

THE STUDENT'S PRODUCTION OF SPEECH SOUND DISORDER AND ITS CAUSES

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Abstract: This research investigated the production of speech sound disorder student and the cause of student's speech sound disorder, precisely in stuttering type. Unicomb, Hewatt, Spencer, and Harrison (2017) considered stuttering as the lack of neurology condition which disturbs the speech's flow and erratic obstacle in communication process. There was only 1 participant involved in this study namely a student in one of vocational high school in Kuningan. This study used a qualitative approach, mainly case study that gathered the data through observation and interview. Based on the result, among three types of stuttering which are prolongation, repetition and blocks, the production of the participant that mainly occurred were repetition and blocks. Thus, the cause of the participant's stuttering was due to the lack of coordinator between the nerve and articulator and also it became worse because the anxiety.

Keywords: *Speech sound disorder; stuttering; production*

INTRODUCTION

The production of language stands as the ultimate stage of mastering communication with other people after the stages of acquisition and comprehension. Unfortunately, the problem occurs when the speech could not be uttered perfectly by the speech organs. Furthermore, it might be the barrier of communicating orally due to the lack of clarity in uttering the speech. Thus, the speech problems consist of three main types as mentioned by Prelock & Hutchins (2018). The first one is speech sound disorders as it is marked by the error production of speech sound, the second problem is fluency disorders which effect on the flow of speech, and the last is voice disorders which impact the quality of the sound stream. This research highlighted the speech sound disorder as the representation of speech problems found in the

student of vocational high school in Kuningan. Speech sound disorder affects the way human mispronounces some phonemes or words due to the lack of articulation organ as defined by Sugden, Baker, Munro, & Williams (2016) that children who suffer from speech sound disorder have difficulties to respond and represent the ideas with their articulation by concerning tones, rhythm, stress and intonation.

Nevertheless, children with speech sound disorder also suffer from many kind of speaking obstacles which influence their fluency and flow of utterances Furthermore, there are only a few types of speech sound disorder which are easily detected such as apraxia-of-speech, dysarthria, articulation disorder, hypernasality or stuttering (Shahin, Ahmed, Smith, Duenser, & Epps, 2019). Looking by those kinds of features mentioned above, the

speech sound disorders in this student clearly co-occurs with stuttering. As Unicomb, Hewatt, Spencer & Harrison (2017) stated that stuttering and speech sound disorder have been intertwined between each other and the rate is up to 30-40%. In other words, the percentage of stuttering might occur in speech sound disorders children is clearly high. Mohamadi, Madiseh & Sedehi (2016) explained that the term of stuttering used to explain the disorder that disturbed the pace and continuity of utterances. This research mainly concerns on how the production of language in student's speech sound disorder, in terms of speaking.

Moreover, the field that is not being revealed yet by the previous researchers is how the participant produces the speech despite the stuttering and its effect. The researcher conducted this research also due to the lack awareness of people to this kind of disorder in speech, especially for the teachers, parents, and peers on how to behave when they are facing the students who had the speech sound disorder. Teachers should know how to handle this student in the learning process, parents should embrace and put on effort to this kind of child, and also the peers should not be ignorant to people who have this kind of disorder. Having these reasons, the researcher is interested in conducting the research entitled "Student's Production of Speech Sound Disorders and Its Cause".

Production must be seen as a pivotal stage of language skill that people need to master. Because it will be useless if people only acquire and comprehend the language, but they do not apply it for daily activity and practical functions such as communicating with each other. Martin, Branzi, & Bar (2018) add that the function of language production is considered to be essential when it comes to the limitation of semantic meaning in the context of sentences. As a result, language production is considered to succeed when the interlocutor delivers the content and meaning that could be understood by other people. Similarly, Nozari and Novick (2017) said that producing a word includes several stages, and the first stage is semantic features. People normally create semantic features in their mind before uttering the word. Furthermore, the second stage of producing a word is lexical items. For instance, our mind consists of the clues and information that are later being spoken by our mouth, such as animal, four-legged,

pet, and meow. In reality, we say "cat" as the manifestation of the clues in our mind.

The researcher concludes that the language production stages mainly consist of the two stages; semantic features and lexical items, which ended when the speakers utter the word that they intended to. Somehow, the language production can be achieved fully and correctly by the time the speakers reached their adulthood.

In connection with language production, speaking also deals with the sequence of steps to create words and sentences as what MacDonald (2016) argued that arranging the speech needs some sequences to combine the words to be sentences and to gather the proper phonemes and syllables. Furthermore, this process also depends on the long-term and basic knowledge of the speakers, as it affects the way the speakers choose the range of words. In conclusion, speaking does not only seem like a sign of humans as social creatures. It also focuses on how our articulators work as a system to create the speech, and how the cognitive plays an important role to create an utterance. We could not ignore the term "speech" when it comes to the relation of speaking, speech is the way human communicates in a spoken way. Afroz and Koolagudi (2019) explained that speech is the natural form of communication in mankind which occurs alongside much interference like repetitions, hesitations, and pauses.

However, if the interferences appear more than it should be in an appropriate age of humans, it will lead to a problem in speech. Furthermore, the problem in speech consists of three varieties as what Prelock & Hutchins (2018) stated: (1) Speech sound disorders, which result in the misproduction of speech sounds and word shapes; (2) Fluency disorders, which interrupt the smooth flow of speech; and (3) Voice disorders, which impact the quality of the sound stream from the larynx. In brief, speech sound disorder is a problem that occurs in the phonological system of human utterances alongside any other disorders such as fluency and voice disorders that are being marked by the pronunciation errors that are not supposed to occur in a certain age. Unfortunately, there are only a few types of speech sound disorder which are easily detected such as apraxia-of-speech, dysarthria, articulation disorder, hypernasality or stuttering. (Shahin, Ahmed, Smith, Duenser, & Epps, 2019). The difficulties of detection in speech

sound disorder case urges parents to be more aware of their children's development.

Concerning to speech sound disorder, stuttering symptoms mostly co-occur in people who suffer from speech sound disorder. Stuttering is indicated by the way the speaker utters the sentences with many pauses and repetition of syllables, as it mentions by Unicomb et al. (2017) that stuttering considered as the lack of neurology condition which disturbs the speech's flow and erratic obstacle in communication process. Mohamadi et al (2016) also add that the symptoms of stuttering are marked by the repetitions of syllables in some words or phrases, delay speech or even sound blocking. stuttering seems likely to occur in anyone despite their gender, races, or physical appearances due to the unpredictable to whom it might suffer from. However, in term of gender ratio, Nang, Hersh, Milton, & Lau (2018) stated that stuttering is more likely to happen in males rather than females. The reason is believed due to the genetic factors that females are more resistant to inherit stuttering. Thus, the characteristics and causes of stuttering also vary depends on the stutterers' themselves.

Khan (2015) stated that the characteristics of stuttering divided into two kinds of behaviors. The first one is primary behavior as it can be observed easily by the researchers as it is characterized by these following features: (1) Repetition; (2) Prolongations; and (3) Blocks. Beside the primary behavior, Khan (2015) believed that secondary behaviors are the signal of stuttering symptom. This kind of behaviors are also known as escape behaviors as it is shown by the loss of eye contact, eye-blinking, head jerks and even hand tapping. In brief, the sign of stuttering symptoms can be detected by the surroundings environment as it is marked by the prolonging and blocking of sounds, repetition of syllables, and also the high amount intensity of pauses. Moreover, the gesture of the person also can be an indication of having speech sound disorders in term of stuttering.

Despite the physical reasons, Coleman (2018) argued that stuttering may be happened by physical tension, negative feelings and behaviors, also the avoidance of speaking situations. This idea is in line with what Afroz and Koolagudi (2019) have explained that stuttering marked by a set of indicators such as tension, extra effort in speaking and lack of fluency. By that means, the psychological factors also play crucial roles in the

condition of stuttering. Meanwhile, according to Sari (2017), the reasons of stuttering are divided into four different categories below:

Neurotic theories. In psychoanalytic field, stuttering is related to some types of unconscious neurotic needs. They believed that the cause of stuttering is based on stutterer's personality, mood and social skill. The main source of this cause is conflicts between child and parents or also known as parental pressure. However, this theory was opposed by many scientists as it does not form a group with other behavioral problems and it differs from emotional disorders in children.

Structural or physiological inadequacy theories. The scientists believe that stutterers are lack of capacity in physiological aspect in order to manage their utterances, so that the stuttering can occur easily. Furthermore, the stutterers are mostly left-handed people because only the right hemisphere of their brain is dominant, meanwhile it needs both sides of hemisphere to speak simultaneously. Thus, this problem is existed because of the lack of coordination between pronunciation, respiration and muscle of articulator.

Learning and conditioning theories. Based on this theory, stuttering occurs when the person is facing fear, anxiety and struggle during their speech.

Expectation of communication disrupting theories. This theory means that stuttering is most likely to occur if the person or child could not have the speech performance of what society demands them to be. The society tends to be biased and view them as immature in term of cognitive, linguistic, and affective skills.

On the other hand, Khan (2015) stated that there are five causes regarding stuttering includes:

Genetics. Children whose relatives are stuttered have a higher level tendency to stutter in their adulthood.

Physiological. Many researchers believe that an abnormal production exists on stutterer's speech production that is indicated by the breakdown and disfluent of speech.

Congenital. Physical trauma of the mother around children's birth also plays a vital role to be the cause of stuttering.

Auditory. Auditory deficit is considered as one of the cause of stuttering. The evidence is that the auditory cortex of stutterers is different compared to the normal ones.

Environmental. The children who faced stressful and demanding environment during their growth lead to the difficulties in developing their speech.

Regardless, the psychological factors also matter, such as avoidance of communicating with others and the fear of negative comments and behaviors as a feedback from other people in their surroundings. Those kind of psychological factors are decreased their self-esteem in facing the social situation.

METHOD

The research used qualitative method as an a approach to get the detail description and information in the process of conducting the research. According to Creswell (2007, p.37), “Qualitative research begins with assumptions, a worldview, the possible use of theoretical lens and the study of research problems inquiring into the meaning individuals or groups ascribe to a social or human problem.” In addition, qualitative methods were often being conducted to gain the further information of stuttering and its effect. Furthermore, the researcher applied case study as the design. Creswell (2007) stated that case study allows the researcher to investigate a case over time by looking into the detail data collection which consist of various source information such as observations, interviews, documents, and reports. Thus, the research of speech sound disorder, specifically in stuttering conducted by using qualitative descriptive method to gain the data of each variable.

The research used observation as one of the method to collect the data. Creswell (2007, p. 134) stated “observation requires addressing issues as the potential deception of the people being interviewed, impression management, and the potential marginality of the researcher”. During the observation in the participant’s classroom activities of English Language subject, the researcher recorded the participant’s utterances and communication skill, especially in speaking production.

Specifically, the researcher asked the participant to read the text consists of approximately 150 words entitled “True Friend” and talk about the simple

topic such as introduction in English. This type of observation is also known as stuttering severity instrument designed by Riley (1972).

Then, the utterances of the student will be identified into three types of stuttering like repetitions, prolongations, and also blocking during the speech. In order to ensure those types of stuttering, the recording will be visualized by the application named Praat. Thus, the repetitions of speech will be detected by the curve shown in Praat application. Aside from the student’s speech, the observation also focused on several gestures which is showing the difficulties of uttering the words without being stuttered.

Besides doing the observation, the researcher chose to conduct semi-structured interview with some questions that are prepared and also known as a structured interview. According to Given (2008), semi structured interview is a qualitative data collection strategy in which the researcher asks informants a series of predetermined but open-ended questions, thus the researcher has more control over the topic of interview. However, the questions are mainly related to the participant’s opinion about the stuttering and the reason why it happens.

In analyzing the data, to answer the research question researcher used some stages of data analysis in qualitative research: collecting data, preparing data for analysis, reading through data, coding the data, and reporting the findings

RESULTS AND DISCUSSION

The findings consist of the stuttering of student who has speech sound disorder and also the explanation of the stuttering’s cause which is conducted by interviewing the participant.

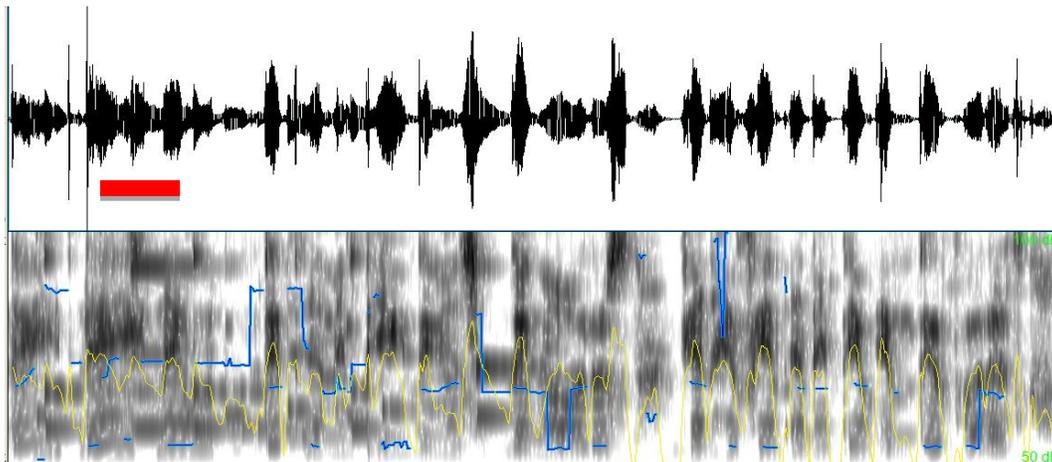
During the first observation, the participant was being asked to read English text entitled “True Friend” which has approximately 170 words. Afterward, the participant was being asked to do free-speech with the theme of short introduction. Within those two observations, the researcher examines the characteristics of stuttering in the participant’s speech by recognizing the primary behavior.

Table 1. *Types of stuttering in reading session*

No.	Words	Types of Stuttering		
		Repetitions	Prolongations	Blocks

1.	They-they knew that anything dangerous can happen any time in the forest.	√
2.	So they promised each other that-that-that they would always be together in any case of danger.	√
3.	One of them cli-climbed	√
4.	a nearby tree-tree at once.	√
5.	But... unfortunately the other one did not know how to climb up the tree.	√
6.	The bear came near the on-one	√
7.	It smelt in his ears, and slowly left the place-the place	√
8.	"Friend, what did the bear whisper-whisper into your ears?"	√
9.	"Just now the bear advised me not to believe-lieve a false friend."	√

Here are the picture showing using PRAAT of can happen any time in the forest.” The red the first utterance of stuttering in reading session underline shows the way she stuttered. which is: “**They-they** knew that anything dangerous



Picture 1. The use PRAAT of the first utterance of stuttering in reading session

Furthermore, the stuttering also appeared in short as explained in Table 2. when she is being asked to introduce herself

Table 2. Types of stuttering in speaking session

No.	Words	Types of Stuttering		
		Repetitions	Prolongations	Blocks
1.	I live-I live-I live [in] Cilebak.	√		
2.	My goal-my goal [is] director.	√		
3.	I study-I study at SMK.	√		
4.	I am- I am 17 years old.	√		

Among those three primary behavior the repetitions on the way she introduced herself characteristics of the way she read and spoke, briefly occur five times. Overall, the repetition repetition is the characteristics that appear most of occurred fourteen times, while the block only the time compared to the other two. As in the occurred once in the reading session. Furthermore, reading text observation, the amount of repetition in not only the production of speech that is being all over the text is nine times. While the blocking shown, the secondary behavior such as jaw-jerking only appeared in short amount of duration, also appeared as it is shown in the table below. approximately one half second. On the other hand,

Table 3. *Physical behavior*

No.	Physical Behavior	0	1	2	3	4	5
1.	Distracting Sounds. Noisy breathing, whistling, sniffing, blowing, dirking sounds					√	
2.	Facial grimaces. Jaw jerking, tongue protruding, lip pressing, jaw muscles tense				√		
3.	Head movement. Back, forward, turning away, poor eye contact, constant looking around				√		
4.	Extremities movement. Arm and hand movement, hands about face, torso movement, leg movement, foot taping or swinging	√					
Total		10					

Based on the result of the interview there were several points that found by the researcher, which will be explained in the paragraph below.

First, the participant mostly repeated the word such as in the word “cli-climbed”. Rather than prolong the words, she repeated the word often. Most of the time, she stuttered when she began to speak and read the first word. However, the participant’ stuttering usually disappears in a sudden, but suddenly re-appears in some words. Moreover, during the reading session, she found the difficulties in saying the word with the initial alphabet as in the words of “they” and “that”. Based on the findings, the repetitions that occurred in reading session is 9 times which the task score was 6 according to the stuttering severity instrument by Riley (1972), meanwhile the speaking introduction session which is considered as job session was only 5 that the task score was also 5. The total points of task score in both aspects were 11. Meanwhile, regarding the blocks that occurred during the reading session is only one half second and the task score is 2.

It is noticeable when the participant began to stutter, she began to speak with low volume. Meanwhile, in the term of secondary behavior, the participant tends to avoid eye contact when she stuttered, also the muscle tension near the mouth appear clearly with the head jerking.

Related to the stuttering severity instrument by Riley (1972), there are four physical behaviors that is shown during the stuttering which had the scale from 0 (not noticeable) up to 5 (severe and painful looking). The first aspect of secondary behavior was distracting sounds such as noisy breathing during the speech, the participant has the score 4 as it might be seen as very distracting during her speech. The second aspect was facial grimaces such as jaw-jerking and lip-pressing and the score was 3 as it was pretty distracting. The third is head

movement such as back forward turning away, due to the fact that the participant mostly turned her head while she was speaking, so the point was 3 as it is distracting to see. The last aspect was extremities movement such as hand movement during speech, but the participant was not doing the extreme movement during her speech so the score is 0. The total amount of score for physical behavior was 10. Furthermore, the total amount of the task score, blocks, and physical behaviors were 20 up to 23, with the percentile of 61-77, so that the participant is considered as the term of moderate stuttering.

Second, the cause of the stuttering is due to the convulsions that happened to her during her childhood as the participant said that. “My mother said that I often got convulsions whenever I got sick.” The convulsion was the first symptom that indicated the lack of coordination between her brain and articulator. Those lacks of coordination are noticeable when the participant speaks. In term of pronunciation, she speaks unclearly and also her heavy breath is somewhat noticeable whenever she reads or speaks. Moreover, the lack of coordination between muscles of articulator is indicated by her muscle tension around her mouth whenever she utters the speech. However, the participant claims that her mouth is not in pain whenever she chews foods and it means that the lack of her mouth’s function is only appear whenever she speaks.

Third, the cause of stuttering is not only because of the physiological inadequacy of the participant. It is also indicated that the participant will always be fearful and struggling during her speech. It is showed when she was being asked to read aloud in English and even to introduce herself briefly.

Later on, she also stated during the interview that when she was in the elementary school, her friends often mock the way she speak. Thus, it is

leded her to have an anxiety whenever she speaks and it is the cause of her stuttering.

CONCLUSION

After analysing the data in previous chapter, the researcher found that the production of language in the participant is commonly distracted because of the stuttering that appeared and noticeable. Among the primary behavior of stuttering which were prolongations, repetition, and blocks, the participant's stuttering mainly appeared as the repetition. During the reading session, the repetition occurred nine times, block only occurred once, while the prolongation was not found. On the other hand, during the speaking session of short introduction, the repetition appeared four times, while the other primary behavior was not occurred. The repetition is mostly appeared in the first syllable that the participant uttered.

The researcher also found the cause of stuttering of the participant. The first cause happened during the childhood of the participant, it is caused by the convulsions. Due to the convulsions, the lack of coordination between pronunciation, respiration and muscle of articulator existed. In term of pronunciation, the noticeable part is when the participant spoke unclearly with heavy breath. Moreover, the lack of coordination between muscles of articulator is indicated by her muscle tension around her mouth whenever she utters the speech. Meanwhile, the second cause of the participant's stuttering is due to her anxiety. The participant indicated that speech is seen as somewhat frightening activity in her daily life due to the struggling that the participant faced the most.

REFERENCES

- Asmoro, A. (2016). Penguasaan bunyi bahasa anak disabilitas tunarungu usia 10-12 tahun pada kata pasangan minimal di SDLB Santi Rama Jakarta : Suatu kajian psikolinguistik. *Linguistik Indonesia*, 34(2), 179-193.
- Coleman, C. E. (2018). Comprehensive stuttering treatment for adolescents: A case study. *Language, Speech, and Hearing Services in Schools*, 49, 33-41.
- Creswell, J. W. (2007). *Qualitative inquiry & research design*. California: SAGE Publications.
- Devianty, R. (2016). Pemerolehan bahasa dan gangguan bahasa pada anak usia batita. *Raudhah*, IV(1), 1-10.
- Douglass, J. E., Constantino, C., Alvarado, J., Verrastro, K., & Smith, K. (2019). Qualitative investigation of the speech-language therapy experiences of individuals who covertly stutter. *Journal of Fluency Disorders*, 61(1), 1-17.
- Ellis, A., & Hartlep, N. (2017). Struggling in silence: A qualitative study of six African American male stutterers in educational settings. *The Journal of Educational Foundations*, 30(1), 33-62.
- Freud, D., Brin, M. K., Ezrati, R. V., Roziner, I., & Amir, O. (2017). The relationship between the experience of stuttering and demographic characteristics of adults who stutter. *Journal of Fluency Disorders*, 52(1), 53-63.
- Given, L. M. (2008). *The SAGE Encyclopedia of Qualitative Research Methods*. Los Angeles: A SAGE Reference Publication.
- Hayiou-Thomas, M. E., Carroll, J. M., Leavett, R., Hulme, C., & Snowling, M. J. (2017). When does speech sound disorder matter for literacy? The role of disordered speech errors, co-occurring language impairment and family risk of dyslexia. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, 58(2), 197-205.
- Huber, A., Packman, S., Onslow, M., & Simpson, J. (2004). Improving our clinical interventions for stuttering: Can evidence from qualitative research contribute? *Advances in Speech Language Pathology*, 6(1), 174-181.
- Johan, M., & Susanto, A. (2018). Tataran fonem penderita strok pada masa terapi suatu kajian neurolinguistik. *Jurnal Kata*, 2(2), 192-204.
- Khan, N. (2015). The effect of stuttering on speech and learning process: A case study. *International Journal on Studies in English Language and Literature (IJSELL)*, 3(4), 89-103.
- MacDonald, M. C. (2016). Speak, act, remember: The language-production basis of serial order and maintenance in verbal memory. *Current Directions in Psychological Science*, 25(1), 47-53.
- Martin, C. D., Branzi, F. M., & Bar, M. (2018). Prediction is production: The missing link between language production and comprehension. *Scientific Reports*, 8(1), 1-9.
- Matondang, C. (2019). Analisis gangguan berbicara anak cadel (kajian pada perspektif psikologi dan neurologi). *Jurnal Pendidikan Bahasa dan Sastra Indonesia*, 3(2), 49-59.
- McDaniel, D., Cowart, W., McKee, C., & Garrett, F. M. (2015). The role of the language production system in shaping grammars. *Language*, 91(2), 415-441.
- Mohamadi, O., Madiseh, M. R., & Sedehi, M. (2016). The prevalence of stuttering, voice disorder, and speech sound disorders in preschoolers in

- Shahrekord, Iran. *International Journal of Child, Youth and Family Studies*, 7(3), 456-471.
- Morrish, T., Nesbitt, A., Zsilavec, U., Linde, J. V., & Roux, M. L. (2017). Sounds affecting the moments of stuttering in multilingualism: A case study. *Communication Disorders Quarterly*, 38(3), 154-160.
- Nang, C., Hersh, D., Milton, K., & Lau, S. R. (2018). The impact of stuttering on development of self-identity, relationships, and quality of life in women who stutter. *American Journal of Speech-Language Pathology*, 27(1), 1244-1258.
- Nippold, M. A. (2018). Stuttering in preschool children: Direct versus indirect treatment. *Language, Speech, and Hearing Services in Schools*, 49(1), 4-12.
- Nozari, N. (2018). How special is language production? Perspectives from monitoring and control. *Psychology of Learning and Motivation - Advances in Research and Theory*, 68, 179-213.
- Nozari, N., & Novick, J. (2017). Monitoring and control in language production. *Current Directions in Psychological Science*, 26(5), 403-410.
- Prelock, P. A., & Hutchins, T. L. (2018). *Clinical guide to assessment and treatment of communication disorder*. Cham: Springer International Publishing.
- Sari, H. (2017). An analysis of difficulties of children with stuttering enrolled in Turkish primary inclusive classes who encounter in academic and social activities: From their perspectives. *Journal of Education and Practice*, 8(2), 31-43.
- Shahin, M., Ahmed, B., Smith, D. V., Duenser, A., & Epps, J. (2019). Automatic Screening of Children with Speech Sound Disorders Using Paralinguistic Features. *IEEE*, 1-5.
- Simoni, S. N., Leidow, I. C., Britz, D. L., Moraes, D. A., & Keske-Soares, M. (2019). Impact of the speech sound disorders: family and child perception. *Revista CEFAC*, 21(3), 1-13.
- Smith, A., & Weber, C. (2017). How stuttering develops: The multifactorial dynamic pathways theory. *Journal of Speech, Language, and Hearing Research*, 60(9), 2483-2505.
- Sugden, E., Baker, E., Munro, N., & Williams, A. L. (2016). Involvement of parents in intervention for childhood speech sound disorders: a review of the evidence. *International Journal of Language and Communication Disorders*, 51(6), 597-625.
- Unicomb, R., Hewat, S., Spencer, E., & Harrison, E. (2017). Evidence for the treatment of co-occurring stuttering and speech sound disorder: A clinical case series. *International Journal of Speech-Language Pathology*, 19(3), 251-264.
- Wertzner, H. F., Francisco, D. T., Barrozo, T. N., & Pagan-Neves, L. O. (2017). Evidence for speech sound disorder (SSD) assessment. *Journal of Advances Language Pathology*, 275-298.
- Wren, Y., Harding, S., Goldbart, J., & Roulstone, S. (2018). A systematic review and classification of interventions for speech-sound disorder in preschool children. *International Journal of Language and Communication Disorders*, 53(3), 446-467.