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Speech Sound Disorders of Children With Mental Delays

Original scientific paper

Muljaim Kacka, Bardha Kika, Elina Morina and Sevdije Marmullaku

Department of Speech Therapy, College Heimerer, Kosovo

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Abstract

This study aimed to investigate the speech sounds processes of children diagnosed with mental delays. Additionally, we explored all the sounds of the Albanian language, in level of articulation. We recruited 50 children, including 25 boys and 25 girls, with a mean age of 7.68 years. The results support the hypothesis that children diagnosed with mental delays are prone to speech sounds difficulties. Therefore, emphasizing the importance of possible risks in communication level is needed in order to address the needs of children with mental delays. Finally, this study is one of the first that investigated the phenomena of speech sounds difficulties in children with mental delays in Kosovar context.

Keywords: *speech sounds difficulties, children with mental delays*

How Speech Sound Disorders Can Be Conceptualized and Defined?

Speech sound disorders are known as the process of speaking which involves oral muscle movement, articulator movement (lips, mouth, teeth, jaw, soft palate, hard palate) in order to pronounce sounds (Bedore & Pena, 2008). Any dysfunction of oral muscle movement or articulator movement might result in communication or speech issues for a person diagnosed with speech difficulties.

Speech sound disorders are considered to be an important element of word formation and production. It involves acoustic signals produced by oral movements, hence any error in articulation is linked with articulatory apparatus (Fey, 1992). Consequently, articulation targets how the speech sounds are made, voice production, and fluency of speech. Thus, any children diagnosed with speech difficulties can follow articulation or phonological therapy with any licensed speech and language therapist (Lousada et al., 2012; Toki & Pange, 2010).

Speech sounds disorders are manifested when a child can't pronounce a sound or a group of sounds correctly (APA, 2013). Such difficulties represent the most common difficulties among children diagnosed with any speech disorder. They are more prevalent for preschool-age children, and usually are resolved by age 6 (Sices et al., 2007). Often such difficulties can be genetic, or caused by unknown factors (Toki & Pange, 2010). Genetic factors are determined by neurodevelopmental characteristics causing potential difficulties such as intellectual delays, hearing loss, autism, Down and Fragile X syndromes

Correspondence to: Bardha Kika Kolegji Heimerer, Kosovo
Email: bardha.kika@kolegji-heimerer.eu

(Guerra & Cacabelos, 2019), corresponding with significant impairments in speech and language development (van der Meer et al., 2012).

Speech Sound Processes in Children With Developmental Delays

One of the main issues of children dealing with mental delays in general terms of speech and language production is phonological decoding of grapheme-phoneme connection. Hence this can also impact their decrease of social skills, writing skills, expressive and receptive language (Beukelman & Mirenda, 2013). Speech sounds disorders become more evident when pronouncing different sounds while talking or having a conversation with others for multiple reasons such as; hearing loss, cleft palate, oral problems related to tooth decays, or tongue-tie known as ankyloglossia (Ramou & Guerti, 2014). The author, Memisevic & Hadzic (2013) found that children with mental delays are more prone to speech sound difficulties. More specifically, the majority of children diagnosed with mild and moderate mental delays had speech sound difficulties. The highest prevalence was found in children with Down Syndrome, followed by children with organic brain damage, genetic causes, and unknown etiologies.

Such difficulties have shown to be related with lower communication skills, which in turn impact people's educational and employment prospects, thus it provides less chance for social integrity (Bryen et al., 2007). Therefore, it became essential to advocate for improving communication skills of children with mental delays. Sutherland et al., (2014) also noted that this sample might deal with unfulfilled communication needs. Hence identifying possible risks that might contribute to communication problems attributed to speech sound difficulties remains an important mechanism in addressing the needs of children with mental delays. More specifically, the present study aims to identify the level of speech sounds difficulties of children with mental delays, and also identify how different group sounds are pronounced, in Kosovar context, and explore gender differences in this regard, we hypothesize that children with mental delays are prone to articulation difficulties and that there is a gender difference in this aspect (*nondirectional effect*). Since there is no study that confirms that a specific gender is more prone to articulation processes in Kosovar context, we assume that such difficulties exist and are prevalent, but would like to explore the level of gender in this aspect.

Methods

Participants

Fifty participants were recruited, 25 of whom were females. The mean age of the sample was 7.68, SD = 1.73. We included children diagnosed with developmental delays such as lower level of reported intelligence (IQ). Participants from both urban and rural areas were involved. The mean age of participants was M = 7.68, SD = 1.73.

Instrument

We used the Articulation Test (Kacka & Poposka, 2022) more information can be found at Dukovska (2022) articulation test review, for measuring the articulation capabilities of the participants. The first section included demographic information such as age, gender, class, location, parents' job, number of family members. For the second section, we asked the participants to pronounce vowels, followed by consonants. The vowels and consonants are measured in three positions: Initial, Medial, and Final. In the Albanian language, the consonants are divided into labial (*p, b, m, v, f*), dental (*t, th, d, dh, ll*), pre-palatal (*k, g, h, c, sh, xh, zh*), palatal (*q, gj, j, nj*), and alveolar (*c, x, n, s, z, l, r, rr*).

Procedure

We only tested participants whose parents filled out consent form in advance. We informed them that their participation is completely voluntary, and they can leave without penalty if requested. The testing was done by professionals in the speech and language field, and it took around 25 minutes to complete. All of the data were analyzed using the Statistical Package for Social Sciences (SPSS), version 21. We performed t-test analysis to compare gender differences

on articulation level and correlation analysis to explore the relationship between sounds group in initial, medial, and final position.

Results

Descriptive Statistics

The descriptive statistics have shown that dental and pre-patal sounds were the most problematic ones in pronunciation. The "Th" sound, both at the initial and medial levels, is particularly challenging for pronunciation. Only 28% of participants pronounced it correctly, while a significant 72% struggled with pronunciation. The Dh, Ll, and K, sounds, found at the initial level, have similar difficulties, with only 28% of participants pronouncing them correctly. The majority, 72%, mispronounced these sounds. This indicates a common challenge in articulating these particular sounds and suggests that they may share some phonetic features that make them problematic. Lastly, at the medial level, G and SH sounds are challenging for 28% of participants, while 72% struggle with them. However, it's interesting to note that SH has a slightly better correct pronunciation rate compared to G at the medial level.This difference might indicate that SH is somewhat less challenging in this specific context. All of the descriptive statistics, with their respective positions, which were more problematic to pronounce are shown in Table 1.

Table 1.
Correct and incorrect pronunciation of dental and pre-palatal sounds

	Th (initial level)	Dh (medial level)	Ll (initial level)	K (medial level)	G (medial level)	SH (initial level)
Correct pronunciation	28%	34%	28%	28%	28%	38%
Incorrect pronunciation	72%	66%	72%	72%	72%	62%

Gender Differences on Articulation Level

The t-test analysis has shown that there is a significant difference between girls and boys in the articulation process only for palatial sounds. In all three levels, the p-values are $p < .001$, with higher pronunciation scores for girls. This suggests that there are substantial gender-related variations in the pronunciation of these sounds.

Table 2.
Gender differences on speech sound disorders

	Mean	**SD**	**F**	**Sig.**	**t**	**Sig. (2-tailed)**
Dental Initial			.78	.38		
Boys	4	1.04			-.517	.60
Girls	4.16	1.14				
Dental Medial			.78	.38		
Boys	4	1.04			-.517	.60
Girls	4.16	1.14				
Dental Final			.78	.38		
Boys	4	1.04			-.517	.60
Girls	4.16	1.14				
Pre-palatal Initial			.70	.40		
Boys	5.64	.95			-.137	.89
Girls	5.68	1.10				
Pre-palatal Medial			.70	.40		
Boys	5.64	.95			-.137	.89
Girls	5.68	1.10				
Pre-palatal Final			.70	.40		
Boys	5.64	.95			-.137	.89
Girls	5.68	1.10				

Table 2.
Gender differences on speech sound disorders - continum

Palatal Initial			27.90	**.001**		
Boys	3.84	.37			-2.138	.03
Girls	4	0				
Palatal Medial			27.90	**.001**		
Boys	3.84	.37			-2.138	.03
Girls	4	0				
Palatal Final			27.90	**.001**		
Boys	3.84	.37			-2.138	.03
Girls	4	0				
Alveolar Initial			.23	.63		
Boys	7.04	.97			-.284	.77
Girls	7.12	1.01				
Alveolar Medial			.23	.63		
Boys	7.04	.97			-.284	.77
Girls	7.12	1.01				
Alveolar Final			.23	.63		
Boys	7.04	.97			-.284	.77
Girls	7.12	1.01				

Additional Results

We also explored the relationship between sounds groups in three levels (initial, medial, final). The results showed that there is a strong positive correlation within each sound category. This is expected, as a sound category will always have a perfect correlation with itself.

Additionally, there are negative correlations between dental, pre-palatal, and alveolar sounds. This indicates that as the pronunciation of one group (e.g., Dental) improves, the pronunciation of the other group (e.g., Pre-palatal) tends to decrease, and vice versa. Other effects are non-significant. More information is found in the table below.

Table 3.
Correlation analysis table

	Dental Initial	Dental Medial	Dental Final	Pre-palatal Initial	Pre-palatal Medial	Pre-palatal Final	Palatal Initial	Palatal Medial	Palatal Final	Alveolar Initial	Alveolar Medial	Alveolar Final
Dental Initial	1	1.00**	1.00**	-.472**	-.472**	-.472**	.091	.091	.091	-.349**	-.349**	-.349**
		.001	.001	.001	.001	.001	.26	.26	.26	.006	.006	.006
Dental Medial	1.00**	1	1.00**	-.472**	-.472**	-.472**	.091	.091	.091	-.349**	-.349**	-.349**
	.001		.001	.001	.001	.001	.26	.26	.26	.006	.006	.006
Dental Final	1.00**	1.00**	1	-.472**	-.472**	-.472**	.091	.091	.091	-.349**	-.349**	-.349**
	.001	.001		.001	.001	.001	.26	.26	.26	.006	.006	.006
Pre-palatal Initial	-.472**	-.472**	-.472**	1	1.00**	1.00**	-.099	-.099	-.099	-.195	-.195	-.195
	.001	.001	.001		.001	.001	.24	.24	.24	.08	.08	.08
Pre-palatal Medial	-.472**	-.472**	-.472**	1.00**	1	1.00**	-.099	-.099	-.099	-.195	-.195	-.195
	.001	.001	.001	.001		.001	.24	.24	.24	.08	.08	.08
Pre-palatal Final	-.472**	-.472**	-.472**	1.00**	1.00**	1	-.099	-.099	-.099	-.195	-.195	-.195
	.001	.001	.001	.001	.001		.24	.24	.24	.08	.08	.08
Palatal Initial	.091	.091	.091	-.099	-.099	-.099	1	1.00**	1.00**	.02	.02	.02
	.26	.26	.26	.24	.24	.24		.001	.001	.43	.43	.43
Palatal Medial	.091	.091	.091	-.099	-.099	-.099	1.00**	1	1.00**	.02	.02	.02
	.26	.26	.26	.24	.24	.24	.001		.001	.43	.43	.43
Palatal Final	.091	.091	.091	-.099	-.099	-.099	1.00**	1.00**	1	.02	.02	.02
	.26	.26	.26	.24	.24	.24	.001	.001		.43	.43	.43
Alveolar Initial	-.349**	-.349**	-.349**	-.195	-.195	-.195	.02	.02	.02	1	1.00**	1.00**
	.006	.006	.006	.08	.08	.08	.43	.43	.43		.001	.001
Alveolar Medial	-.349**	-.349**	-.349**	-.195	-.195	-.195	.02	.02	.02	1.00**	1	1.00**
	.006	.006	.006	.08	.08	.08	.43	.43	.43	.001		.001
Alveolar Final	-.349**	-.349**	-.349**	-.195	-.195	-.195	.02	.02	.02	1.00**	1.00**	1
	.006	.006	.006	.08	.08	.08	.43	.43	.43	.001	.001	

Discussion

After analyzing our data, we discovered that gender discrepancies exist in terms of speech sound proficiency. Specifically, our findings suggest that girls were experiencing more challenges with speech sounds, in contrast to boys. Girls were more prone to pronounce palatial sounds on three levels (initial, medial, final).

A similar finding was also noted at Ramou and Gerti (2014) study, conducted in Arabia. Even though the authors did not include children with mental delays, they found that girls were more prone to speech sound difficulties than boys.

Lastly, we calculated the difficulty of the sounds to articulate and found that the most difficult ones were (Th, Dh, Ll, K, G, Sh). These findings are consistent with Georgoulas et al., (2006) results. They conducted their study with typically developing children to identify which sound or phonemes are most likely to be mispronounced during articulation. Contrarily, to our sample targets, it is interesting to observe similar differences, in regard to speech sounds difficulties in both children with mental delays, and children with typical development.

The evidence also suggests that early intervention is crucial for improving speech and language development of children with mental delays. A study by Caselli et al., (1998) noted that children with mental delays, who benefited from early intervention showed significant language improvements in comparison with those who didn't. Interestingly, children who started therapeutical sessions before the age of three showed better language and communication skills than those who started later (Stoel-Gammon, 2001). This also emphasizes that the earlier the speech and language therapeutic intervention, the higher the chances for positive outcomes in language development. Speaking from a contextual viewpoint, professionals in Kosovo are still working on advocating the role of early intervention, hence it is crucial to emphasize the role of speech therapists and their importance of overcoming communication difficulties toward different samples.

Taken together, our results also provide practical implications for speech therapy interventions for children with speech sounds difficulties. Our data suggest that certain sounds are harder to produce, hence it also requires additional therapeutic support to achieve accurate articulation. Therefore, by targeting these specific sounds in speech therapy, professionals may be able to help children with mental difficulties to improve their speech sounds skills.

Additionally, the findings emphasize the importance of early intervention and ongoing therapy for children with similar difficulties, and mental delays, since it can help them achieve better communication skills, and improve their speech abilities.

Limitations and Future Research Directions

One of the main limitations of this study is not providing empiric information about why girls were more prone to palatial sounds pronunciation difficulties on three levels (initial, medial, final). Future research can be focused in this direction, and provide insights about pronunciation dynamics on palatial level, so more empirical information can be derived. Additionally, future research can also include different samples (e.g., children with disabilities, or children with typical development) and confirm if such patterns are similar in different samples. We also consider as an important limitation, not including a larger sample since it would provide a better understanding regarding the investigated difficulties that are specific to children with mental delays. Hence, upcoming studies might consider replicating our study with a larger sample size and provide further information on the field. Another limitation is not including additional variables. We did not explore if children benefited from speech and language therapy, and if yes, how long they are part of the therapeutic processes. Future studies can make a comparison between samples and investigate if there is a difference in speech sound level between children who benefited from speech and therapy sessions, and those who did not. Additionally, another limitation was not finding adequate resources on a national level. Our study is the first one, implying speech sounds difficulties of children with mental delays in Kosovo, and the possibility of making comparisons or further explorations was limited.

Conclusions

In conclusion, speech sounds difficulties are present among children with mental delays, impacting their communication skills and overall quality of life. From our findings, we emphasize the importance of early intervention which is critical for improving their communication abilities. Therapy sessions should be designed based on the child's needs and requirements, and toward children with mental delays a professional collaboration is needed between the speech therapist, parents, and family. Therefore, by providing adequate support, children with mental delays can overcome their articulation difficulties and improve their quality.

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