gestures to deliver their ideas cannot be considered as healthy developmental milestones. Many children begin by communicating through gesture and over time replace gesture with speech (Bates, Benigni, Bretherton, Camaioni, & Volterra, 1979; Bates & Dick, 2002; Iverson, Capirci, & Caselli, 1994). Early gesture use not only precedes subsequent vocabulary development, it also predicts subsequent vocabulary production and comprehension (Goldin-Meadow & Butcher, 2003; Iverson & Goldin-Meadow, 2005; O'Reilly, Painter, & Bornstein, 1997; Rowe & Goldin-Meadow, 2009a,b; Rowe, Özçaliskan, & Goldin-Meadow, 2006a,b; Rowe et.al 2008), this occurs when child at early stage (see Rowe and colleagues 2008) found that the number of different meanings children conveyed with their gestures at 14 months was significantly related to the size of their receptive vocabularies at 42 months. But what in the case of our participants, these bilingual children at 5 years old and still use gestures as their parents mentioned.

In parents' interviews, they report that comprehension in Arabic is comparatively stronger, children understand stories, follow multi-step instructions, know many words. However, when asked to express similar content, the expressive output is much weaker this shows a gap between what they know and what they can produce fluently.

C1: *"I sometimes lose my patience while listening to him, I do my best to keep listening, he utters a couple of words then... silence or errgrrrr or I mean I mean"*

C3: *"because they learn in Arabic in school, I really want to talk to them in Arabic, but I turn to Russian as they need more time expressing themselves in Arabic"*

Beyond silence, there are many hesitations ("um", "eh") and repeated self-corrections. Children stop, restart, reformulate clauses or phrases. These hesitations occur especially when the vocabulary needed is less familiar (e.g. abstract words, temporal connectives, adjectives) or when constructing longer or complex sentences. The filler "errgrrrr" works like a paralinguistic marker, it externalizes cognitive struggle and signals to the listener "please wait, I'm still working on this idea." They also suggest the child knows what they want to say but struggles to retrieve the exact word(s). This is common in bilingual children when one language is weaker (Paradis, Genesee, & Crago, 2021). Speech planning load refers to the cognitive effort required to transform an intended message into spoken language, encompassing the stages of

conceptualizing the idea, retrieving appropriate vocabulary, selecting grammatical structures, and sequencing elements into a coherent utterance (Levelt, 1989). In bilingual children, particularly when using Arabic as a less dominant language, this load is heightened because they must simultaneously suppress interference from the other language while navigating Arabic's morphosyntactic complexities, including gender, number, person agreement, and verb-subject ordering (Ryding, 2014). As a result, long pauses frequently occur at the onset of sentences: before articulation begins, the child is engaged in intensive internal preparation, retrieving lexical items, deciding on correct morphological forms, and organizing the sequence of ideas to fit Arabic grammar. These pauses are therefore not indicative of disengagement but reflect genuine planning difficulty, often leading to shortened or simplified utterances as children favor structures they can produce fluently (Kormos, 2006). Empirical research demonstrates that the heaviest cognitive load occurs at sentence initiation, especially in bilingual contexts, where lexical retrieval and syntactic mapping challenges are more pronounced (Paradis, 2016). In Arabic-speaking children, specific difficulties with verb morphology and clause construction further contribute to these onset delays, prolonging pauses and increasing hesitations (Ryding, 2014). Overall, the observed silences reveal the child's hidden mental effort in organizing vocabulary, grammar, and discourse.

5.2. Code-Switching Reliance

Code-switching reliance is a common strategy among bilingual children, especially during the early stages of language development, when vocabulary or grammatical resources in one language may be insufficient to fully convey a thought. In the context of Russian-Arabic bilinguals, children often substitute Arabic words or phrases with their Russian equivalents, drawing on lexical knowledge that is more readily accessible to them. This strategy can, however, lead to pragmatic misjudgments, particularly in interactions with interlocutors who do not share Russian as a language of communication, such as grandparents, teachers, or monolingual peers. Observations indicate that children sometimes assume mutual comprehension, inserting Russian words into conversations with the expectation that others will understand, which can result in communication breakdowns or misunderstandings. This reliance on cross-linguistic equivalences highlights both the benefits and challenges of early bilingualism: while children can maintain

communicative intent by drawing on their full linguistic repertoire, they may also demonstrate limited awareness of the interlocutor's language knowledge, reflecting underdeveloped metapragmatic skills. Over time, as bilingual children gain greater proficiency and exposure in both languages, they typically adjust their code-switching behavior, learning to restrict the use of one language to contexts where interlocutors share that knowledge, and developing strategies to repair communication when mismatches occur (Genesee, Paradis, & Crago, 2011). In essence, early code-switching reflects a cognitive and linguistic adaptation, allowing children to negotiate expressive limitations, while also underscoring the gradual emergence of social and pragmatic competence in bilingual interactions.

C2: "yes, they used to do it when they were 3 years, I remember once my son Hisham said to his grandmother "بدي اروح على جده" рынок", it's "grandma, I want to go to the market".

C4: Yes, my child did that at first day at school, he told his teacher during the break "я голоден شيبس" "I want to eat chips.

The examples provided by caregivers illustrate typical patterns of early code-switching in bilingual children, reflecting both lexical retrieval strategies and pragmatic challenges. In the first instance, a child at age three inserted the Russian word "рынок" into an otherwise Arabic sentence addressed to his grandmother, producing "جده بدي اروح على" ("Grandma, I want to go to the market"), while in the second, a child combined Russian and Arabic during a school break, saying "я голоден شيبس" ("I want to eat chips") to a teacher. These instances highlight how young bilinguals initially rely on lexical equivalences from one language to compensate for gaps in the other, even when interlocutors may not understand the substituted language. Pragmatically, this demonstrates limited awareness of the listener's linguistic knowledge, a feature commonly observed in early bilingual development, as children assume shared comprehension across contexts. Such behavior underscores the dual nature of code-switching: it serves as a communicative strategy enabling children to maintain expressive intent despite linguistic constraints, yet it can also lead to misunderstandings when interlocutor knowledge is mismatched. Over time, as metalinguistic and social-pragmatic awareness develops, children typically refine their code-switching use, learning to align language choice with the interlocutor's linguistic competence (Genesee, Paradis, & Crago, 2011). These examples therefore provide concrete evidence of the

interplay between lexical access, expressive ability, and emergent pragmatic competence in bilingual children.

5.3. Phonetic Development

The findings indicate that students aged 6–7 years experienced noticeable difficulty in the accurate production of several Arabic consonants absent from the Russian phonemic inventory. In particular, persistent errors were observed in the articulation of pharyngeal consonants (/ħ, ʕ/), emphatic consonants (/ʕ, ʔ/), the uvular plosive (/q/), and the interdental fricative (/θ/). These sounds were frequently realized through substitution with acoustically or articulatorily proximate segments available in the learners' first language, such as alveolar or velar consonants, or were weakened or deleted altogether. Given the young age of the participants, these patterns suggest that the difficulties are attributable not only to incomplete articulatory control but also to negative phonological transfer from Russian, which lacks comparable places and secondary articulatory features. The results align with previous research in cross-linguistic phonological acquisition, demonstrating that marked consonants involving non-coronal or pharyngeal articulations pose sustained challenges for early bilingual and second-language learners. These findings highlight the role of first language phonemic repertoires in shaping bilingual children's acquisition of non-native contrasts and underscore the persistence of negative transfer in early bilingual contexts.

6. CONCLUSION

This study investigated the language development of Russian/Arabic bilingual children, with emphasis on expressive abilities and phonological acquisition in Arabic. The findings show that bilingual development in this group is uneven rather than disordered. Although receptive skills in Arabic were relatively strong, expressive language was characterized by hesitations, extended pauses, reliance on gestures, and frequent code-switching, particularly beyond early childhood. These patterns reflect increased cognitive and linguistic processing demands when producing a less dominant language, rather than pathological delay.

Code-switching functioned as a compensatory strategy to overcome lexical gaps and maintain communication, while also revealing developing pragmatic awareness. Phonological analysis revealed persistent difficulty with Arabic consonants absent from the Russian phonemic inventory, including

pharyngeal, emphatic, uvular, and interdental sounds, indicating negative phonological transfer.

The findings offer practical guidance for both speech pathologists and educators by clarifying which features such as code-switching, uneven vocabulary distribution across languages, and phonological substitutions reflect typical bilingual development rather than disorder. This clarification

is especially important in minority bilingual contexts, where limited research may increase the risk of overdiagnosis or misdiagnosis. By providing empirical data on Russian/Arabic bilingual development, the study supports more accurate interpretation of bilingual language patterns in both clinical and educational settings.

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