Humanus: Jurnal Ilmiah Ilmu-Ilmu Humaniora
available at http://ejournal.unp.ac.id/index.php/humanus/index
Pusat Kajian Humaniora
Fakultas Bahasa dan Seni
Universitas Negeri Padang, Indonesia

Phonological and Morphological Factors of Indonesian Children's Stuttering

Reny Rahmalina[1,2], Dadang Sudana[1], Anisa Arianingsih[1,3], Neidya Fatma Sunendar[1], Aceng Ruhendi Saifullah[1]
[1]Universitas Pendidikan Indonesia, Indonesia
[2]Universitas Negeri Padang, Indonesia
[3]Universitas Komputer, Indonesia
*Corresponding Author: renyrahmalina@upi.edu

The aim of this research is to examine whether there is an influence of children who stutter (CWS) on linguistic factors (phonology and morphology) in Indonesian. This research is a case study research with quantitative methods. The method used was: five CWS were directed to spontaneously speak Indonesian with a stuttering examination validated by a speech expert. Transcribe recordings and mark stutters. Next, words included in the stuttering category were analyzed for their phonological and morphological characteristics. The results showed that words starting with a phoneme and a consonant in the initial position of the word had a higher level of stuttering. Word length, word class, and inflection at the end of the word did not have a significant effect on the level of CWS stuttering. Stuttering can occur in many languages and the linguistic structure of speakers varies.

Article History
Received: 8 November 2023
Accepted: 14 December 2023
Published: 14 December 2023

Keywords
Stuttering, Phonological, Morphological, Linguistic

How to cite:
Rahmalina, R., Sudana, D., Arianingsih, A., Sunendar, N. F., Saifullah, A. R. (2023). Phonological and Morphological Factors of Indonesian Children's Stuttering. *Humanus: Jurnal Ilmu-Ilmu Humaniora, 22*(2), 237-246. DOI: 10.24036/humanus.v22i2.125926

Introduction

Out of 1000 children, 20% suffer from temporary or permanent stuttering (Mohajeri Aval, 2023). This problem occurs due to various factors such as interference from the womb or lack of stimulus when communicating. Another problem is the lack of knowledge of parents on how to handle children with stuttering and most of them do not realize that their children have stuttering from the beginning. If it is known from the beginning, it will be easy for parents to overcome it and the child's stuttering does not continue to become permanent stuttering.

The development of research on stuttering in early childhood has been carried out. In the last few years, research on the theme of stuttering in the linguistic domain has been conducted. Research that reveals stuttering disorder is considered a multifactorial disorder (Farazi et al., 2022; Chang et al., 2019; Sugathan & Maruthy, 2021; Hosseini et al., 2018), which results in the complex interaction of several linguistic, cognitive, speech motor, and environmental factors. Among these various factors, there is a close

PRINTED ISSN 1410-8062
ONLINE ISSN 2928-3936
© Humanus: Jurnal Ilmiah Ilmu-Ilmu Humaniora

relationship between phonological and morphological factors in the field of linguistics and stuttering. Several studies show a relationship between morphological, phonological, syntactic and lexical factors and stuttering at the word and sentence level (Lago et al., 2021; Choo et al., 2023; Brundage & Bernstein Ratner, 2022). The previously mentioned factors are suggested to be the focus of attention in the treatment of stuttering.

Research suggests that children who have persistent stuttering disorder have delayed phonological skills compared to children who have temporary stuttering disorder (Salvago et al., 2019). CWS (Children with Stuttering) are observed to have problems with phrase-initial position at every level of their stuttering. Investigations supporting this assertion have been conducted by (Iimura et al., 2021) and (Alqhazo & and Alfwaress, 2022) in Japanese and Arabic. Choi et al (2020) and (Alqhazo & Al-Dennawi, 2018) found that letters at the beginning of words had a higher number of stutters. In another study, CWS experienced increased stuttering at clause boundaries compared to other locations (Li et al., 2018). Furthermore, findings from (Preston et al., 2022) revealed that there was increased stuttering in word-initial positions compared to other positions in English-speaking CWS.

Other research has shown that stuttering occurs in long words. It has been revealed that CWS experience stuttering on longer words (Brundage & Bernstein Ratner, 2022). Another cause is that there are consonant groups that are complex from a phonological perspective (Howland et al., 2019), so CWS must pay attention to articulation to make it more precise and allow for higher fluency disturbances. Consonant clusters are sounds that come after vowels and are suitable for children, teenagers and adults, but not for young children.

IPC or known as the Index of Phonetic Complexity (Chon, 2021) contains eight factors, namely: (1) consonants based on procedure; (2) consonants based on place; (3) vowels by class; (4) single consonants based on their place; (5) grouping based on place (6) word form; (7) word length (syllables); and (8) adjacent consonants. IPC is assessed based on the total score of the eight factors above. If the score on the IPC is high, it can be interpreted that the words spoken are classified as more complex words in terms of phonology.

Research that is often carried out in the morphological domain is stuttering with two groups of words such as content words and function words. Lexical units that stand alone and are meaningful and are an open collection of words are called content words. Content words consist of adverbs, adjectives, nouns and verbs, consisting of semantic meanings which tend to be complex in terms of phonetics and have longer word structures (Kang et al., 2020). Meanwhile, pronouns, prepositions, interjections and conjunctions, as well as auxiliary verbs are classified as function words, namely a closed set of words (Kim et al., 2019). Alqhazo & Alfwaress (2022) stated that the location of stuttering lies in the content words that are spoken spontaneously by the speaker. Based on the research reviewed previously, linguistics has characteristics that differ in languages throughout the world. Therefore, detailed research on stuttering from the influence of phonological and morphological factors in different languages is important. In Indonesian there are 32 phonemes consisting of six vowel phonemes, three diphthong phonemes and 23 consonant phonemes. In Indonesian, morphological studies consist of two types of morphemes, namely bound morphemes and free morphemes (Manipuspika et al., 2022).

There are not many studies examining children's stuttering in Indonesian compared to English and other languages. Sari et al., (2019) analyzed how the language or linguistic characteristics of children who stutter speak are influenced by familial neurotic factors, seen from the pronunciation of words and sentence structure, as well as the stages of

treatment for children who stutter. There were sound prolongations, insertions or additions, pauses and repetitions. As a result, the above characteristics occur in people who stutter. This incident was motivated by tension and anxiety when speaking. There are several things that can be done during treatment, namely being more patient when teaching according to the material, you can also treat children more calmly, and then aim to reduce stuttering, not cure it in a short time.

Next is research conducted by (Saragih, 2018), analyzing the form of language of children who experience fluency disorders (stuttering). Researchers observed as many as three children who experienced impaired fluency of speech (stuttering). This research data was obtained using descriptive methods with qualitative data analysis techniques, namely ways or techniques that reveal clear facts about the symptoms in a research object. The results of this research conclude that the language form of children who experience speech fluency disorders (stuttering) is a form of language repetition. In contrast to previous studies, this research reveals the stuttering of -age children in terms of linguistic namely phonological and morphological.

The evidence presented provides justification that linguistic factors (phonological and morphological) influence stuttering. Phonological and morphological factors experienced by each person are different in a language which can influence stuttering. Apart from that, previous research also revealed a lot of research with objects for adults and children. Information was obtained that stuttering that occurs in childhood is influenced by the child's language development. Therefore, it can be hypothesized that the pattern and direction of influence of linguistic factors may not be the same in each language. It can also be hypothesized that the influence of these factors may not be the same from one child to another. Therefore, researchers consider it important to raise studies on stuttering children who communicate using Indonesian from studies of phonology and morphology. Therefore, the aim of this study was to determine the influence of phonological and morphological factors on speech disorders in Indonesian-speaking CWSs.

Method

Quantitative descriptive approach by adopting listening methods and skill techniques. The subjects of this study were five children (3 boys and 2 girls) in the age range 3;0 to 6;0 years (mean 4.2, SD= 1.04). All participants were native Indonesian speakers and kindergarten students. The sample parents were asked to fill out a questionnaire containing their children's demographics, such as native language spoken and exposure to other languages, age at which stuttering occurred, use of the left or right hand, family history of stuttering, birth events, and their child's condition. History of the disease suffered, as well as whether there are problems related to stuttering. Furthermore, it was also confirmed that none of the samples had received speech therapy treatment at the time the research was conducted.

Researchers used SSI version 4 (Tahmasebi et al., 2018). The severity of participants' stuttering ranged from mild to severe (mild = 3; meduim = 2; severe = 1). Information about all participants can be seen in Table 1. Participants have receptive and expressive language ages with the M-RELT test for ages 3–7 years (Nayeb et al., 2019). Use of the DPAT test to find the sample's articulation abilities (Kant & Disabilities, 2018). Written information was also obtained from the parents of all participants.

Table 1
Description of Research Subjects

No. S	Age (Year, Month)	F/ M	Stuttering Level	SSI-4 Score	Left/ Right Handed	No Age of Onset of Stuttering (Year, Month)	Language Ability	Family History Stuttering
1	3,0	F	Mild	15	L	2,9	N	+
2	4,6	M	Medium	24	L	4,0	N	-
3	5,1	F	Medium	21	L	4,9	N	-
4	3,5	M	Severe	28	L	2,9	N	-
5	6,0	M	Medium	20	L	3,2	N	+

Initially the sample was placed in a comfortable room with sufficient lighting and then asked to speak spontaneously on several themes such as friends, family and interests for 15 minutes. The spontaneous speeches produced by the participants were recorded using a Sony ZV-1F. The recording was then transferred to the researcher's laptop in mp4 form. The researcher then carried out the transcription in stages: first using general IPA for the fluent speaking area and narrow transcription for the non-fluent area. The first and last fifty syllables were removed, and a sample of 500 syllables was considered for analysis. One-word answers/utterances are also removed. The first examination identifies and records the time of stuttering occurrence by listening to recorded samples using the Stuttering disfluencies (SLDs) classification (Didirkova et al., 2019) which includes blocks of word parts/syllables, lengthening, and repetition. Phonological factors include the frequency of stuttering regarding phoneme positions in phonemes, words, and word length. Phoneme positions in words include middle position and initial position. Stuttering in final position is not performed because this rarely occurs (Choi et al., 2020).

For the phoneme indicator, the number of stutters was compared for words starting with a consonant and starting with a vowel. Next, the length of the words spoken by the sample was categorized into one-syllable, two-syllable, three-syllable and many-syllable words. Word frequency, four or more syllables have a very low frequency obtained from the sample. Thus, words that have more than three syllables are called multisyllabic. The morphological factors in this research are lexical (word content) or word function, and inflectional morphology – free form or bound (with inflection). Noun ([mobIl], 'car'), verbs ([dətəŋ], 'come'), adjectives ([bЄsar], 'big'), and adverbs ([ləbIh], 'more') are considered content words, while prepositions ([kə above], 'up'), pronouns ([me], 'I'), conjunctions ([and], 'and'), and interjections ([sətəlah Itu], 'after that') are considered function words in research (Kim et al. 2019). Furthermore, function-content forms (content words with functional word endings, 'example' [cɔntɔh]) are considered content words with inflectional endings.

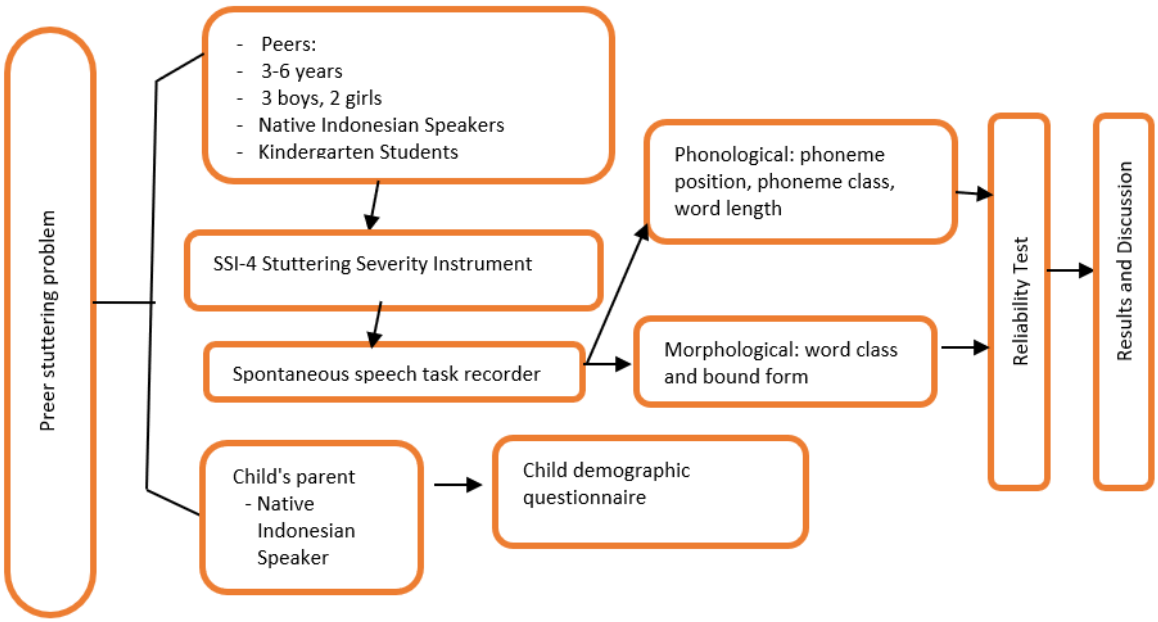
Phonological and morphological factors are calculated by adding the stuttering factor to the number of stuttering moments multiplied by 100 to obtain the percentage of stuttering (Alqhazo & Al-Dennawi, 2018). Table 2 explains the formula used for each factor carried out in this research.

Table 2
Stuttering Rate on Phonological and Morphological Factors

The Stuttering Rate	Factors
Morphological Factors	
[(∑content/function words where stuttering occurs)/∑content/function words]*100	Word Class
[(∑words inflection that cause stuttering)/∑words inflection]*100	Bound Form
Phonological Factors	
[(∑words with stuttering in initial/middle position)/ ∑words in which stuttering occurs]*100	Phoneme Position
[(∑words beginning with the vowel/consonant where stuttering occurs)/∑words beginning with the vowel/consonant]*100	Phoneme Class
[(∑syllables causing stuttering)/ ∑syllables]*100	Word Length

Reliability is measured by statistical analysis of all components according to research objectives. Non-normal data distribution ($p < 0.05$) is indicated by the Shapiro-Wilks test (Aslam, 2021), so a non-parametric test is needed. The influence of phoneme category, phoneme shape and phoneme position was carried out using the Wilcoxon test. Meanwhile, the Fregman test was carried out to determine the effect of word length. Significance is calculated using the formula $r=z/\sqrt{N}$, where 'r' indicates tyhe magnitude of the effect, 'z' is the test statistic calculated using SPSS, and 'N' is the number of samples. Cronbach's alpha is used to measure reliability with a value of $p = 0.05$.

Figure 1
Research flow



Result and Discussion

Reliability tests were carried out on samples of phonological and morphological variables, as shown in the table below.

Table 3

Stuttering Frequency of the Three Phonological Factors in Indonesian-speaking-aged-CWSs

Factor	Variable	Mean (%)	Median (%)	SD (%)
Phonological	Phoneme Position			
	Initial	96,65	99,5	4,01
	Middle	2,61	0,75	4,00
	Phoneme Class			
	Vowels	19,18	18,07	9,53
	Consonant	25,51	26,03	8,12
	Word Length			
	Monosyllabic	30,3	31,66	10,88
	Two-Syllable	20,47	21,71	7,86
	Three-Syllable	29,79	29,01	9,87
	Multisyllable	29,3	31,17	15,99
Morphologies	Word Class	19,17	17,88	9,45
	Related Forms	24,75	26,87	8,10

Table 4

The results of Wilcoxon's Signed Ranks Test

Measure	Z	p	r
Content words and function words	0.05	>0.05	0.11
Words and without inflection	0.33	>0.05	0.07

The table above (table 4) shows that there is no significant difference between content words and function words and the frequency of stuttering. Likewise, no significant differences were found in the frequency of stuttering on words and without inflections.

Based on Table 3, in the phonological factor, the position of the stuttering phoneme is only between the initial and middle positions, such as in the word [mɔkɔn/eat] because the possibility of stuttering in the final position of the word is very rare. reported in the literature (Seth & Maruthy, 2019). A comparison of the frequency of stuttering in word-initial and word-middle positions in this study showed that there were significant differences between the two positions, with a higher frequency of stuttering in the initial position. These findings corroborate previous research (Khasawneh, 2021; Brundage & Bernstein Ratner, 2022; Weidner et al., 2018; Singer et al., 2020; Choi et al., 2020; Usler, 2022; Lu et al., 2022) which It was revealed that stuttering in children often occurs in the initial position of words.

It was found that the level of stuttering in the sample was higher for words that started with consonants than for words that started with vowels. This finding is confirmed by several studies (Iimura et al., 2021; Seth & Maruthy, 2019; Aryal & Maruthy, 2022; Alqhazo & Al-Dennawi, 2018). As explained previously, consonants are considered more complex than vowels (Pathak et al., 2020), which have a higher degree of precision and

are therefore more susceptible to stuttering. These findings indicate that one of the causes of stuttering in children is the phonetically complex nature of consonants.

If it is observed that stuttering in children does not have a significant effect on word length. This is in line with research in English and Japanese which reveals that there is no influence between word length and stuttering in children (Seth & Maruthy, 2019; Preston et al., 2022; Iimura et al., 2021).

In the findings of CWS cases, the sample used was analyzed only for spontaneous speaking because their reading skills were not yet mature, especially in CWS. In addition, collecting data by speaking spontaneously allows children to avoid long words. In addition, because the subjects of this research were children and their language development was still developing, they simplified sentences that were long and complex from a phonological perspective. It was concluded that words consisting of more than three syllables or many syllables resulted in a low level of stuttering. Another factor in spoken Indonesian is the low frequency of words with a large number of syllables. Some words with many syllables are shortened to three syllables by removing vowels.

Word class is the first factor to consider in morphological skills. Frequency is seen from the comparison between content words and function words. The findings in this study differ from previous studies in that there is no significant influence of word class. Furthermore, other research states that the frequency of stuttering will increase in function words produced by CWS (Choi et al., 2020) and (Howland et al., 2019). In this study it was also seen that a high average percentage of stuttering occurred in content words, although overall no statistical significance was seen. Therefore, there are similarities between CWS and AWS (adults with stuttering) in the Indonesian-speaking population (Wahyuningsih & Afandi, 2020). However, the results of this research cannot be generalized, in-depth exploration is needed to prove the results of this research.

There are similarities with word class, in this study there was no significant influence of inflectional morphology. Inflectional morphology is an underexplored factor in stuttering and research on this subject is sparse. In a study conducted by Seth & Maruthy (2019), in English, it was found that word inflection had no significant effect on the level of stuttering in adults. This is different from the level of stuttering in CWS which is relatively high for inflectional words (Seth & Maruthy, 2019; Alqhazo & Al-Dennawi, 2018; Howland et al., 2019). The influence of word length and the complexity of the utterance also influences the high percentage of stuttering. The subjects of this research are CWS whose language development is still not perfect. Participants use a strategy by shortening utterances thereby reducing the length of words which will make the words easier to pronounce. This is one of the factors causing the low percentage of stuttering in inflected words. Therefore, not all function words from every language in the world have a positive effect on the frequency of stuttering experienced by its speakers. It can be concluded that the non-stuttering of speakers of a language is influenced by the structure of the language.

Conclusion

These findings reveal that word length does not affect phoneme position and sound type. Word class and free/bound forms do not have a significant effect on the frequency of stuttering when viewed from morphological factors. The results of this study strengthen the idea that stuttering can occur in different languages with different linguistic characteristics. For future research, comparisons between older adults and children should be made to provide insight into theoretical perspectives on childhood

stuttering, as well as discuss ways to understand trends across ages. Additionally, it will help address and minimize confounding factors that cause people to disentangle their linguistic (morphological and phonological) systems. Research would be more interesting if it analyzed in depth, especially on how syllable boundaries are affected, what types of consonants are involved, and the effect of consonant clusters on stuttering. Future research could also focus on more diverse populations from various languages in the world.

References

Alqhazo, M., & Al-Dennawi, S. (2018). The linguistic aspects of the speech of Jordanian children who stutter. *International Journal of Pediatric Otorhinolaryngology*, *109*, 174–179. https://doi.org/10.1016/j.ijporl.2018.04.003

Alqhazo, M., & Alfwaress, F. (2022). Stuttering frequency on content and function words in pre- and -age Jordanian Arabic-speaking children who stutter. *Psychology of Language and Communication*, *26*(1), 1–17. https://doi.org/10.2478/plc-2022-0001

Aryal, D., & Maruthy, S. (2022). Linguistic factors and stuttering in Nepali-speaking adults who stutter. *Clinical Linguistics & Phonetics*, 1–14. https://doi.org/10.1080/02699206.2022.2049880

Aslam, M. (2021). Analysing Gray Cast Iron Data using a New Shapiro-Wilks test for Normality under Indeterminacy. *International Journal of Cast Metals Research*, *34*(1), 1–5. https://doi.org/10.1080/13640461.2020.1846959

Brundage, S. B., & Bernstein Ratner, N. (2022). Linguistic Aspects of Stuttering. *Topics in Language Disorders*, *42*(1), 5–23. https://doi.org/10.1097/TLD.0000000000000269

Chang, S. E., Garnett, E. O., Etchell, A., & Chow, H. M. (2019). Functional and Neuroanatomical Bases of Developmental Stuttering: Current Insights. *Neuroscientist*, *25*(6), 566–582. https://doi.org/10.1177/1073858418803594

Choi, D., Sim, H., Park, H., Clark, C. E., & Kim, H. (2020). Loci of stuttering of English- and Korean-speaking children who stutter: Preliminary findings. *Journal of Fluency Disorders*, *64*(October 2019), 105762. https://doi.org/10.1016/j.jfludis.2020.105762

Chon, H. (2021). Comparing Phonetic Complexity between Fluent and Disfluent Eojeols in Adults Who Stutter. *Audiology and Speech Research*, *17*(1), 52–59. https://doi.org/10.21848/asr.200089

Choo, A. L., Greenberg, D., Li, H., & Talwar, A. (2023). Rate of Stuttering and Factors Associated With Speech Fluency Characteristics in Adult Struggling Readers. *Journal of Learning Disabilities*, *56*(1), 7–24. https://doi.org/10.1177/00222194221095265

Didirkova, I., Maguer, S. Le, Hirsch, F., Gbedahou, D., Didirkova, I., Maguer, S. Le, Hirsch, F., & Be-, D. G. A. (2019). Articulatory Behaviour During Disfluencies in Stuttered Speech. *International Congress on Phonetic Sciences*, 1–5.

Farazi, M., Hosseini Dastgerdi, Z., & Khavarghazalani, B. (2022). What is the role of auditory processing in stuttering? A mini-review of previous knowledge. *Hearing, Balance and Communication*, *20*(1), 1–7. https://doi.org/10.1080/21695717.2022.2033469

Hosseini, R., Walsh, B., Tian, F., & Wang, S. (2018). An fNIRS-based feature learning and classification framework to distinguish hemodynamic patterns in children who stutter. *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, *26*(6),

1254–1263. https://doi.org/10.1109/TNSRE.2018.2829083

Howland, C., Baker, E., Munro, N., & McLeod, S. (2019). Realization of grammatical morphemes by children with phonological impairment. *Clinical Linguistics and Phonetics*, *33*(1–2), 20–41. https://doi.org/10.1080/02699206.2018.1518487

Iimura, D., Takahashi, S., Fukazawa, N., Morita, N., Oe, T., & Miyamoto, S. (2021). Effect of linguistic factors on the occurrence of stuttering-like disfluency among Japanese-speaking children who stutter. *Clinical Linguistics & Phonetics*, 1–16. https://doi.org/10.1080/02699206.2021.2001048

Kang, L., Riba, P., Wang, Y., Rusiñol, M., Fornés, A., & Villegas, M. (2020). *GANwriting: Content-Conditioned Generation of Styled Handwritten Word Images* (pp. 273–289). https://doi.org/10.1007/978-3-030-58592-1_17

Kant, A. R., & Disabilities, H. (2018). *4 . Sinha , A . K . and Kant , A . (2016). Development of a Digital-based Test of Articulation in Marathi, Journal of Communication Disorders of AYJNISHD (D), DEVELOPMENT OF A DIGITAL BASED TEST OF ARTICULATION IN MARATHI AUTHORS : Anjali R . Kant Reader and Head of Department Speech and Language Pathology, AYJNISHD (D), Mumbai Dr . Ashok Kumar Sinha, AYJNISHD (D), Mumbai*. *1*(January 2016).

Khasawneh, M. A. S. (2021). The level of stuttering severity among students with learning disabilities in the English language. *Science and Education*, *2*(9), 215–224. https://cyberleninka.ru/article/n/the-level-of-stuttering-severity-among-students-with-learning-disabilities-in-english-language

Kim, N., Patel, R., Poliak, A., Wang, A., Xia, P., McCoy, R. T., Tenney, I., Ross, A., Linzen, T., Van Durme, B., Bowman, S. R., & Pavlick, E. (2019). Probing what different NLP tasks teach machines about function word comprehension. **SEM@NAACL-HLT 2019 - 8th Joint Conference on Lexical and Computational Semantics*, 235–249. https://doi.org/10.18653/v1/s19-1026

Lago, S., Mosca, M., & Stutter Garcia, A. (2021). The Role of Crosslinguistic Influence in Multilingual Processing: Lexicon Versus Syntax. *Language Learning*, *71*(March), 163–192. https://doi.org/10.1111/lang.12412

Li, X., Song, D., Zhang, P., Zhang, Y., Hou, Y., & Hu, B. (2018). Exploring EEG features in cross-subject emotion recognition. *Frontiers in Neuroscience*, *12*(MAR). https://doi.org/10.3389/fnins.2018.00162

Lu, Y., Wiltshire, C. E. E., Watkins, K. E., Chiew, M., & Goldstein, L. (2022). Characteristics of articulatory gestures in stuttered speech: A case study using real-time magnetic resonance imaging. *Journal of Communication Disorders*, *97*, 106213. https://doi.org/10.1016/j.jcomdis.2022.106213

Manipuspika, Y. S., Sudarwati, E., Astuti, Y., & Indhiarti, T. R. (2022). *Current Trends and Issues on Linguistics and Language Teaching Research*. Universitas Brawijaya Press.

Mohajeri Aval, N. (2021). The Effectiveness of Transcranial Direct Current Stimulation (tDCS) on Improving the Severity of Stuttering and Anxiety in -aged Children Who Stutter. Journal of Practice in Clinical Psychology, 9(3), 227- 236. https://doi.org/10.32598/jpcp.9.3.761.1

Nayeb, L., Lagerberg, D., Westerlund, M., Sarkadi, A., Lucas, S., & Eriksson, M. (2019). Modifying a language screening tool for three-year-old children identified with severe language disorders six months earlier. *Acta Paediatrica, International Journal of Paediatrics*, *108*(9), 1642–1648. https://doi.org/10.1111/apa.14790

Pathak, A., Calvert, G. A., & Lim, L. K. S. (2020). Harsh voices, sound branding: How voiced consonants in a brand's name can alter its perceived attributes. *Psychology and*

Marketing, *37*(6), 837–847. https://doi.org/10.1002/mar.21346

Preston, R., Halpin, M., Clarke, G., & Millard, S. (2022). Palin parent-child interaction therapy with children with autism spectrum disorder and stuttering. *Journal of Communication Disorders*, *97*, 106217. https://doi.org/10.1016/j.jcomdis.2022.106217

Salvago, P., Gorgone, E., Giaimo, S., Battaglia, E., Dispenza, F., Ferrara, S., & Martines, F. (2019). Is there an association between age at first words and speech sound disorders among 4- to 5-year-old children? An epidemiological cross-sectional study based on parental reports. *International Journal of Pediatric Otorhinolaryngology*, *126*, 109602. https://doi.org/10.1016/j.ijporl.2019.109602

Saragih, A. D. (2018). *Analisis Bahasa Anak Yang Mengalami Gangguan Kelancaran Berbicara (Gagap).* Universitas Muhammadiyah Sumatera Utara.

Sari, H., Gökdağ, H., & Kizilkaya, H. (2019). Evaluating Teachers' Opinions on Learning Difficulties of Stuttering Primary Students In Terms of Terms of First Literacy. *Journal of Modern Science*, *42*(3), 57–81. https://doi.org/10.13166/jms/112280

Seth, D., & Maruthy, S. (2019). Effect of phonological and morphological factors on speech disfluencies of Kannada speaking children who stutter. *Journal of Fluency Disorders*, *61*, 105707. https://doi.org/10.1016/j.jfludis.2019.105707

Singer, C. M., Hessling, A., Kelly, E. M., Singer, L., & Jones, R. M. (2020). Clinical Characteristics Associated With Stuttering Persistence: A Meta-Analysis. *Journal of Speech, Language, and Hearing Research*, *63*(9), 2995–3018. https://doi.org/10.1044/2020_JSLHR-20-00096

Sugathan, N., & Maruthy, S. (2021). Predictive factors for persistence and recovery of stuttering in children: A systematic review. *International Journal of Speech-Language Pathology*, *23*(4), 359–371. https://doi.org/10.1080/17549507.2020.1812718

Tahmasebi, N., Shafie, B., Karimi, H., & Mazaheri, M. (2018). A Persian version of the stuttering severity instrument-version four (SSI-4): How do the new additions to SSI-4 complement its stuttering severity score? *Journal of Communication Disorders*, *74*(April), 1–9. https://doi.org/10.1016/j.jcomdis.2018.04.005

Usler, E. R. (2022). Why Stuttering Occurs. *Topics in Language Disorders*, *42*(1), 24–40. https://doi.org/10.1097/TLD.0000000000000275

Wahyuningsih, S., & Afandi, M. (2020). Investigating English speaking problems: Implications for speaking curriculum development in Indonesia. *European Journal of Educational Research*, *9*(3), 967–977. https://doi.org/10.12973/EU-JER.9.3.967

Weidner, M. E., St. Louis, K. O., & Glover, H. L. (2018). Changing nonstuttering children's stuttering attitudes. *American Journal of Speech-Language Pathology*, *27*(4), 1445–1457. https://doi.org/10.1044/2018_AJSLP-18-0019