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VARIABILITY AND INCONSISTENCY IN SPEECH OF TYPICALLY DEVELOPING CHILDREN

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Abstract

Inconsistency in speech is often cited as an indicator of speech sound disorders and as a key factor for distinguishing between different subtypes. However, research has shown that variability is also present, and even expected, during typical speech development and is not random; it can be explained by various factors. The present study describes speech consistency in 62 typically developing Slovenian children aged 3 to 6 years and examines whether it is influenced by age, gender, word length and complexity. We prepared the first Slovenian speech consistency test for children, consisting of three repetitions of 25 words produced in a picture naming task. Overall, the observed consistency in children's speech was 81%, with a statistically significant improvement associated with age. Additionally, age had a significant effect on variability types: younger children showed more consistent incorrect productions than older children, while the percentage of correct consistent productions increased notably with age. Furthermore, almost all variable responses included at least one correct target realization. We found no significant relationship between speech consistency and gender, word length, or the presence of consonant clusters in words. The study makes a valuable contribution to our understanding of typical speech development and provides insights into which types of variability are still considered typical.

Keywords: consistency; variability; speech; typical development; speech and language therapy.

1 Introduction

Speech is a complex process that unfolds in stages. Around the first year, children's first words appear (Grobler 1985). Early on, words are learned as whole units (Ferguson and Farwell 1975), but children gradually become aware that words consist of syllables and sounds (Menyuk and Menn 1979, in Dodd et al. 2005). Since phonological and articulatory systems are still developing, early word productions are highly variable (Sosa and Stoel-Gammon 2006). However, little is known about typical token-to-token variability. By contrast, inconsistency is often cited as a hallmark of speech sound disorders (SSD) and is an important clinical criterion for distinguishing different subtypes of SSD (Holm et al. 2007).

Two terms describe variation in repeated word productions: *variability* and *inconsistency* (Sosa 2015). *Variability* reflects differences across repetitions due to typical speech development, often including both correct and incorrect productions. *Inconsistency*, in contrast, involves unpredictable errors across repetitions that cannot be attributed to typical development (Holm et al. 2007).

Previous research shows (Jones 2020; McLeod and Hewett 2008; Sosa 2015; Sosa and Stoel-Gammon 2006, 2012) that up to the age of three, a high degree of speech variability is still expected (ranging from 54% to 68%), and that large individual differences in the proportion of variability among children are common. After the age of three, the speech of typically developing children becomes increasingly consistent, which may be reflected in either consistently correct or incorrect productions (Holm et al. 2007, 2023; Jones 2020). Holm et al. (2007, 2023) observed that in typically developing children aged 3 to 6 years, most word productions are consistent and correct. Since the phonological system is still developing between the ages of 3 and 6, speech may exhibit some variability; however, variable productions predominantly include at least one correct production. In contrast, children with inconsistent phonological disorder (IPD) often produce variable productions without any correct realizations (Holm et al. 2005).

1.1 *Variability in typical speech development*

Research shows (Burt et al. 1999; Holm et al. 2007, 2023; Martikainen et al. 2020) that the speech of typically developing children aged between 3 and 6 years is 80–95% consistent (this means that children produce a specific word in the same way in 80–95% of all productions of this word) and that consistency is influenced

by factors such as age, gender, word length and complexity, and oromotor skills (Burt et al. 1999; Holm et al. 2007, 2023; Martikainen et al. 2020).

Sosa and Stoel-Gammon (2006) report high variability in one-year-olds as they begin producing first words, which rises again during phonological reorganization. Sosa (2015) found that children aged 2;6 (years; months)–2;11 were variable in 77% of productions, 3;0–3;5 in 68%, and 3;6–3;11 in 57%. Longitudinal studies confirm this trend, with variability declining from 60% at 1;9 to 19% at 2;9 (Stoel-Gammon 2004, in Sosa and Stoel-Gammon 2006), while Jones (2020) also showed that variability and the number of errors decrease with age. Holm et al. (2007) likewise found three-year-olds significantly more variable than older children, with 87% consistency at 3;0–3;5 compared to 97% at 6;0–6;11. This pattern was confirmed in a more recent study, showing that older children named words more consistently than younger ones (Holm et al. 2023).

Holm et al. (2007) reported that girls exhibited greater speech consistency than boys, who were more likely to produce consistently incorrect outputs and a wider range of errors across repetitions. Similar results were found by Holm et al. (2023), who observed slightly higher variability in boys' word production. This difference has been attributed to neurodevelopmental factors and preschool language experiences, with evidence that girls demonstrate superior language skills at ages 3–5 years (Bornstein et al. 2004) and acquire phonology earlier than boys (Holm et al. 2007).

Sosa (2015) reported that typically developing 2- and 3-year-olds showed high variability in longer words, with over 90% of four-syllable words produced variably across repetitions, compared to 50% of monosyllabic words. Variability was also greater in words with more complex phonological structures, including later-acquired consonants and consonant clusters (Macrae 2013; Sosa and Stoel-Gammon 2012). Similarly, McLeod and Hewett (2008) found that 53.7% of words containing consonant clusters were produced variably in children aged 2;0–3;4 years.

Oromotor skills, involving movements of the lips, tongue, and jaw, are fundamental to speech development (Green et al. 2000). In the first year, movements are broad and less controlled, becoming more coordinated between ages 1 and 2. Up until the age of 6 years, children develop more precise and coordinated articulatory

movements, with reduced amplitude and increased stability. By age 6, articulatory patterns approach adult-like precision, though some variability remains, reflecting limited motor control (Green et al. 2000). Studies confirm that children's speech movements are more variable than adults' due to immature motor planning, with variability decreasing throughout late childhood (Barbier et al. 2020; Smith 2006; Smith and Goffman 1998).

Barbier et al. (2020) noted that the speech of four-year-olds is substantially more variable than that of adults, largely due to immature motor control. Speech variability reflects an immature system of motor programming and planning (Barbier et al. 2020).

Williams and Stackhouse (2000) observed significantly higher consistency in diadochokinetic tasks among five-year-olds compared to three-year-olds. By age 5, most children approach stable and accurate patterns, marking the transition to a more coordinated and controlled phase of oromotor development.

1.2 *Inconsistency in speech sound disorders*

Typical variability differs from the atypical inconsistency observed in SSD. Children with childhood apraxia of speech (CAS) produce 58–64% of words inconsistently (Iuzzini-Seigel et al. 2017), whereas those with IPD produce 51–58% of words inconsistently, often without a single correct production (Dodd et al. 2024; Holm et al. 2005; McNeill et al. 2022).

To distinguish typical variability from atypical inconsistency, it is necessary to first examine and understand speech consistency in typically developing children and the factors influencing it. There is no available data on speech consistency of Slovenian children, and the existing speech assessment tools elicit only single-word productions, which do not allow assessment of consistency (Globačnik 1999; Ozbič et al. 2020, 2023). This indicates a need for developing new assessment materials and for systematic data collection within typically developing children.

The main aims of the present study are thus: (i) to describe speech consistency in typically developing Slovenian children aged 3 to 6 and (ii) to explore the relationship between speech consistency and age, gender, word length, and complexity.

2 Method

2.1 Participants

The sample included 62 children aged between 3;1 and 6;0 years. The sample was divided into three age groups: 3;1–4;0, 4;1–5;0, and 5;1–6;0 and included 34 girls and 28 boys (table 1).

Table 1. Sample structure by gender and age

Age group	Gender			
	Male		Female	
	n	%	n	%
3;1 to 4;0	6	21	8	24
4;1 to 5;0	8	29	12	35
5;1 to 6;0	14	50	14	41

Participants were typically developing children recruited in two kindergartens in Ljubljana. Exclusion criteria included hearing disorders, neurodevelopmental disorders, ongoing treatment by a speech-language pathologist or other specialist, and the use of a foreign language in the home environment. 75 parents received an information sheet about the study, gave written consent for children's participation and completed a short questionnaire about the child's development. After reviewing the developmental data, only the 62 children who matched all the criteria were included in the study. Throughout the study, anonymity of all participants and collected data was ensured.

2.2 Speech material

For the purpose of the study, we prepared the first assessment tool for evaluating consistency in Slovenian, the Consistency Test. The test includes 25 words (table 2) selected from the freely available existing materials for the assessment of phonological processes (Ozbič et al. 2020, 2023). In the absence of exact information about the frequency of words in Slovenian child speech, we turned to the existing materials that include words that are part of children's everyday vocabulary. Furthermore, the two existing materials allowed the selection of words differing in length and complexity. The selected words are one to four syllables long, include

simple syllable structures as well as consonantal clusters and all standard Slovenian speech sounds.

Table 2. Target words in the Consistency Test with their structure, number of syllables, and number of consonant clusters

Slovenian target word with English translation	Pronunciation	Word structure	Number of syllables	Number of consonant clusters
lev (eng. <i>lion</i>)	[ˈleu]	CVC	1	0
sok (eng. <i>juice</i>)	[ˈsok]	CVC	1	0
šal (eng. <i>scarf</i>)	[ˈʃal]	CVC	1	0
krof (eng. <i>doughnut</i>)	[ˌkrɔf]	CCVC	1	1
stol (eng. <i>chair</i>)	[ˈstou]	CCVC	1	1
slon (eng. <i>elephant</i>)	[ˈslɔn]	CCVC	1	1
miza (eng. <i>table</i>)	[ˈmiza]	CVCV	2	0
žoga (eng. <i>ball</i>)	[ˈʒoga]	CVCV	2	0
balon (eng. <i>balloon</i>)	[baˈlon]	CVCVC	2	0
hiša (eng. <i>house</i>)	[ˈxiʃa]	CVCV	2	0
žaba (eng. <i>frog</i>)	[ˈʒaba]	CVCV	2	0
zvezda (eng. <i>star</i>)	[ˈzvezda]	CCVCCV	2	2
drevo (eng. <i>tree</i>)	[drɛˈvo]	CCVCCV	2	1
sonce (eng. <i>sun</i>)	[ˈsontɕɛ]	CVCCV	2	1
škarje (eng. <i>scissors</i>)	[ˈʃkarjɛ]	CCVCCV	2	2
krava (eng. <i>cow</i>)	[ˌkrava]	CCVCCV	2	1
jagoda (eng. <i>strawberry</i>)	[ˈjagɔda]	CVCVCCV	3	0
očala (eng. <i>glasses</i>)	[ɔˈtʃala]	VCVCCV	3	0
čebela (eng. <i>bee</i>)	[tʃɛˈbela]	CVCVCCV	3	0
krokodil (eng. <i>crocodile</i>)	[krɔkɔˈdil]	CCVCVCCV	3	1
igrišče (eng. <i>playground</i>)	[iˈgriʃtʃɛ]	VCCVCCV	3	2
sladoled (eng. <i>ice cream</i>)	[sladɔˈled]	CCVCVCCV	3	1
nogavica (eng. <i>sock</i>)	[nɔɡaˈvitsa]	CVCVCCVCCV	4	0
čokolada (eng. <i>chocolate</i>)	[tʃɔkɔˈlada]	CVCVCCVCCV	4	0
pomaranča (eng. <i>orange</i>)	[pɔmaˈrantʃa]	CVCVCCVCCV	4	1

2.3 Procedure

Each child was tested individually in a quiet room in the kindergarten. The sessions were 10-20 minutes long, including two breaks, and were audio-recorded for later analysis.

Children named 25 pictures presented in sequence, from shorter, monosyllabic words to longer, four-syllable words. The picture-naming task was repeated twice more, resulting in three production attempts for each word. The repetitions of the task were separated by a short activity. If the child did not retrieve the word independently, we elicited it in another way (e.g. association or description, delayed imitation, or direct repetition). For each repetition, we maintained the same linguistic context for the given word.

2.4 Test reliability

The measurement characteristics of the Consistency Test are appropriate. The reliability level is very high, as indicated by Cronbach's alpha coefficient of 0.928. Content validity is also high, with a Lawshe's content validity ratio value of 0.836.

2.5 Analysis

Target words were segmented in Praat (Boersma et al. 2024) and transcribed based on listening and visual spectrogram analysis. In total, 1,550 words were included in the whole-word perceptual analysis.

Following transcription, we evaluated whether each production corresponded to the target word or not. Any production that did not match the adult target form was considered an error. Examples of errors included sound substitution, palatalization, gliding, epenthesis, interdental production, etc. Word productions that were identical across all three repetitions were evaluated as consistent. Identical productions included all three words produced correctly, or all three words produced with the same error. If the production did not match across the three repetitions, it was evaluated as variable. The percentage of variability was calculated by dividing the number of variably produced words by the total number of words (25) and multiplying the quotient by 100.

For statistical analysis, word productions were classified into one of the following categories:

- a) **consistent correct**: the word is produced identically across all three repetitions and matches the target word;
- b) **consistent incorrect**: the word is produced identically across all three repetitions but contains at least one error (phonological or articulatory);
- c) **variable with hits**: the word is not produced identically across all three repetitions, but at least one correct production is present;
- d) **variable without hits**: the word is not produced identically across all three repetitions, and all productions contain errors.

Absolute and relative frequencies were used to describe the sample in terms of gender and age group. Speech consistency was summarized using means and standard deviations. Prior to conducting inferential analyses, the assumptions of normality and homogeneity of variance were assessed using the Shapiro–Wilk test, and Levene’s test, respectively. A one-way analysis of variance (ANOVA) was performed to examine differences in speech consistency across age groups, with eta squared (η^2) reported as the effect size. Post hoc comparisons were conducted using Hochberg’s GT2 test, and effect sizes were expressed as Cohen’s *d*. Associations between types of variability and age groups were examined using the chi-squared test of independence, with Cramer’s *V* reported as the effect size. Post hoc analyses were conducted using *z*-tests, with effect sizes expressed as Cohen’s *b*. Differences in the proportions of variable-with hits versus variable-no hits were examined using chi-squared test, with effect size expressed as Cohen’s ω . Differences in speech consistency between boys and girls, between shorter and longer words, and between words without consonant clusters and those with consonant clusters were analyzed using independent-samples *t*-tests, with effect sizes expressed as Cohen’s *d*. The Bonferroni correction adjusted significance thresholds for all multiple comparisons, minimizing the risk of Type I errors.

3 Results

The mean percentage of speech consistency in the whole sample was 81% (SD = 19.02). The variability percentage among participants ranged from 0 to 72%, indicating considerable inter-individual variability. Most children had less than 50% speech variability. Children most frequently produced words consistently and correctly (63.9%), followed by consistently incorrect productions (17.3%), variable

productions with hits (13.2%), and rarely variable productions without hits (5.6%). Across all age groups, consistent correct productions predominated.

The results showed a significant effect of age on speech consistency ($F(2,59) = 6.32, p = .006$), with a large effect size ($\eta^2 = .21$). Games-Howell post-hoc comparisons of the group differences are shown in table 3. The oldest children (5;1–6;0) were, on average, significantly more consistent than the youngest children (3;1–4;0).

Table 3. Games-Howell post-hoc comparisons of the age group differences in speech consistency

Age group	Age group	Absolute difference between age groups	p	Cohen d
3;1 to 4;0	4;1 to 5;0	-12.943	.227	.616
	5;1 to 6;0	-22.000	.012	1.344
4;1 to 5;0	5;1 to 6;0	-9.057	.153	.609

Boys show an average speech consistency of 79.3% (SD = 21.00), while girls reach 82.4% (SD = 17.43). Although girls in our study achieved a slightly higher level of speech consistency compared to boys, the difference is not statistically significant ($t = -.629, df = 60, p = .266$).

Children showed an average speech consistency of 81.8% (SD = 19.51) for shorter words (1- and 2-syllable), and 80.1% (SD = 22.86) for longer words (3- and 4-syllable). The difference was not significant ($t = .748, df = 61, p = .229$), with a low effect size ($d = .095$).

Children showed an average speech consistency of 81.5% (SD = 19.22) for words without consonant clusters, and 80.8% (SD = 21.42) for words with consonant clusters. The difference in the average level of consistency between words with and without consonant clusters is not significant ($t = .409, df = 61, p = .342$). The effect size was low ($d = .052$).

The interaction between variability type and age groups was significant ($c^2 = 148.662; df = 2; p < .001$), with the medium effect size ($C = .219$). Post-hoc z-test showed significant differences in consistent incorrect productions between the age groups 3;1-4;0 and 4;1-5;0 ($z = 3.437, p < .001$), with low effect size

($b = .237$) and between the age groups 3;1-4;0 and 5;1-6;0 ($z = 5.212, p < .001$), with low effect size ($b = .330$).

Post-hoc z-test also showed significant differences in consistent correct productions between the age groups 3;1-4;0 and 4;1-5;0, with small effect size ($b = .449$), between the age groups 3;1-4;0 and 5;1-6;0, with medium effect size ($b = .715$), and between the age groups 4;1-5;0 and 5;1-6;0, with small effect size ($b = .266$).

Children produced 70.2% ($f = 205$) variable productions with hits, while 29.8% ($f = 87$) variable-no hits. There was a statistically significant difference in the proportion of variable-with hits versus variable-no hits ($\chi^2 = 47.685; df = 1; p < .001$), with a medium effect size ($\omega = .404$).

Among all errors, the most common was the substitution of /ʃ/, /ʒ/, /tʃ/ for o /s/, /z/, /tʃ/ substitutions (30.1%), followed by the substitution of /r/ with /l/ (17.8%). Palatalization of /ʃ/, /ʒ/, /tʃ/ and /s/, /z/, /tʃ/ was also relatively frequent (10.3%). Less common errors included gliding (9.5%), consonant cluster simplification (7.4%), voicing (5.8%), interdental articulation (2.9%), deletion of unstressed syllables (2.2%), and stopping (1.9%). Only 9.3% of errors were atypical. Atypical errors comprised interdental articulation in combination with other errors, substitution of /ʃ/, /ʒ/, /tʃ/ with /s/, /z/, /tʃ/ substitutions, uvular /r/, substitution of /r/ with a semivowel or /u/, substitution of /u/ with /l/ or /v/, deletion of final vowels or initial consonants, and omission of consonants within words.

4 Discussion

The analysis of speech consistency in 62 typically developing Slovenian children aged 3;3–6;0 years, showed some similarities with previous studies and some unexpected results.

First, the average consistency of 81% across all participants aligns with previous research in typically developing children in the same age range, reporting consistency between 80% and 95% (Burt et al. 1999; Holm et al. 2007, 2023; Martikainen et al. 2020). At the same time, the analysis revealed considerable individual differences in speech consistency, ranging from 28% to 100%. These values can be directly linked to the assessment of inconsistency proposed by Dodd et al. (2005). The authors suggest 40% inconsistency across multiple productions of

25 words as a criterion for diagnosing IPD. In typically developing children, variability is around 11%, while children with speech delay or other consistent speech disorders show about 30%. In our sample, 10 children exceeded 40% variability, which might suggest the presence of IPD. However, a detailed analysis revealed that their variable productions usually included at least one correct production, and most errors were age appropriate. It should be noted that our sample size was small compared to Dodd et al. (2005), and children were not assessed on other language domains—the assessment relied only on parent-reported developmental history. A more direct and detailed assessment could potentially lead to a diagnosis of IPD in some of these children.

Furthermore, our analysis focused on the relationship between speech consistency and age, gender, word length, and complexity. We found a significant correlation with age: older children were significantly more consistent than younger ones. These results replicate previous findings (Holm et al. 2007, 2023; Sosa 2015), showing that speech variability decreases with age. No significant relationship was found between speech consistency and gender, consistent with Burt et al. (1999), although some studies suggest small, transient female advantages in language development (Holm et al. 2007, 2023; Rinaldi et al. 2021).

Contrary to prior findings, we observed no effect of word length or consonant clusters on consistency. This may reflect an older age sample, compared to other studies, since 6-year-old children have largely reached a more stable oromotor control phase, which directly contributes to the consistency in production (Williams and Stackhouse 2000). Another reason for such results can be linguistic. In the speech of English-speaking children, shorter words predominate, while Slovenian includes a higher proportion of multisyllabic words. Slovenian-speaking children potentially have earlier and larger experience with longer and complex words, which may facilitate stronger mental representations of such words even at a very young age.

Speech productions were categorized into consistent correct and incorrect productions and variable productions with and without hits. Most words were produced consistently, more than half without errors. Variable productions with hits were less frequent, and variable productions without hits were rare. These findings align with Holm et al. (2007, 2023), indicating that variable productions typically contain at least one correct production and are not indicative of IPD.

Error analysis revealed that the most common errors were /ʃ/, /ʒ/, /tʃ/ to /s/, /z/, /ʃs/ substitutions, /r/ to /l/ substitutions, palatalization, gliding, cluster simplification, and voicing. These errors occurred mainly in words containing /ʃ/, /ʒ/, /tʃ/, /s/, /z/, /ʃs/, /r/, or clusters including these sounds, consistent with previous studies on Slovenian-speaking children (Marin 2013; Muznik 2012; Ozbič et al. 2015). Most of the errors were, however, age appropriate.

5 Conclusion

Despite individual differences, speech in typically developing Slovenian children is highly consistent. Gender, word length, and consonant clusters did not significantly affect speech consistency, whereas age was associated with both the proportion of consistent speech and the type of variability. Speech consistency increases with age, with a growing proportion of error-free consistent productions and a decreasing proportion of consistent productions with errors. Between ages of 3 and 6 years, children's speech becomes progressively more stable, with most remaining errors reflecting typical developmental patterns. When variable productions occur, they typically alternate between correct realizations and those containing developmental errors. Variability is therefore not prominent in typical speech and declines with age, such that by 6 years, children's speech is nearly fully consistent.

These results contribute to the discussion on variability as a potential indicator of speech disorders. The study highlights the importance of including multiple word repetitions in speech assessment, as patterns of variability provide valuable insights into speech development. Finally, an important outcome of the study is a new tool for evaluating speech consistency, which is not only a valuable contribution for any future studies of speech consistency but can also be used by Slovenian speech and language therapists to gain better insight into the speech production of children.

6 Limitations

This study has several potential limitations. Firstly, the sample was small and unevenly distributed across age groups and genders, limiting generalizability. Secondly, testing took place in a preschool setting, and although audio recordings allowed detailed transcription, the presence of occasional background noise may have affected data quality. Finally, due to time constraints, children's developmen-

tal histories were parent-reported, without targeted assessment of language and speech.

Any future research should attempt to avoid these limitations, extend the age range to younger than 3 and older than 6 years to further explore speech consistency and variability patterns, and investigate the consistency in children with SSD (e.g., articulation disorder, IPD, CAS).

References

- Barbier, Guillaume; Perrier, Pascal; Payan, Yohan; Tiede, Mark K.; Gerber, Silvain; Perkell, Joseph S.; Ménard, Lucie (2020) "What anticipatory coarticulation in children tells us about speech motor control maturity." *PLOS ONE* 15 (4). Retrieved from <https://doi.org/10.1371/journal.pone.0231484>
- Boersma, Paul; Weenink, David (2024) Praat: doing phonetics by computer [Computer program]. Version 6.4.44, retrieved 25 September 2025 from <https://praat.org>
- Bornstein, Marc H.; Hahn, Chun-Shin; Haynes, O. Maurice (2004) "Specific and general language performance across early childhood: Stability and gender considerations." *First Language* 24 (3): 267–304. Retrieved from <https://doi.org/10.1177/0142723704045681>
- Burt, Lucy; Holm, Alison; Dodd, Barbara (1999) "Phonological awareness skills of 4-year-old British children: An assessment and developmental data." *International Journal of Language and Communication Disorders* 34 (3): 311–335. Retrieved from <https://doi.org/10.1080/136828299247432>
- Dodd, Barbara; Holm, Alison; Crosbie, Sharon; McIntosh, Barbara (2005) "Differential diagnosis of phonological disorders." In *Differential Diagnosis and Treatment of Children with Speech Disorder*, edited by Dodd, Barbara, 63–91. London: Whurr.
- Dodd, Barbara; McIntosh, Barbara; Crosbie, Sharon; Holm, Alison (2024) "Diagnosing inconsistent phonological disorder." *International Journal of Language and Communication Disorders*. Advance online publication. Retrieved from <https://doi.org/10.1080/02699206.2023.2224916>
- Ferguson, Charles Albert; Farwell, Carol B. (1975) "Words and sounds in early language acquisition." *Language* 50 (2): 419–439. Retrieved from <https://doi.org/10.2307/412864>
- Globačnik, Bojana (1999) *Ocena artikulacije govora*. Ljubljana: Centerkontura.
- Green, Jordan Richard; Moore, Christopher Alan; Higashikawa, Midori; Steeve, Roger William (2000) "The physiologic development of speech motor control: Lip and jaw coordination." *Journal of Speech, Language, and Hearing Research* 43 (1): 239–255. Retrieved from <https://doi.org/10.1044/jslhr.4301.239>

- Grobler, Maria (1985) "Govorni razvoj, razvojne težave in govorne motnje." *Obzornik Zdravstvene Nege* 19 (3/4): 190–197. Retrieved from <https://obzornik.zbornica.zveza.si/index.php/ObzorZdravNeg/article/view/1666>
- Holm, Alison; Crosbie, Sharon; Dodd, Barbara (2005) "Treating inconsistent speech disorders." In *Differential Diagnosis and Treatment of Children with Speech Disorder*, edited by Dodd, Barbara, 213–234. London: Whurr.
- Holm, Alison; Crosbie, Sharon; Dodd, Barbara (2007) "Differentiating normal variability from inconsistency in children's speech: Normative data." *International Journal of Language and Communication Disorders* 42 (4): 467–486. Retrieved from <https://doi.org/10.1080/13682820600988967>
- Holm, Alison; van Reyk, Olivia; Crosbie, Sharon; De Bono, Stephanie; Morgan, Angela; Dodd, Barbara (2023) "Preschool children's consistency of word production." *Clinical Linguistics and Phonetics* 37 (3): 223–241. Retrieved from <https://doi.org/10.1080/02699206.2022.2041099>
- Iuzzini Seigel, Jennifer; Hogan, Tiffany P.; Green, Jordan Richard (2017) "Speech inconsistency in children with childhood apraxia of speech, language impairment, and speech delay: Depends on the stimuli." *Journal of Speech, Language, and Hearing Research* 60 (5): 1194–1210. Retrieved from https://doi.org/10.1044/2017_JSLHR-S-21-00547
- Jones, Sarah D. (2020) "Accuracy and variability in early spontaneous word production: The effects of age, frequency and neighbourhood density." *First Language* 40 (2): 128–150. Retrieved from <https://doi.org/10.1177/0142723719894768>
- Macrae, Tanya (2013) "Lexical and child-related factors in word variability and accuracy in infants." *Clinical Linguistics and Phonetics* 27 (6–7): 497–507. Retrieved from <https://doi.org/10.3109/02699206.2012.752867>
- Marin, Alja (2013) *Fonološki (govorni) razvoj otrok med 2;5 in 5;7 letom starosti: Transkripcija govora*. Ljubljana: Univerza v Ljubljani, Pedagoška fakulteta. Retrieved from <https://repozitorij.uni-lj.si/IzpisGradiva.php?lang=slv&cid=27558>
- Martikainen, Anna-Leena; Savinainen-Makkonen, Tuula; Kunnari, Sari (2020) "Speech inconsistency and its association with speech production, phonological awareness and nonword repetition skills." *Clinical Linguistics and Phonetics* 35 (8): 743–760. Retrieved from <https://doi.org/10.1080/02699206.2020.1827296>
- McLeod, Sharynne; Hewett, Sarah R. (2008) "Variability in the production of words containing consonant clusters by typical 2- and 3-year-old children." *Folia Phoniatrica et Logopaedica* 60 (4): 163–172. Retrieved from <https://doi.org/10.1159/000127835>
- McNeill, Brigid C.; Gillon, Gail T.; Dodd, Barbara (2022) "Predictors of speech severity and inconsistency over time in children with token-to-token inconsistency." *Journal of*

- Speech, Language, and Hearing Research* 65 (1): 161–176. Retrieved from https://doi.org/10.1044/2021_JSLHR-21-00611
- Muznik, Mojca (2012) *Fonološki razvoj otrok med 3. in 7. letom starosti (transkripcija govora)*. Ljubljana: Univerza v Ljubljani, Pedagoška fakulteta. Retrieved from http://pefprints.pef.uni-lj.si/1287/1/diploma_2.pdf
- Ozbič, Martina; Kogovšek, Damjana; Novšak Brce, Jerneja; Muznik, Maja; Stemberger, Joseph Paul; Bernhardt, Barbara May (2015) “Razvoj sičnikov, šumnikov in zlitnikov pri slovenskih predšolskih otrocih.” In *Slovnica in slovar – aktualni jezikovni opis: Del 2*, 543–552. Ljubljana: Univerza v Ljubljani. Retrieved from <https://repozitorij.uni-lj.si/IzpisGradiva.php?lang=slv&id=80117>
- Ozbič, Martina; Kogovšek, Damjana; Košir, Simona; Stemberger, Joseph Paul; Bernhardt, Barbara May (2020) *Presejalni preskus 50 besed instrumenta za ocenjevanje fonološkega razvoja v slovenščini, 1. del*. Phonological Development Tools and Cross-linguistic Phonology Project. Retrieved from https://phonodevelopment.sites.olt.ubc.ca/slovenscina_preskus-za-ocenjevanje-fonoloskega-razvoja_slovenian-phonology-screener_guide-analyses_ozbic-et-al_2020/
- Ozbič, Martina; Kogovšek, Damjana; Košir, Simona; Stemberger, Joseph Paul; Bernhardt, Barbara May (2023) *Instrument za ocenjevanje fonološkega razvoja v slovenščini, 2. del*. Phonological Development Tools and Cross-linguistic Phonology Project. Retrieved from https://phonodevelopment.sites.olt.ubc.ca/slovenscina_instrument-za-ocenjevanje-fonoloskega-razvoja-_2del_ozbic_2021_slovene_phonology_test_part-2_instructions_forms-2/
- Rinaldi, Pasquale; Pasqualetti, Paolo; Volterra, Virginia; Caselli, Maria Cristina (2021) “Gender differences in early stages of language development: Some evidence and possible explanations.” *Journal of Neuroscience Research* 101 (5): 643–653. Retrieved from <https://doi.org/10.1002/jnr.24914>
- Smith, Anne (2006) “Speech motor development: Integrating muscles, movements, and linguistic units.” *Journal of Communication Disorders* 39 (5): 331–349. Retrieved from <https://doi.org/10.1016/j.jcomdis.2006.06.017>
- Smith, Anne; Goffman, Lisa (1998) “Stability and patterning of speech movement sequences in children and adults.” *Journal of Speech, Language, and Hearing Research* 41 (1): 18–30. Retrieved from <https://doi.org/10.1044/jslhr.4101.18>
- Sosa, Anna V. (2015) “Intraword variability in typical speech development.” *American Journal of Speech-Language Pathology* 24 (1): 24–35. Retrieved from https://doi.org/10.1044/2014_AJSLP-13-0148

- Sosa, Anna V.; Stoel-Gammon, Carol (2006) "Patterns of intra-word phonological variability during the second year of life." *Journal of Child Language* 33 (1): 31–50. Retrieved from <https://doi.org/10.1017/S0305000905007166>
- Sosa, Anna V.; Stoel-Gammon, Carol (2012) "Lexical and phonological effects in early word production." *Journal of Speech, Language, and Hearing Research* 55 (2): 596–608. Retrieved from [https://doi.org/10.1044/1092-4388\(2011/10-0113\)](https://doi.org/10.1044/1092-4388(2011/10-0113))
- Williams, Peter; Stackhouse, Joy (2000) "Rate, accuracy and consistency in diadochokinetic performance of young normally developing children." *Clinical Linguistics and Phonetics* 14 (4): 267–293. Retrieved from <https://doi.org/10.1080/02699200050051096>

Varijabilnost i nedosljednost u govoru tipično razvijene djece

Sažetak

Nedosljednost u govoru često se navodi kao pokazatelj poremećaja izgovora te kao ključni kriterij u razlikovanju različitih podtipova. Ipak, istraživanja su pokazala da je varijabilnost prisutna, pa čak i očekivana, u tipičnom razvoju govora te da nije nasumična, već se može objasniti različitim čimbenicima. Ovo istraživanje opisuje govornu dosljednost kod 62 tipično razvijene slovenske djece u dobi od 3 do 6 godina te ispituje utjecaj dobi, spola, duljine i složenosti riječi. Konstruiran je prvi slovenski test govorne dosljednosti za djecu, koji uključuje tri ponavljanja 25 riječi u zadatku imenovanja slika. Ukupna prosječna govorna dosljednost iznosila je 81 %, uz statistički značajno poboljšanje s dobi. Dob je imala značajan učinak na tipove varijabilnosti: mlađa djeca češće su pokazivala dosljedne netočne produkcije, dok je udio točnih dosljednih produkcija rastao s dobi. Gotovo svi varijabilni odgovori sadržavali su barem jednu točnu realizaciju ciljne riječi. Nije utvrđena statistički značajna povezanost između govorne dosljednosti i spola, duljine riječi niti prisutnosti suglasničkih skupova. Dobiveni rezultati pružaju vrijedan doprinos razumijevanju tipičnog razvoja govora te nude uvid u vrste varijabilnosti koje se i dalje smatraju tipičnima.

Ključne riječi: dosljednost; varijabilnost; govor; tipičan razvoj; logopedska terapija.