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## Realization of the Phonemic-Syllabic Structure of Words in the Speech of Children with Intellectual Disability

### SUMMARY

Problems in the realization of the phonemic structure of the word (the composition and arrangements of phonemes) examined in relation to the syllabic structure of the word are presented in this article based on the example of the phenomena in the articulation of four children with moderate intellectual disability, aged 8–11 (two with cerebral palsy (CP) and two with Down syndrome). All children were diagnosed with oligophasia, three of them with dysglossia co-occurring with dysphagia, and the CP children – with dysarthria as well. In the articulation of the studied children there were paradigmatic disorders (in the form of distortion and substitution of phonemes) accompanied by syntagmatic disorders: changes in the word structure consisting in quantitative distortions (first of all reductions of the word structure resulting from the reduction of single phonemes and phoneme groups, the most frequent of the recorded phenomena being the simplification of consonant groups) and in qualitative distortions (mainly in the form of phoneme assimilation); a relatively large group consisted of words whose structure was considerably transformed as a result of the so-called combined changes.

**Key words:** phonemic structure of the word, syllabic structure of the word, paradigmatic disorders, syntagmatic disorders, cerebral palsy, Down syndrome

### INTRODUCTION

The term “phonemic-syllabic structure of the word” used in this study refers to the terms presented by J.T. Kania (1982, p. 16) in the guidelines of the linguistic classification of speech disorders: “The structure of the word should be

understood in broad terms. It covers the syllabic structure, phonemic and sound structure, as well as the structure of phonemic and sound connections. Disorders can be analyzed at the syllable level or at the phoneme and sound level” – because the subject of our analysis is the realization of the phonemic structure of words (in the most general terms: the composition and arrangement of phonemes that make up a word), analyzed in relation to their syllabic structure, the term “phonemic-syllabic structure of the word” renders the essence of the subject of investigation. According to S. Milewski (2013, p. 636), who cites the findings of Russian scholars, the term “syllabic structure of the word”, in its narrow sense, may denote only the number of syllables in the word, but in the wider sense it refers not only to the syllabic length of the word but also to the types of syllables that make it up and to their linear sequence. In our studies presented here we refer to the structure of words in the other sense.

The problems concerning the phonetic-phonological aspects of word structure have been discussed in Polish logopedic literature for many years, both in the context of language development without dysfunctions and in speech pathology; however, it is difficult to regard the research in this areas as fully satisfactory: there are still many questions not yet described and explained, while the phenomena recorded in single cases and tendencies observed in small groups require verification in larger populations, using research procedures involving the checking of a number of essential variables. Although the syllable is perceived as an extremely important unit in the process of language acquisition by the child, both in the aspect of reception and sending (production),<sup>1</sup> this has not, regrettably, resulted in the expected research activity of Polish logopedists. We should fully agree with the position of Milewski (2013, p. 637), who points out significant gaps in the state of research, for example, the lack of data on the chronology of acquiring the syllabic structure of the word, taking the degree of difficulty of its various types into account. Fragmentary knowledge in this area frequently impedes the categorization of the phenomena observable in the realization of the word structure (i.e. recognizing them as normative or as a pathological symptom) and often prevents adequate interpretation of them in cases of speech disorders, as well comparative analysis.

Certain developmental tendencies in the realization of the phonetic structure of the word at the kindergarten age (3–7 years) have been shown by A. Sołtys-Chmie-

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<sup>1</sup> K. Krakowiak (1995, p. 36) regards syllables as rhythmic-melodic and motor-perceptual units of the stream of speech, containing “all factors of the tonal differentiation of sounds, both on the phonetic and prosodic levels”. P. Łobacz (1996; 2005), when reporting the world research into the child’s phonological development, cites conceptions that emphasize the role of syllables, particularly in the initial stage of speech development – from babbling (based on homonymic repetitions of nuclear syllables with a CV structure; C – consonant, V – vowel), to first verbal behavior (with the prevalence of words with a CVCV structure, based on reduplication of the CV syllable), to the categorization of words made by three-year-olds on the basis the syllabic structure.

lowicz (1998), based on large-scale studies on articulation, which she conducted in a group of 1,063 Polish-speaking subjects. In her analysis, the author used the conceptual apparatus proposed by Kania (1982), concerning disorders at the segmental level, covering paradigmatic disorders (those affecting the phoneme/sound inventory) and syntagmatic disorders (affecting the phonemic/sound structure of the word);<sup>2</sup> since the main goal of the studies was to investigate developmental changes within the sound inventory, the selection of the language material used in the questionnaire was made from the perspective of assessing the articulation of sounds: this fact indisputably influenced the range of changes observed in the structure of the word. Especially invaluable in Sołtys-Chmielowicz's study, from the angle of the phonetic structure of the word, is the description and interpretation of phenomena whose exemplification is related every time to the child's age. The limitations in the use of the findings made by Sołtys-Chmielowicz in comparative analyses are caused by the lack of quantitative data (the frequency of occurrence of specific phenomena in the empirical material, the percentage of children in whose articulation there are syntagmatic disorders, etc.), as well as by the lack of information on possible developmental deficits in the children of the studied population (the only criterion for qualification into the group was the child's participation in kindergarten activities).

The largest amount of data on disorders of the phonemic-syllabic structure of the word in the units of speech pathology diagnosed in children concerns specific disorders in speech and language development: relevant data can be found in studies devoted to speech underdevelopment of aphasic, alalia, or alalia prolongata types, or to specific language impairments (SLI), child aphasia (e.g. Kordyl, 1969; Parol, 1989; Stasiak, 2007; Czaplewska, 2015) as well as studies on the speech of hearing-impaired patients (e.g. Lorenc, 2012; Muzyka-Furtak, 2012). Information on the distortions of the phonological-phonetic structure of words seldom appear in Polish publications; it is usually provided as an element of the characteristics of speech in persons with mental retardation and is confined to general statements, e.g. "there are frequent [...] metatheses, shortening of words, simplifications in consonant groups" (Poniatowska, 1993, p. 64), "children with Down syndrome, despite the delayed speech development, are able to utter in isolation the majority of sounds found in Polish, however, when they combine them in longer words or sentences, they tend to omit some of them and combine them into indistinct

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<sup>2</sup> Among paradigmatic disorders, Kania (1982) distinguished elision, distortion and substitution of phonemes/sounds, and among syntagmatic ones – primary disorders and secondary disorders; primary syntagmatic disorders embrace quantitative distortions (diminishment of the word structure consisting in the reduction of phonemes/phoneme groups, and enriching of the word structure through introduction of phonemes/phoneme groups – epenthesis, insertion), qualitative distortions (assimilation and dissimilation), changes in the linear order of phonemes and syllables in the word (metatheses), combined changes, non-systemic distortions; secondary syntagmatic distortions are a consequence of paradigmatic changes.

clusters” (Jęczeń, 2015, p. 97). The realization of the phonemic-syllabic structure of words was one of the aspects of the studies by U. Mirecka (2013b; 2013c), devoted to disorders of the phonic substance of utterances of dysarthric patients with cerebral palsy (CP), which were conducted between 2010 and 2012 in a 36-subject group, half of whom were children with (mild and moderate) intellectual disability, aged 6–15. Syntagmatic disorders were also taken into consideration in the analysis of the phenomena observed by E. Szczyпка (2017) in the speech of five children with Down syndrome, aged 5–10, with reference to the level of language development of the subjects as well as their communication skills.

We want to present the complex problems in the realization of the phonemic-syllabic structure of the word in the speech of children with intellectual disability using the example of children with cerebral palsy and Down syndrome, covered by the logopedic diagnosis procedure, who were diagnosed with moderate mental retardation.<sup>3</sup>

## REALIZATION OF THE PHONEMIC-SYLLABIC STRUCTURE OF THE WORD IN CASES OF CEREBRAL PALSY AND DOWN SYNDROME IN CHILDREN WITH MODERATE INTELLECTUAL DISABILITY

The analyzed empirical material was collected in the course of the above-mentioned studies on children with CP, conducted by Mirecka (2013b; 2013c) and studies on children with Down syndrome, conducted by Szczyпка (2017). For presentation in this article, we chose four children aged 8–11 (two with CP and two with Down syndrome) from the studied groups – all of them were diagnosed with oligophasia,<sup>4</sup> three with dysglossia<sup>5</sup> co-occurring with dysphagia (swallow-

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<sup>3</sup> The term “intellectual disability” is used here in accordance with the DSM-5 classification in which this type of disability is included in the group of neurodevelopmental disorders (Gałecki, Święcicki, 2015). The term “mental retardation” is used in accordance with the ICD-10 classification (Pużyński, Wciórka, 2000).

<sup>4</sup> We understand oligophasia as a speech disorder, its essence being the problem with acquisition of the language system and the rules of language use, that makes it difficult or even impossible both to produce and understand utterances; the causes of oligophasia are first of all global cognitive deficits with varied degrees of severity, found in people with intellectual disability. We believe that the determinants of oligophasia are not only of biological character indicated by the authors of speech disorders classification (see: Styczek, 1980; Grabias, 2000); when seeking the origin of mental retardation (impairment), after M. Kościelska (1998), not only in biological but also in social and psychological factors and in their mutual interactions, we notice among the determinants of oligophasia also environmental causes whose essence can be reduced to the quality of the subject’s relations with the social environment.

<sup>5</sup> We understand dysglossia as a speech disorder consisting in the incorrect realization of, and in extreme cases, in failure to produce phonemes and their connections, determined by anatomical

ing disorders), and the CP children – also with dysarthria.<sup>6</sup> Apart from the results of the above-mentioned techniques, the diagnosis also took into account the data from observation of the children's language behaviors (especially their interaction skills, dialogue skills, and social language skills), the assessment of the anatomical and functional condition of their speech apparatus, assessment of phonemic hearing,<sup>7</sup> as well as information from the analysis of the available medical, rehabilitation, psychological, pedagogical and logopedic documentation.

The analysis of speech of the studied children utilized Kania's (1982) typology and terminology of paradigmatic and syntagmatic disorders. The analyzed words (presented in orthographic and phonological notation<sup>8</sup> in the text) were taken from the corpus of utterances obtained using diverse diagnostic techniques: in the case of children with CP, they were free (dialogic and narrative) utterances as well as words and sentences they repeated when tested with the *Dysarthria Scale* (Mirecka, Gustaw, 2006), and in the case of children with Down syndrome,

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anomalies within the articulatory apparatus. S. Grabias (2000) places dysglossia among disorders related to the lack or dysfunction of realization skills; apart from abnormalities of the structure of speech organs, I. Styczek (1980) also points to hearing loss as a cause of dysglossia.

<sup>6</sup> "Dysarthria is a disorder at the executive level of the motor mechanism of speech, caused by injuries to the central or peripheral nervous system (the upper and lower motor neuron, the extrapyramidal system, and the cerebellum) manifested in dysfunctions within the respiratory, phonatory and articulatory apparatus, resulting in distortions of the phonic substance of utterances at the segmental level (realization of phonemes and of word structure) and on the suprasegmental plane (prosodic organization of the phonic sequence regarding intonation, stress, speech rate and rhythm, phrasing, and resonance and voice quality). Dysarthric disorders have a different range and intensity – in extreme cases they consist in the inability to produce speech sounds" (Mirecka, 2015, p. 844).

<sup>7</sup> In the studies, an experimental phonemic hearing test was used, consisting in the auditory differentiation of word pairs; it involved 40 word pairs divided into the following groups: 1) words differing in one phoneme (with elementary phonological oppositions, and differentiated by a large number of features, e.g. /kačka/ : /kaška/, /tečka/ : /tyčka/, /buty/ : /nuty/) – 28 word pairs, 2) words with a differentiated number of phonemes (differing in one segment, e.g. /listek/ : /lisek/) – 7 word pairs, 3) words with an altered sequence of phonemes (words with an altered sequence of two adjacent phonemes and words with an altered sequence of a greater number of phonemes occupying more distant positions from one another in the word structure, e.g. /palma/ : /plama/, /mata/ : /tama/) – 5 word pairs (see: Mirecka, 2012; 2013b).

<sup>8</sup> The article adopted the phonological system as proposed by B. Rocławski (2001), consisting of 36 phonemes: 8 vowel phonemes: /i/, /y/, /e/, /a/, /o/, /u/, /ɛ/, /ɔ/ and 28 consonantal phonemes: /j/, /ɥ/, /r/, /l/, /m/, /n/, /ń/, /f/, /v/, /s/, /z/, /š/, /ž/, /ś/, /ź/, /x/, /c/, /ʒ/, /ć/, /ź/, /č/, /ʒ/, /p/, /b/, /t/, /d/, /k/, /g/. The phonological notation, given in slashes, used the characters of the Slavonic alphabet – the following rules proposed by S. Milewski (2005, p. 15) were followed: "take into account the phonemes /ɛ/ and /ɔ/ exclusively before fricative consonants /f, v, s, z, š, ž, ś, ź, x/ and /ɔ/ in final positions in words; treat the final /ɛ/ as a variant the /e/ phoneme; notation of /ɛ, ɔ/ in the position before velar consonants /k, g/ as a combination of the corresponding oral vowels and the phoneme /n/; the adoption of the phoneme groups /pi/, /bi/, /mi/, /fi/, /vi/ and /ki/, /gi/ in the place of occurrence of the so-called soft labial and velar consonants in the prevocalic position except before /i/".

these were words referring to the designata presented in the authorial pictorial questionnaire for articulation assessment (Szczyńska, 2017) and in the *Language Development Test* (Smoczyńska et al., 2015), as well as the sentences repeated after the testing person and produced by the children on their own. The analysis took 480 words (120 from the corpus of each child's utterances) into consideration.

Below will be presented the most important information, in the context of the problems discussed here, that concerns individual subjects (their names have been changed), which will be followed by the data on the realization of the phonemic-syllabic structure of words. The knowledge of paradigmatic disorders occurring in the speech of individual subjects (first of all, substitutions) is essential for interpreting changes in the structure of the words they uttered: this applies, firstly, to the recognition of a change as a paradigmatic/syntagmatic disorder, and then to the determination of the kind of syntagmatic disorder (e.g. primary/secondary disorder, assimilation type).

**Maja** – a girl aged 9 years and 9 months, with a neurological diagnosis of cerebral palsy (spastic diplegia), with a psychological diagnosis of moderate mental retardation; a first-form pupil of special primary school. In logopedic examination, moderate spastic dysarthria (manifested in disorders both at the segmental and suprasegmental level of utterance), oligophasia, as well as dysphagia were found. She was the only child in the studied group who was unable (due to serious problems with attention concentration and with understanding the task) to take part in the experimental phonemic hearing tests. In the girl's articulation, numerous and intensified paradigmatic and syntagmatic disorders were found. Among paradigmatic disorders the following were recorded:

- distortions: /s/, /ś/ – lateral, no dentalization; /t/, /n/, /l/ – interdental; /f/ – bilabial;
- substitutions: /š/, /ž/, /č/, /ž/, /z/, /c/, /z/ → /s/ lateral; /ž/, /č/, /ž/ → /ś/ lateral; /b/ → /p/; /v/ → /f/ bilabial; /d/, /g/, /k/ → /t/ interdental; /ń/ → /n/ interdental; /r/ → /l/ interdental; /ę/ → /e/; /o/ → /o/.

**Marek** – a boy aged 11 years and 11 months, with a neurological diagnosis of cerebral palsy (quadriplegia), with a psychological diagnosis of moderate mental retardation; a third-form pupil of special school (one-to-one tuition). Logopedic examination showed moderate spastic-kinetic dysarthria (with prevailing disorders at the suprasegmental level of utterance), oligophasia, dysglossia (conditioned by malocclusion – distocclusion), as well as dysphagia. He performed the experimental phonemic hearing tests correctly. Moderate intensified paradigmatic disorders and rare syntagmatic disorders were found in the boy's articulation. Among paradigmatic disorders the following were recorded:

- distortions: /s/, /z/, /c/, /z/ – labiodental; /ś/, /ž/, /č/, /ž/ – no dentalization, incomplete (weakened) softness; /l/ – interdental; /p/, /b/, /m/ frequently labiodental;

- substitutions: /š/→/s/ labiodental; /ž/→/z/ labiodental; /č/→/c/ labiodental; /ž/→/z/ labiodental; /r/→/l/ interdental.

**Daria** – a girl aged 8 years and 8 months, with a medical diagnosis of Down syndrome, with a psychological diagnosis of moderate mental retardation; a first-form pupil of special primary school. Logopedic examination showed oligophasia, dysglossia (determined by the anatomical-functional abnormalities of the articulatory apparatus), and dysphagia. She performed the experimental phonemic hearing tests correctly. Many intensified paradigmatic and syntagmatic disorders were found in the girl's articulation. Among paradigmatic disorders the following were recorded:

- distortions: /t/, /d/, /n/, /l/, /s/, /z/, /č/, /ž/ – interdental;
- substitutions: /š/, /s/→/s/ interdental; /ž/, /z/→/z/ interdental; /č/, /c/→/c/ interdental; /ž/, /z/→/ž/ interdental; /r/→/i/, /l/ interdental; /q/→/o/; /e/→/e/; unstable articulation /g/, /k/ – more often: /g/→/d/, /k/→/t/, less often – correct realization.

**Dawid** – a boy aged 10 years and 4 months, with a medical diagnosis of Down syndrome, with a psychological diagnosis of moderate mental retardation; a first-form pupil of special primary school. Logopedic examination showed oligophasia, dysglossia (determined by the anatomical-functional abnormalities of the articulatory apparatus), as well as dysphagia. He performed the experimental phonemic hearing tests correctly. Moderately intensified paradigmatic disorders and intense syntagmatic disorders were found in the boy's articulation. Among paradigmatic disorders the following were recorded:

- distortions: /r/ – palatal; /š/, /ž/, /č/, /ž/, /n/ – interdental;
- substitutions: /š/, /s/→/s/ interdental (/s/ occurs sporadically); /ž/, /z/→/ž/ interdental (/z/ occurs sporadically); /č/, /c/→/c/, /s/ interdental; /ž/, /z/→/ž/ interdental; /q/→/o/; /e/→/e/.

The paradigmatic disorders – in the form of distortions and substitutions – found in the studied children reduced the phoneme inventory of the individual subjects to a different degree: the greatest problems in this respect were reported in Maja (19 substituted phonemes, 6 distorted), then in Daria (11 substituted phonemes, 8 distorted), in Dawid (10 substituted and 6 distorted phonemes) and in Marek (10 distorted phonemes, 4 substituted); it should be stressed that the substitutions of consonant phonemes were distorted sounds.

The foregoing paradigmatic disorders were accompanied by changes in the word structure, i.e. syntagmatic – primary or secondary – disorders. The primary syntagmatic disorders covered almost all their kinds specified in Kania's classification – they occurred with varying intensity, both in the studied group and in individual children.



Quantitative distortions consisted first of all in the diminishment of the word structure as a result of reduction (omission) of single phonemes<sup>9</sup> and – less often – phoneme groups (including syllables); the enriching of word structure was reported only sporadically.

The most frequent of the reported phenomena was phoneme reduction within consonant groups, i.e. the simplification of consonant groups.<sup>10</sup> Simplification embraced initial-, medial- and final-position groups found in words with a different syllable structure. The collected material contained first of all two-phoneme consonant groups, whereas three-phoneme groups were found in barely several words. Here are the examples of recorded words in which the only type of syntagmatic abnormality was consonant group simplification (at the same time – syllable structure simplification):<sup>11</sup>

- simplification of consonant groups in one-syllable
  - CCVC→CVC
  - /klej/→/tej/ ‘klej’ *glue* \*/t/→/t/ (substitution /k/→/t/) [Maja]
  - CCCVC→CVC
  - /struś/→/luś/ ‘struś’ *ostrich* \*/st/→/l/ (substitution /r/→/l/) [Daria]
  - CVCC→CVC
  - /żuuf/→/żuf/ ‘żółw’ *turtle* /-u/→/-f/ (substitution /ż/→/ż/) [Daria]
- simplification of consonant groups in two-syllable words
  - CCV-CV→CV-CV
  - /sfoje/→/soje/ ‘swoje’ *one’s* /sf-/→/s-/ [Maja]
  - /stuka/→/tuka/ ‘stuka’ *knocks* /st-/→/t-/ [Dawid]
  - /ścany/→/ćany/ ‘ściany’ *walls* /śc-/→/ć-/ [Daria]
  - CCV-CVC→CV-CVC
  - /piesek/→/pešek/ ‘piesek’ *doggie* /pi-/→/p-/ (substitution /s/→/ś/) [Dawid]

<sup>9</sup> Reduction of phonemes, as a syntagmatic phenomenon, should be distinguished from elision – a paradigmatic disorder.

<sup>10</sup> In logopedic literature (e.g. Sołtys-Chmielowicz, 2008) the term “simplification of a consonant group” is interchangeably used with the term “reduction of a consonant group”. In the present article, we use the following synonymous terms: “simplification of a consonant group” and “reduction of phoneme/phonemes within a consonant group” because the term “reduction of a consonant group” might be also construed as the omission of a whole consonant group.

<sup>11</sup> For each of the examples, we first provide the normative structure of the word, and after the arrow, the realized structure. A hyphen in the notation of the syllabic structure of the word separates syllables, and placed after a phoneme/group of phonemes between slashes denotes the initial position, placed before a phoneme/group of phonemes – final position, and on either side – the medial position. An asterisk (\*) before the notation in slashes denotes a hypothetical realization – anticipated because of substitutions found in the child (only substitutions are noted in the parentheses as they are regarded as disorders that directly impact the phonemic structure of the word). Single quotes (‘’) are used to present the word in the orthographic notation in Polish and italics is used to present the meaning of the word in English. Square brackets contain the name of child whose utterance is cited.



- zvonek/→/sonet/ ‘dzwonek’ *bell* \*/sf-/→/s/ (substitution /z/→/s/, /v/→/f/)  
[Maja]  
CCV-CCVC→CV-CVC  
/xɔpɨec/→/xopes/ ‘chłopiec’ *boy* /xɔ-/→/x-/ , /-pɨ-/→/-p-/ (substitution  
/c/→/s/) [Maja]  
CV-CCVC→CV-CVC  
/namɨot/→/najt/ ‘namiot’ *tent* /-mɨ-/→/-j-/ [Daria]  
/namɨot/→/namot/ ‘namiot’ *tent* /-mɨ-/→/-m-/ [Dawid]  
CVC-CV→CV-CV  
/pɨɨka/→/pita/ ‘piłka’ *ball* \*/-ɨt-/→/-t-/ (substitution /k/→/t/) [Daria]  
/jajko/→/jato/ ‘jajko’ *egg* \*/-jɨt-/→/-t-/ (substitution /k/→/t/) [Maja]  
/jeźzi/→/ježi/ ‘jeździ’ *rides* /-źz-/→/-ż-/ [Marek]  
CCVC-CV→CV-CV  
/mɨasto/→/maso/ ‘miasto’ *city* /mɨ-/→/m-/ , /-st-/→/-s-/ [Maja]  
CCVC-CV→CVC-CV  
/spodnie/→/podnie/ ‘spodnie’ *trousers* \*/śp-/→/p-/ (substitution /s/→/ś/)  
[Daria]  
CVC-CVC→CV-CVC  
/baɨvan/→/bavan/ ‘bałwan’ *snowman* /-ɨv-/→/-v-/ [Marek], [Daria],  
[Dawid]  
/maɨpa/→/mapa/ ‘małpa’ *monkey* /-ɨp-/→/-p-/ [Daria]  
/ponton/→/poton/ ‘ponton’ *pontoon* /-nt-/→/-t-/ [Dawid]  
CVCC-CV→CVC-CV  
/maɨpka/→/mapka/ ‘małpka’ *monkey* /-ɨpk-/→/-pk-/ [Marek]  
/lampka/→/lamka/ ‘lampka’ *lamp* /-mpk-/→/-mk-/ [Marek]  
/lampka/→/lapka/ ‘lampka’ *lamp* /-mpk-/→/-pk-/ [Dawid]  
➤ simplification of consonant groups in three-syllable words  
VC-CV-CVC→V-CV-CVC  
/aɨtobus/→/atopus/ ‘autobus’ *bus* /-ɨt-/→/-t-/ (substitution /b/→/p/)  
[Maja]  
CV-CCV-CV→CV-CV-CV  
/kobɨeta/→/topeta/ ‘kobieta’ *woman* \*/-pɨ-/→/-p-/ (substitutions /b/→/p/,  
/k/→/t/) [Maja]  
CV-CCVC-CV→CV-CV-CV  
/jabɨuška/→/jabuska/ ‘jabłuszka’ *apples* /-bɨ-/→/-b-/ , \*/-sk-/→/-s-/  
(substitution /ś/→/s/) [Marek]  
CCVC-CV-CV→CCV-CV-CV  
/kɨɨbasa/→/kɨebaśa/ ‘kielbasa’ *sausage* /-ɨb-/→/-b-/ [Daria]  
CCVC-CVC-CV→CVC-CVC-CV  
/zieźżałna/→/jeźżałna/ ‘zjeżdżalnia’ *slide* \*/żɨ-/→/jɨ-/ (substitution  
/z/→/ż/) [Daria]

CCV-CVC-CV→CV-CV-CV

/piɛ̃nɔ̃zɛ/→/penɔ̃zɛ/ ‘pieniądze’ *money* /pĩ-/→/p-/ , /-ns-/→/-s-/  
(substitutions /z/→/s/ , /ń/→/n/; group /nʒ/→/ns/) [Maja]

CVC-CVC-CV→CV-CVC-CV

/xuʂtafka/→/xuʂafka/ ‘huśtawka’ *seesaw* /-ʂt-/→/-ʂ-/ [Daria]

CCV-CCVC-CV→CCV-CCV-CV

/vʲɛvʲurka/→/vʲɛvʲuta/ ‘wiewiórka’ *squirrel* \*/-lt-/→/-t-/ , \*/-i̇t-/→/-t-/  
(substitutions /r/→/l/ , /i̇/ , /k/→/t/) [Daria]

CCV-CCVC-CV→CV-CVC-CV

/bʲɛdronka/→/pelɔ̃nta/ ‘biedronka’ *ladybird* \*/-pʲi-/→/-p-/ , \*/-tl-/→/-l-/  
(substitutions /d/→/t/ , /r/→/l/ , /k/→/t/) [Maja]

- simplification of consonant groups in four-syllable words

V-CV-CVC-CV→V-CV-CV-CV

/okularki/→/okulaki/ ‘okularki’ *glasses* /-rk-/→/-k-/ [Dawid].

Far less often than the simplification of consonant groups, the phenomenon of the reduction of single phonemes occurred: more frequently final phonemes than initial ones; here are the examples:

- reductions of initial phonemes

CV-CV→V-CV

/vɔ̃da/→/ɔ̃ta/ ‘woda’ *water* (substitution /d/→/t/) [Maja]

CV-CV-CV→V-CV-CV

/gʲitara/→/ytala/ ‘gitara’ *guitar* (substitutions /i/→/y/ , /r/→/l/) [Maja]

CV-CV-CVC→V-CV-CVC

/muxɔ̃mor/→/uxɔ̃mol/ ‘muchomor’ *toadstool* (substitution /r/→/l/)  
[Daria]

- reductions of final phonemes

CCVC→CCV

/stuu/→/štu/ ‘stół’ *table* (substitution /s/→/ʂ/) [Daria]

CV-CVC→CV-CV

/komin/→/komi/ ‘komin’ *chimney* [Dawid]

CCV-CVC→CCV-CV

/zgubiɯ/→/zgubi/ ‘zgubił’ *lost* [Marek]

CV-CV-CVC→CV-CV-CV

/samoxut/→/samoxu/ ‘samochód’ *car* [Marek]

CV-CV-CV-CVC→CV-CV-CV-CV

/xipopotam/→/xypopota/ ‘hipopotam’ *hippo* (substitution /i/→/y/) [Maja]

/televizor/→/televizo/ ‘telewizor’ *television* [Marek].

The diminishment of the word structure through the reduction of a syllable was reported in barely several words (2-, 3- and 4-syllable words):

- reductions of medial syllables  
CV-CVC-CV→CV-CV  
/goronce/→/doće/ ‘gorące’ *hot* (substitutions /g/→/d/, /c/→/ć/) [Daria]  
CV-V-CV-CV→CV-CV-CV  
/paulina/→/palina/ ‘Paulina’ [Maja]
- reduction of part of the initial syllable  
CCVC-CV→CCV  
/m̩iotʲa/→/m̩ʲa/ ‘miotła’ *broom* [Daria]
- reduction of part of the final syllable  
CV-CV-CV-CVC→CV-CV-CVC  
/xipopotam/→/xipopot/ ‘hipopotam’ *hippo* [Daria].

Epenthesis, consisting in the enriching of the word structure with a single phoneme, was reported in two words: in one of them, as a result of insertion, the number of syllables in the word increased:

- CV-V-CV→CV-CV-CV  
/koala/→/kolala/ ‘koala’ *koala bear* [Dawid]  
CCV→CV-CV  
/ćma/→/ćima/ ‘ćma’ *moth* [Dawid].

Quantitative distortions manifested themselves in the collected material to a limited extent, appearing as complete or partial assimilations; these were assimilation processes occurring at a distance, taking place first of all in respect of the place of articulation, and then in respect of the degree of closure of the speech organs:

- assimilations at a distance, regressive, complete  
CV-CVC  
/fotel/→/totel/ ‘fotel’ *armchair* /f/:t/ [Daria]  
CVC-CV  
/čapka/→/kapka/ ‘czapka’ *cap* \*/ć/:k/ (substitution /č/→/ć/) [Dawid]  
V-CV-CV-CV  
/okulary/→/utulaly/ ‘okulary’ *glasses* /o/:u/ (substitutions /k/→/t/, /r/→/l/) [Maja]
- assimilations at a distance, progressive/regressive, complete  
CV-CVC  
/rover/→/lolel/ ‘rower’ *bicycle* /v/:l/ (substitution /r/→/l/) [Daria]
- assimilations at a distance, regressive, partial  
CV-CV-CV  
/kanapa/→/mamapa/ ‘kanapa’ *sofa* /k/:p/, /n/:p/ [Daria]

- assimilations at a distance, progressive, partial  
CVC-CV  
/ńitka/ → /ńinka/ ‘nitka’ *thread* /t/:/n/ [Dawid].

Metathesis, found as an isolated change in the linear sequence of phonemes, was reported in one word only; it (metathesis) took place within a consonant group:

VC-CV  
/iguy/ → /iugy/ ‘igły’ *needles* [Dawid].

A comparatively large group consisted of words whose structure was transformed as a result of the so-called combined changes. The phenomena causing the distortion of the structure of these words were quantitative changes (simplifications of consonant groups, reductions of consonant phonemes outside of consonant groups and groups of phonemes, epentheses), assimilations, and metatheses. Substantial transformations of the phonemic-syllabic structure usually took place in multi-syllable words with a more complicated phonetic structure and lower frequency in texts, but in the recorded material there were also one- and two-syllable words, relatively often appearing in children’s texts or addressed to children. Below are the examples of combined changes with a brief explanation of the occurring distortions:

CCVC → CVC

/bżux/ → /pus/ ‘brzuch’ *stomach* [Maja]

substitutions /b/ → /p/, /ż/ → /s/ → \*/psux/; reduction of the final phoneme /x/ → \*/psu/; metathesis /s/-/u/ → /pus/

CVCC → CVC

/żuuf/ → /vuś/ ‘żółw’ *turtle* [Dawid]

substitution /ż/ → /ż/ → \*/żuuf/; simplification of consonant group /-uf/ → /-f/ → \*/zuf/; metathesis /ż/-/f/ with the preservation of resonance of initial phoneme and with devoicing in word-final position → /vuś/

CVCC-CV → CVC-CV

/maupka/ → /mamka/ ‘małpka’ *monkey* [Dawid]

simplification of consonant group /-upk-/ → /-pk-/ → \*/mapka/;

assimilation at a distance progressive, complete /p/:/m/ → /mamka/

CCV-CVC → CV-CVC

/ślimak/ → /minat/ ‘ślimak’ *snail* [Daria]

substitution /k/ → /t/ → \*/ślimat/; simplification of consonant group /śl-/ → /l-/ → \*/limat/; metathesis /l/-/m/ → \*/milat/; assimilation at a distance regressive, partial /l/:/n/ → /minat/

CV-CCVC-CV → CV-CV-CV

/jabuška/ → /paputa/ ‘jabłuszka’ *apples* [Maja]

substitutions /p/→/t/, /k/→/t/, /š/→/s/ → \*/ĭapuusta/; simplification of groups /-pu-/→/-p-/, /-st-/→/-t-/ → \*/ĭaputa/; assimilation at a distance regressive, complete /ĭ:/p/ → /paputa/  
 CV-CV-CVC-CVC→CV-CV-CV-CVC  
 /xelikopter/→/xelitopet/ ‘helikopter’ *helicopter* [Maja]  
 substitutions /k/→/t/, /r/→/l/ → \*/xelitoptel/; simplification of a group /-pt-/→/-p-/ → \*/xelitopel/; assimilation at a distance progressive, complete /l:/t/ → /xelitopet/.

In order to illustrate the character and intensity of the transformations of the phonemic-syllabic structure as a result of combined changes, we are presenting the examples of words in which the number of syllables was preserved and those in which the reduction of syllables took place (we do not include the explanation of the reported distortions on account of the limited volume of the article):

- words with the preserved number of syllables

CCVC-CV→CVC-CV

/smačne/→/satĭe/ ‘smaczne’ *delicious* [Maja]

CCVC-CVC→CCV-CVC

/traktor/→/kratok/ ‘traktor’ *tractor* [Dawid]

CCVC-CV→CCV-CVC

/spodĭne/→/špodej/ ‘spodnie’ *trousers* [Dawid]

CCVC-CV→CV-CVC

/mĭotua/→/uota/ ‘miotła’ *broom* [Dawid]

CV-CV-CVC→CV-CV-CV

/zegarek/→/šeraše/ ‘zegarek’ *watch* [Dawid]

/mikoaj/→/kiuona/ ‘mikołaj’ *Santa* [Dawid]

CV-CV-CCVC→V-CV-CVC

/fotograf/→/ototat/ ‘fotograf’ *photographer* [Maja]

CV-CV-CCVC→CV-CV-CVC

/kalafior/→/talalol/ ‘kalafior’ *cauliflower* [Maja]

CVC-CV-CV

/sandaŭy/→/tantaŭy/ ‘sandaly’ *sandals* [Daria]

CVC-CVC-CV→CV-CV-CV

/marxefka/→/xaleta/ ‘marchewka’ *carrot* [Daria]

CCVC-CVC-CV→CCV-CV-CV

/bĭedronka/→/pĭeroka/ ‘biedronka’ *ladybird* [Dawid]

CV-CCV-CVC→CV-CV-CV

/mikrofon/→/kifono/ ‘mikrofon’ *microphone* [Dawid]

CV-CV-CVC-CVC→V-CV-CV-CVC

/xelikopter/→/elitopel/ ‘helikopter’ *helicopter* [Daria]

CV-CV-CVC-CV→CV-CV-CV-CVC

- /parasolka/→/palalošek/ ‘parasolka’ *umbrella* [Dawid]  
 CVC-CV-CVC-CV→CV-CV-CVC-CV
- /xuštavečki/→/xuxuvečki/ ‘huštaweczki’ *seesaws* [Dawid]  
 CV-CV-CV-CVC→CV-CV-CV-CVC
- /xipopotam/→/xixipotek/ ‘hipopotam’ *hippo* [Dawid]  
 CV-CV-CV-CVC→CV-CV-CV-CV
- /xipopotam/→/xixipotu/ ‘hipopotam’ *hippo* [Dawid]
- words with the decreased number of syllables  
 CCV-CVC→CCVC
- /šlimak/→/šmal/ ‘šlimak’ *snail* [Dawid]  
 CVC-CVC-CV→CVC-CV
- /marxefka/→/kefke/ ‘marchewka’ *carrot* [Dawid]  
 CCV-CV-CVC→CV-CVC
- /wieloryb/→/romyl/ ‘wieloryb’ *whale* [Dawid]  
 CV-CV-CVC-CV→V-CVC-CV
- /filiżanka/→/itanta/ ‘filiżanka’ *cup* [Maja]  
 CV-CV-CVC-CV→CV-CVC-CV
- /filiżanka/→/filaška/ ‘filiżanka’ *cup* [Dawid]  
 CV-CVC-CVC-CVC→CV-CV-CV-CVC
- /kalejdoskop/→/talelopot/ ‘kalejdoskop’ *kaleidoscope* [Maja].

The collected empirical material also contains words whose different phonemic-syllabic structure is difficult to explain by the co-occurrence of pathological phonetic phenomena (as in the previously presented combined changes); their examples are as follows:

- CV-CCV-CVC→CV-CV-CVC
- /mikrofon/→/dexoxon/ ‘mikrofon’ *microphone* [Daria]  
 CV-CVC→CV-CV-CV
- /kogut/→/kokuku/ ‘kogut’ *rooster* [Dawid]  
 CCVC-CVC-CV→CV-CVC-CV
- /skarpetki/→/tutycki/ ‘skarpetki’ *socks* [Dawid]  
 CV-CV-CVC-CVC→CV-CV-CVC-CV
- /helikopter/→/kekegotke/ ‘helikopter’ *helicopter* [Dawid]  
 VC-CCVC-CV-CV→CV-CV-CVC-CV
- /ośmiornica/→/keşouyska/ ‘ośmiornica’ *octopus* [Dawid].

Words of this type are classified as non-systemic distortions but we are unable to show their character – they may be “relics” of the earlier stage of speech development in these children, which may be suggested by, e.g. the form /kokuku/ ‘rooster’, referring to the onomatopoeia *kukuryku*.

Apart from many examples of primary syntagmatic disorders, the analyzed material contained single examples of changes in the word structure caused by paradigmatic disorders, i.e. secondary syntagmatic disorders of the type of quantitative and qualitative distortions. The recorded secondary quantitative changes occurred in the cases of simplification of geminates formed from a substituted phoneme and its substitution; see the examples below:

CVC-CV→CV-CV

/śatka/→/śata/ 'siatka' *net* (substitution /k/→/t/) [Maja]

/-tk-/→/-tt-/→/-t-/

CCVC-CVC→CV-CVC

/traktor/→/tato/ 'traktor' *tractor* (substitutions /k/→/t/, /r/→/l/) [Daria]

/-kt-/→/-tt-/→/-t/ .

Changes that can be regarded as secondary qualitative syntagmatic changes are those caused by substitution and by co-occurring distortions – they were new phonemic combinations of the CV type: syllables /ti/, /ui/; the examples are as follows:

CV-CCVC-CV→CV-CCV-CV

/cukierki/→/tutjeti/ 'cukierki' *candies* [Maja]

substitutions /k/→/t/, /r/→/l/ → \*/cutjelti/, assimilation at a distance regressive, complete /c/:/t/ → \*/tutjelti/, simplification of the group /lt/→/t/ → /tutjeti/

VC-CV→CV-CV

/igła/→/uita/ 'igła' *needle* [Maja]

substitution /g/→/t/ → \*/itua/, metathesis /u/ → /uita/.

The greatest intensity of syntagmatic disorders and at the same their greatest diversity was reported in the utterances of Maja and Dawid. Out of the 120 analyzed words (in the case of each child), distortions of the phonemic-syllabic structure occurred in 108 words spoken by Maja and in 89 words spoken by Dawid. In the words distorted by Maja and Dawid there were almost all types of syntagmatic disorders: the occurrence of a large number of combined changes should be regarded as significant, and in the case of Marek – also the occurrence of non-systemic changes. Among the 73 words with a distorted structure spoken by Daria, combined and non-systemic changes appeared only in several of them. In Marek's case, syntagmatic disorders recorded in 15 words consisted exclusively in simplification of consonant groups and reduction of final phonemes.

It should be emphasized that each of the children studied articulated some of the words correctly (in the syntagmatic aspect): Maja – 12 words, Dawid – 31, Daria – 47, Marek – 105, while in the case of Maja and Dawid, among those words there were, with few exceptions, one- and two-syllable ones consisting of



open CV syllables and closed CVC syllables, also with consonant groups. Below are the examples of such realizations of the phonemic-syllabic structure of words:

➤ one-syllable words

CVC

/dom/ ‘dom’ *home* [Daria]; /paʃ/ ‘paw’ *peacock* [Daria], [Dawid]; /  
žem/→/žem/ ‘džem’ *jam* (substitution /ž/→/ž/) [Daria], [Dawid]; /ješ/→/  
ješ/ ‘jeż’ *hedgohog* (substitution /š/→/š/) [Daria], [Dawid]

CCVC

/sʊoń/→/sʊoń/ ‘słoń’ *elephant* (substitution /s/→/s/) [Daria]

➤ two-syllable words

CV-CV

/muxa/ ‘mucha’ *fly* [Dawid]; /voda/ ‘woda’ *water* [Dawid]; /vaga/ ‘waga’  
*scales* [Dawid]; /šafa/→/safa/ ‘szafa’ *wardrobe* (substitution /š/→/s/)  
[Maja]

CV-CVC

/tatuš/ *daddy* [Maja]; /balon/ ‘balon’ *balloon* [Dawid], [Daria]; /fotel/ ‘fo-  
tel’ *armchair* [Dawid]; /kotek/ ‘kotek’ *kitty* [Dawid]; /domek/ ‘domek’  
*house* [Dawid]; /kubek/ ‘kubek’ *mug* [Dawid]; /rover/→/lofel/ ‘rower’ *bi-  
cycle* (substitutions /r/→/l/, /v/→/f/) [Maja]; /xomik/→/xomit/ ‘chomik’  
*hamster* (substitution /k/→/t/) [Maja]; /kogut/→/todut/ ‘kogut’ *rooster*  
(substitutions /k/→/t/, /g/→/d/) [Daria]; /šalik/→/šalit/ ‘szalik’ *scarf* (sub-  
stitutions /š/→/š/, /k/→/t/) [Daria]

CVC-CV

/rypka/ ‘rybka’ *fish* [Dawid]; /piuka/ ‘piłka’ *ball* [Dawid]; /bapća/ ‘babcia’  
*granny* [Dawid]; /miska/→/miška/ ‘miska’ *bowl* (substitution /s/→/š/)  
[Dawid]; /uyska/→/uyska/ ‘łyżka’ *spoon* (substitution /š/→/š/) [Dawid]; /  
sanki/→/šanki/ ‘sanki’ *sledge* [Daria]

CVC-CVC

/listek/→/lištek/ ‘listek’ *leaf* (substitution /s/→/š/) [Dawid]; /garnek/→/  
dalnet/ ‘garnek’ *pot* (substitutions /g/→/d/, /r/→/l/) [Daria]

CVC-CCVC

/neźvjeć/ ‘niedźwiedz’ *bear* [Daria]

CCV-CVC

/statek/→/štatet/ ‘statek’ *ship* (substitutions /s/→/š/, /k/→/t/) [Daria]

CCVC-CV

/mlečko/→/mlečko/ ‘mleczko’ *milk* (substitution /č/→/ć/, [Dawid])

➤ three-syllable words

CV-CV-CV

/mamuša/ ‘mamusia’ *mummy* [Maja]; /jagody/ ‘jagody’ *blueberries*  
[Dawid]; /maluje/ ‘maluje’ *paints* [Dawid]

## CV-CV-CVC

/samoxut/ ‘samochód’ *car* [Maja]; /kapeluš/→/tapelus/ ‘kapelusz’ *hat* (substitutions /k/→/t/, /š/→/s/) [Maja];

/zegarek/→/žedalet/ ‘zegarek’ *watch* (substitutions /ž/→/ż/, /g/→/d/, /r/→/l/, /k/→/t/) [Daria]

## CV-CVC-CV

/motylki/ ‘motylki’ *butterflies* [Dawid]; /mušelka/→/mušelta/ ‘muszelka’ *seashell* (substitutions /š/→/ś/, /k/→/t/) [Daria]

## CCV-CV-CVC

/v̥ieloryp/→/v̥ielolyp/ ‘wieloryb’ *whale* (substitution /r/→/l/) [Daria]

## ➤ four-syllable words

## CV-CV-CV-CV

/čekolada/→/setolata/ ‘czekolada’ *chocolate* (substitutions /č/→/s/, /k/→/t/, /d/→/t/) [Maja]

/čekolada/→/cekolada/ ‘czekolada’ *chocolate* (substitution /č/→/s/) [Marek]

## V-CV-CV-CV

/okulary/→/otulaly/ ‘okulary’ *glasses* (substitutions /k/→/t/, /r/→/l/) [Daria]

/okulary/→/okulaly/ ‘okulary’ *glasses* (substitution /r/→/l/) [Marek]

## CV-CV-CVC-CV

/filižanka/→/filižanta/ ‘filižanka’ *cup* (substitutions /ž/→/ż/, /k/→/t/) [Daria]

/filižanka/→/filizanka/ ‘filižanka’ *cup* (substitution /ž/→/z/) [Marek]

## CV-CVC-CV-CV

/xulajnoga/→/xulajnoda/ ‘hulajnoga’ *scooter* (substitution /g/→/t/) [Daria]

/xulajnoga/ ‘hulajnoga’ *scooter* [Marek]

## CV-CVC-CVC-CVC

/kalejdoskop/ ‘kalejdoskop’ *kaleidoscope* [Marek].

## SUMMARY AND CONCLUSIONS

In the articulation of all the four children studied, paradigmatic disorders (in the form of phoneme distortions and substitutions) were diagnosed, accompanied by primary and secondary syntagmatic disorders. Among the primary syntagmatic disorders, almost all of their types distinguished in Kania’s classification were reported (they occurred with different intensity, both in the studied group and in individual children):

- 1) quantitative distortions consisting first of all in the diminishment of the word structure as a result of the reduction of single phonemes (final somewhat more often than initial ones), less often – phoneme groups, including syllables; the most frequent of the recorded phenomena was the simplification of consonant groups; epentheses were found sporadically; the limitation of the number of phonemes in the word (as a result of simplifications of consonant groups and reduction of consonant phonemes outside of consonant combinations) most often involved the change of a closed syllable into an open one: CVC>CV, and the change of the type CCV>CV;
- 2) quantitative distortions, manifested to a limited extent, mainly in the form of complete and partial assimilations (they were assimilation processes occurring at a distance).

In the collected empirical material a relatively large group consisted of words (usually multi-syllable ones, with a more complicated phonetic structure and lower frequency in the texts, but also one- and two-syllable words, usually known to the children) whose structure was substantially transformed as a result of combined changes; the phenomena that caused the distortion of the phonemic-syllabic structure of these words were quantitative changes (simplification of consonant groups, reductions of consonant phonemes outside of consonant groups and groups of phonemes, epentheses), assimilations and metatheses. These included words in which the number of syllables was retained despite changes, and those whose syllabic length was reduced. Examples of non-systemic distortions were also recorded: words whose different phonemic-syllabic structure is difficult to explain by the co-occurrence of pathological phonetic phenomena; they are probably “relics” of the earlier stage of speech development in these children.

In the analyzed material, apart from primary syntagmatic disorders, there were also secondary disorders: single examples of changes in the word structure caused by paradigmatic disorders of the type of quantitative distortions (simplification of geminates formed from a substituted phoneme and its substitution) and qualitative ones (new phonemic combinations caused by substitution and co-occurring distortions).

Worth noting is the fact that there were differences between the studied children both in terms of the kinds of syntagmatic changes recorded in their articulation and the frequency of occurrence of incorrect realizations. The highest intensity of syntagmatic disorders, and at the same time their greatest diversity, was recorded in the utterances of the nine-year-old girl with cerebral palsy and of the ten-year-old boy with Down syndrome – in the words they distorted (ca. 90% of words with syntagmatic changes in the girl’s articulation, ca. 75% in the boy’s articulation) there were almost all types of syntagmatic disorders, highly significant being the fact that there was a large number of combined changes, and in the boy’s

case – also non-systemic ones. In turn, about 60% of words with a disordered structure were reported in the articulation of the eight-year-old girl with Down syndrome, but combined and non-systemic changes occurred only in several of them. In the case of the eleven-year-old boy with CP, words with syntagmatic changes (consisting exclusively in the simplification of consonant groups and reduction of final phonemes) accounted for ca. 13% of the analyzed words. It is worth remembering at this point that logopedic diagnosis assumes that the presence of syntagmatic changes (regarded as typical of the undisturbed speech development in children up to 3 years) in the articulation of older children and their great intensity in the articulation of younger children proves the occurrence of speech disorders; the following are regarded as developmental phenomena: reductions of syllables, the so-called opening of a closed syllable in the final position in words, reductions of single initial and final phonemes in the word, simplifications of consonant groups, assimilations (partial, occurring in the position of neighboring elements); there are few metatheses of consonants and syllables, they occur rarely (cf. Sołtys-Chmielowicz, 1998; Stasiak, 2007; Milewski, 2013).

The presented empirical material and its analysis show the complexity of the problems pertaining to the realization of the phonemic-syllabic word structure in the speech of children with intellectual disability. In the cases when mental retardation is one of many developmental deficits that are part of a set of symptoms of a specific syndrome, the picture of speech disorders of a given individual may be complicated – multifactorial determinants result in complex symptomatology; this is usually the case, *inter alia*, in the Down syndrome (see: Fletcher, Buckley, 2002; Martin et al., 2009) and in the cerebral palsy syndrome (see: Sigurdardottir, Vik, 2011; Otapowicz et al., 2002; 2011; Peeters et al., 2008; Pennington, 2008; Mirecka, 2013b), which are part of the most frequently reported syndromes. Problems in logopedic diagnosis may result from the overlapping of, e.g. motor, intellectual, or auditory dysfunctions, which yields, as a consequence, a complex picture of symptoms connected both with the sphere of competences (linguistic, communicative and cultural) and realization possibilities. The combination of speech disorders diagnosed in the children presented in the article (oligophasia and dysglossia in the Down syndrome, oligophasia, dysarthria and dysglossia in CP) is fairly typical of these syndromes. Problems in the realization of the phonemic-syllabic structure of words may, to a different degree and in a different range, be caused by intellectual deficits characteristic of mental retardation (and become part of the picture of oligophasia), by motor dysfunctions resulting from neurological damage (as in dysarthria), or by the anatomical abnormalities of the articulatory apparatus and the nasopharyngeal cavity (broadening the range of articulatory difficulties recorded in dysglossia). In each individual there may also additionally occur different (or more intense) disorders than in the others, e.g. in auditory reception, phonological processing, auditory-kinesthetic-motor integra-

tion, memory processes, and processes of control and motor planning of speech – associated in literature with difficulties in the phonemic-syllabic realization of the structure of words (cf. Muzyka-Furtak, 2012, p. 287; Mirecka 2013b, p. 202; Czaplewska, 2015, p. 101; Coppens-Hofman et al., 2016).

In the cases of disorders resembling those found in the children presented in this article, we should certainly not seek only relationships between the nature and intensity of changes in the word structure and intellectual disability. Individual persons have individual tendencies that cannot usually be compared because of the multitude and diversity of their determinant causes. The presented examples of incorrect realizations of word structure, especially the combined and non-systemic changes, often of inconsistent nature (variability of the phonological-phonetic form of the word) signalize the problem of limitations of articulation comprehensibility, which has a negative impact on the efficacy of linguistic communication by persons with accompanying intellectual disability.<sup>12</sup> The results of the presented study are in partial accordance with the findings in the field of English in reference to Down patients: in the words they pronounce, consonant clusters are often realized as single sounds, with final and sometimes initial consonants being omitted; in seven- or eight-year-old children with Down syndrome, there are typical language disorders that are characteristic of younger children; these abnormalities usually persist in adolescence or adulthood but their intensity decreases (Stoel-Gammon, 2001). At the same time it is emphasized that both the cognitive capabilities of such persons and their speech development are distinguished by individual character. The reason that is given for the appearance of the foregoing phenomena in Danish-speaking young people and adults with moderate intellectual disability is the delay in speech development and later acquisition of next sounds as compared with people developing in accordance with the norm (Coppens-Hofman et al., 2016).

We believe that the assessment of the realization of the phonemic-syllabic word structure is significant both from the standpoint of scientific inquiry and in logopedic practice. Adequately planned studies – longitudinal and transverse – can provide explanations for similarities and differences between disorders in the word structure in speech disorders, in which they are observed at the level of symptoms and determinants, and can thereby help understand their essence (the results of studies conducted in the world, concerning other languages, can be applied to Polish-speaking patients only to a certain extent; it is difficult to transpose data if only because Polish is a so-called consonantal language full of consonantal, often multi-element groups). Practitioners, in turn, expect to be provided with procedures that would optimize the work on learning word structures (e.g.

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<sup>12</sup> Similar problems are reported in cases of specific disorders of language development, alalia, and alalia prolongata (Stasiak, 2007; Mirecka, 2010; 2011).

facilitate the selection of language material for therapy from the angle of syllabic structures and consonant clusters), thus, enhancing the level of comprehensibility of the patients' articulation. According to M. Coppens-Hofman et al. (2016), there is a significant relationship between the assessment of comprehensibility of spontaneous utterances spoken by adults with mild and moderate intellectual disability, and the realization of the phonemic and syllabic structure; moreover, these scholars argue that an adequately selected speech therapy can help remove some deficits and enhance the comprehensibility of their utterances by reducing the intensity of speaking difficulties.

In order to achieve the foregoing research and application goals, it appears necessary, in the first place, to develop appropriate diagnostic tools (standardized and normalized), enabling precise assessment of the realization of the phonemic-syllabic structure of words (not only in patients with intellectual disability). Our position on this matter largely agrees with the position of Milewski (2013), who stresses the importance of the problems concerning the syllabic structure of the word and the need to devise a tool to diagnose this aspect. We believe, however, that apart from words of the natural language, it would be also worth taking pseudowords<sup>13</sup> into account in the diagnostic procedure.

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<sup>13</sup> The existing pseudowords repetition test (TPP) (Szewczyk et al., 2015) serves to measure the phonological processing skills in children aged 4;0–8;11 years, being oriented towards identifying children with SLI and dyslexia or risk of SLI and dyslexia; it is not adapted for testing children with more serious, including intellectual deficits.

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