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Speech Dysfluency in Intellectually Disabled Persons

SUMMARY

The article examines the question, rarely discussed in literature, of speech dysfluencies in intellectually disabled persons. The description and diagnostic interpretation of the occurrence of the speech dysfluency phenomenon in the intellectually disabled is highly significant from the standpoint of logopedic theory and practice. The present article is a report on the results of tests in a 34-person group, whose goal was first of all to answer the following questions: 1) What is the percentage of persons with pathological speech dysfluencies among intellectually disabled teenagers and adults? 2) Which symptoms of pathological dysfluency occur most often in the intellectually disabled? 3) In the tested subjects, do other accompanying symptoms occur with dysfluency, which enable diagnosing speech disorder entities and programming diverse therapies? The authors also discuss the question of the relationship between sex plus the degree of intellectual disability, and the intensity and type of dysfluencies.

Key words: speech dysfluency, intellectual disability, stuttering, cluttering, oligophasia

INTRODUCTION

Most scholars, in their descriptions of speech disorders found in intellectually disabled persons, point to the frequent occurrence of speech dysfluencies. However, precise data on the phenomenon are not yet available, while the few studies that there are show very large discrepancies in the statistics and in the description of the character of dysfluencies found in this group. In the contemporary sense of the term, intellectual disability (mental retardation) is "characterized by significant limitations both in intellectual functioning and in adaptive behavior as expressed in daily social and practical adaptive skills and by the fact that these impairments originate before 18 years of age" (Schalock et al. 2010, cited after:

Żyta 2014). The etiology of intellectual disability is known to involve various factors which also cause diverse somatic disorders: genetic, pre- and perinatal factors, injury and neurological diseases, etc. That is why the manifestations of speech disorders found in intellectually disabled persons are described as part of different classification entities. This also applies to speech dysfluency. It should be also observed that different classifications of dysfluency symptoms in intellectual disability are also not only due to its different etiology but also to diverse ways of understanding speech fluency and dysfluency, adopted by individual authors.

Z.M. Kurkowski regards M.N. Hedge's definition as the best: according to the latter a fluent utterance is one without disruptions, prolongations or breaks (Hedge 1978, cited after: Kurkowski 2003, 5). Referring to the terms in speech physiology, he also cites M.R. Adams' definition, according to whom a fluent utterance starts immediately and easily and is characterized from beginning to end by the coordination of respiration, phonation and the movements of articulators because the speaker passes from sound to sound, from syllable to syllable in a continuous, forward-flowing way (Adams 1982, cited after: Kurkowski 2003, 5). Z. Tarkowski and A. Grzybowska, on the other hand, regard as the condition for "speech fluency" the "synchronization of three levels of utterance organization: the content, linguistic form and phonic substance" (Grzybowska, Tarkowski 1987, 865). Consequently, they distinguish three types of fluency, responsible for free transition from one utterance element to the next: "semantic fluency" associated with the transition to the next information, "syntactic fluency" – with the transition between successive syntactic structures, and "physiological fluency", or the correct respiratory-phonatory-articulatory coordination enabling transition to the next sound. T. Woźniak proposes the definition of speech fluency that takes phonetic, neurobiological, and logopedic research into consideration and explains the term as follows:

We should call speech fluency the problem-free construction of a phonic sequence comprehensible to the hearer. Fluency consists in the continuity of realization of successive speech sounds that are found within regularly recurring rhythmic groups (phrases), lasting about 2–3 seconds, almost identically ordered in prosodic terms. A phrase can be filled with a different number of sounds (syllables), depending on the rate of speech. Between the phrases there is a short pause whose duration is not strictly defined. In the case of uninterrupted speech, it should, however, be shorter than two seconds, because it is then of no significant value. (Woźniak 2012, 550)

On the basis of this definition, the author explains the term "speech dysfluency" – it is "a disorder of the articulatory continuity and rhythm of the succession of phrases", which is connected with the "interruption in the continuity of phonic realization of an utterance within successive rhythmic groups, and a disturbance in the regular temporal succession of these groups (phrases)" (Woźniak 2012,

551). The author also stresses that speech dysfluency can be defined as normal or pathological, depending on the kind and intensity of the occurring symptoms.

It should be remembered that complete speech fluency is a rare phenomenon. Every speaker may produce dysfluent utterances, especially when caused by emotions or stress. The following may then occur: repetitions (of sounds, syllables, words, or even parts of sentences), drawling, blocks, pauses, embolophrasias, corrections, and too rapid or too slow or unrhythmical speech (Tarkowski 1992, 13).

The terms “speech dysfluency” and “stuttering” are very often regarded as one concept in literature on the subject. It is necessary to distinguish between the two: “speech dysfluency” should be treated as a symptom occurring in different speech disorder entities, whereas “stuttering” is a specific speech disorder, in which speech dysfluency occurs as one of its symptoms (Soboń, Woźniak 2015).

Speech dysfluency in intellectually disabled persons has already been the subject of separate studies. A survey of foreign publications on the connection between intellectual disability and stuttering was made by Z. Tarkowski (1987). He cited the studies by A.N. Chapman and E.B. Cooper, which showed that in the population of the intellectually disabled, the percentage of stutterers ranged between 1 and 20%. A. Preus (cited after: Tarkowski 1987) seeks the causes of this high diversity in the lack of a precise definition of stuttering and in difficulty with carrying out a correct diagnosis because more characteristic speech disorders are more conspicuous.

G. Böhme presents three different opinions of scholars who do not agree about the connection between stuttering and intellectual disability. They maintain that 1) stuttering may occur more often in the population of the intellectually disabled than in normal persons; 2) both groups do not differ in this respect, 3) the lower the IQ, the smaller the number of stutterers (Tarkowski 1987, 65). Böhme himself espouses the last theory. In his view, in the normal population there are more stutterers with normal intelligence than the stutterers with the lower intellectual level (cf. Böhme 1983, cited after: Lechta 1994, 32). V. Lechta stresses that studies actually confirm that stuttering occurs more frequently in persons with mild disability (18.7%) than in those moderately and severely disabled (13.7%), yet in both groups this percentage is higher than in the population of intellectually normal persons (Lechta 1994, 32). In his article, Lechta (1994) cites the data concerning the percentage of intellectually disabled children-stutterers: according to various authors, it is 3.7% (M. Sovak), 26% (C.E. Webb and S. Kinde) or even 30% (M. Atzesber). The research conducted by Lechta himself showed the occurrence of stuttering in 22.7% of children.

Recent research on the kinds of speech dysfluency in intellectual disability was presented in a joint article published in 2013 in “The Journal of Communication Disorders” (Coppens-Hofman et al. 2013, 484–494). Starting from the assumption that speech dysfluency occurs in intellectually disabled persons more

often than in the general population and that it is usually treated as stuttering, the authors decided to characterize this type of dysfluency in intellectually disabled adults, taking the distinction between the symptoms of stuttering and cluttering into special consideration. This helps, they maintain, to optimize the therapy oriented towards improving the fluency and comprehensibility of utterances. To this end, spontaneous utterances of 28 adults with mild and moderate intellectual disabilities were analyzed, who were characterized as poorly intelligible by their caregivers. In 22 subjects (75%), clinically significant dysfluencies were shown. 21% of them were classified as cluttering, 29% – as cluttering-stuttering, and 25% – as clear cluttering at normal articulatory rate. The typical patterns of stuttering did not occur in this group at all. In view of these data, the scholars concluded that in this group of intellectually disabled adults, treatment should be aimed at eliminating cluttering rather than stuttering symptoms.

Considerations on the subject are also present in Polish literature. Tarkowski (2003) thinks that in Down patients, the manifested dysfluency is cluttering rather than other kinds, whereas in others, especially in those mildly intellectually disabled, stuttering is observable: its manifestations appear already from the first utterances, in this case at ca. three to four years of age, its further development proceeding in the similar way as in the rest of the population.

T. Woźniak (2015) speaks of the need to distinguish between stuttering and speech dysfluency found in intellectually disabled persons. Spasticity and logophobia, characteristic of stuttering, usually do not occur in these persons. What is characteristic of them, however, is articulatory disorders, which are not as a rule found in intellectually normal stutterers.

In view of the foregoing facts, the description and diagnostic interpretation of the occurrence of speech dysfluencies in intellectually disabled persons is of significant importance from the standpoint of logopedic theory and practice. The present article is a report on the results of testing, whose objective was first of all to answer the following questions:

- 1) What is the percentage of persons with pathological speech dysfluencies among the intellectually young people and adults?
- 2) What symptoms of pathological dysfluencies appear most often in intellectually disabled persons?
- 3) Do other accompanying symptoms appear with dysfluencies in the tested subjects that enable diagnosing speech disorder entities and programming appropriate treatment?

In the discussion, we will also deal with the question of the relationship between sex and intellectual disability versus the intensity and type of occurring dysfluencies.

MATERIAL AND METHODS

34 persons with mild and moderate intellectual disability were tested. The age of the subjects ranged from 15 to 57 years (the majority were in the 30 to 45-year range). The results of 32 persons (10 women and 22 men) were used in the present study. A complete analysis of the test results of the remaining two persons was not possible because of the highly insufficient amount of the recorded material and palatolalia, which was the excluding factor as it reduced the intelligibility of the articulation of these subjects (one person) to the extent that it made precise analysis impossible. Among the tested persons, 14 were mildly disabled and 18 – moderately disabled. Most of them were patients of the “Roztocze” Communal Home of Mutual Aid run by the Lublin Charity Association. The tested residents attend the Occupational Therapy Workshops or go the Day Activation Center housed at 2a Wallenroda St. in Lublin. It was there that the tests were carried out from October 2016 to March 2017. The tests were conducted in a separate room. They were carried out based on the syllable test described below and tape-recorded to be later played and analyzed. All the subjects were informed that they were going to be recorded and consented to the test.

The testing was conducted based on the tool developed for the needs of this study – a syllable test. The test enables the estimation of speech fluency in intellectually disabled persons. The language material in the test was adjusted to the age and abilities of the subjects. The test requires eliciting five types of utterances: 1) dialogue, based on a spontaneous conversation with the tested subject, 2) automatized text – counting to ten, naming days of the week or reciting a poem from memory, and giving one’s personal particulars, 3) naming objects presented in pictures, 4) repetition: of words, sentences and short rhymes, 5) narratives – based on three-, four- and six-element picture stories. The linguistic material obtained in individual tests was recorded and then divided into syllables during analysis, and written down in the testing protocol. With each dysfluently spoken syllable, an appropriate symbol was placed that qualitatively classified the types of dysfluency symptoms (green – normal symptoms, red – pathological): x – repetition, – – drawl, | – pause, + – inclusion. The symptoms accompanying these manifestations were described in the remarks and appended in the table at the end of the protocol. The collected language material was interpreted in the quantitative and qualitative assessment.

The quantitative analysis consisted in calculating what percentage of the general number of syllables spoken in individual tests was the number of dysfluently spoken syllables. The general percentage of dysfluency was obtained by adding up the results from five tests and by dividing them by 5. The pathology threshold was adopted, after T. Woźniak and J. Soboń (2015), as 5% of dysfluently spo-

ken syllables or 3% of dysfluencies in the case of qualitatively distinct pathology of symptoms.

The qualitative analysis assessed the type of dysfluencies and the occurrence of accompanying symptoms – muscular tension disorders, synkineses, respiratory, phonatory and articulatory disorders, disorders of utterance coherence, inappropriate speech rate, as well as eye contact disorders, and physiological stress symptoms.

Speech rate was also calculated in dialogues and narratives. For this purpose, five excerpts from the text were chosen, the duration of speaking each of them was measured (in seconds), the number of syllables spoken during that time being also calculated. The mean rate in a given test was then calculated by adding up the results and dividing the sum total by 5. It was assumed that the normal rate ranges from 2 to 4–5 syllables per second (Woźniak 2012).

RESULTS

What is the most important in the present study is the answer to the question about the percentage of persons with pathological dysfluencies in the tested group of intellectually disabled subjects. The testing conducted, using the syllable test that enabled the quantitative and qualitative analysis of speech dysfluencies in intellectually disabled persons, confirmed the thesis, voiced by many scholars, that pathological dysfluency occurs more frequently in this group than in the general population.

According to the current data, the percentage of stutterers in the normal population in the world is ca. 1% (the exact figure being 0.73 % – 1 in 135 adults) (Craig, Tran 2005, 41–46). According to various scholars, the percentage of stutterers among intellectually disabled persons ranges from 1% to over 20% (Tarkowski 1987; Lechta 1994). In light of the introductory remarks above, it appears more reasonable to interpret these figures as determining the frequency of occurrence of pathological speech dysfluencies, a symptom of diverse speech disorders, rather than a specific disorder, which is stuttering.

After conducting a detailed, quantitative and qualitative analysis of the found manifestations of dysfluency and their accompanying symptoms, a group of persons with pathological dysfluency was singled out. It consisted of nine persons – one woman (with a moderate degree intellectual disability) and eight men (five with mild disability and three with moderate disability). It follows from the data that the pathological dysfluency in the investigated group affects as much as 28.12% of the subjects; however, it should be emphasized at once that this is not tantamount to the percentage of stutterers. Failing to see the specificity of this disorder, researchers tend to classify entirely different dysfluencies as stuttering.

The diagnostic criteria for stuttering understood as a set of manifestations at the communication, mental and neurophysiological levels (Woźniak 2008, 218) were met only by two male subjects with mild intellectual disability, which accounts for 6.25% of the total number of the subjects. In the next two men, manifestations of stuttering occurred at the communicative and physiological levels while no symptoms appeared at the mental level – there is no awareness of the disorder, and no prediction of dysfluency with accompanying anxiety reactions (6.25% of the total number of the tested subjects). In the remaining five persons the cause and character of the manifestations enabled the distinction of four more types of disorders: full-blown cluttering (one man – 3.12% of the total number of the subjects), cluttering with the preserved normal rate of speaking (one woman – 3.12% of total number of the subjects), concurrent manifestations of stuttering and cluttering (two men – 6.25% of total number of the subjects), and dysfluencies related to dysarthric disorders (one male subject – 3.12% of the total number of the subjects).

Consequently, the question about the possibility of using the qualitative analysis of symptoms in the differential diagnosis of speech fluency disorders in intellectually disabled persons should be answered in the positive. An exact diagnosis is possible, and when programming a therapy, a general strategy for intellectually disabled persons should not be assumed but treatment should be adjusted to the needs of a patient.

The qualitative statistics of dysfluency disorders appear interesting: in the whole test, there were 233 symptoms of dysfluency in the subjects with pathological speech dysfluencies. The percentage distribution is as follows:

- 24.46% – repetitions of syllables,
- 23.61% – pauses,
- 19.74% – repetitions of sounds,
- 19.31% – inclusions,
- 7.73% – drawls,
- 3% – repetitions of words, and 2.15% – repetitions of phrases.

The most frequent manifestations of pathological dysfluency were repetitions of sounds and syllables (in 100% of the subjects with pathological dysfluency) and pauses (8 in 9 persons – 88.89% of the subjects). Inclusions were found in six persons (66.67%), word repetitions in five subjects (55.5%), drawls and repetitions of phrases in three subjects (33.33%).

The foregoing manifestations of speech dysfluency in the group of persons with pathological dysfluencies were not an isolated phenomenon. Pathological dysfluency was accompanied by other symptoms:

- phonatory disorders – 8 subjects (88.89%),
- muscular tension disorders – 7 subjects (77.78%),

- respiratory disorders – 7 subjects (77.78%),
- articulatory disorders – 6 subjects (66.67%),
- inappropriate speech rate – 5 subjects (55.56%),
- disorders of utterance coherence – 4 subjects (44.44%),
- synkineses – 3 subjects (33.33 %),
- disorders of eye contact and physiological stress symptoms – 2 subjects (22.22%).

The mean percentage of dysfluency in the group with pathological speech dysfluencies was 6.28% in all tests, thereby exceeding the adopted qualitative pathology threshold. The mean speech rate measured in dialogue and in the narrative was 4.85 syllables per second, which was within the upper range of the assumed norm.

DISCUSSION

The principal issue in the discussion is to consider the relationship between intellectual disability and speech dysfluency. The obtained results show without doubt the higher scores for speech dysfluency in the studied group of intellectually disabled subjects. However, the lower intellectual ability itself may not be the direct cause of dysfluency but may only occur with it. The causes of the far more frequent occurrence of pathological speech dysfluency in intellectually disabled persons can be sought in the general causes of speech disorders in this group: in the “underdevelopment of the central nervous system, brain injuries, morphological defects and dysfunctions of the speech apparatus, dysfunctions of endocrine glands, hearing impairment, and emotional disorders” (Minczakiewicz 1993, 194).

It should be also stressed that the majority of the intellectually disabled subjects (71.88%) spoke with fluency that was within the normal range. A number of dysfluency symptoms regarded as normal also appeared. It is impossible to find out whether their occurrence in intellectually disabled persons is higher than in normal persons, but it should be remembered that the manifestations of oligophasia found in these persons are related to the processes of verbal programming of utterances, and fluency in communicating them. Scholars list *inter alia* the following as symptoms of oligophasia, resulting from various factors that cause or co-occur with intellectual disability:

- drawled, incorrect realization of sounds,
- the slow pace of vocabulary development,
- lower narrative ability,
- semantic and lexical difficulties,
- difficulties with acquisition and development of syntactic competence,
- use of incorrect grammatical forms (Rakowska 2003, 127).

Most of these factors evidently affect the realization of text. The following may especially occur:

- semantic dysfluencies resulting from the poverty of ideas and from the encoding of mental content into words, phrases, or longer utterances,
- lexical dysfluencies resulting from problems with memory, a limited vocabulary, and from difficulties in selecting words,
- grammatical dysfluencies stemming from difficulties in the acquisition of the language system and from not knowing inflection and syntax,
- (less frequently) syllable dysfluencies that often occur in the situation of communicative stress (Szamburski 2012, 370–373).

Dysfluencies of this kind appeared in all the tested subjects, therefore, a thorough analysis is necessary in order to distinguish, particularly in persons qualified as speakers with pathological dysfluency, the symptoms caused, for example, by the insufficient knowledge of words and grammatical rules from those indicative of pathology. An especially thin borderline between these dysfluencies may appear in persons aware of their dysfluency and predicting its possible occurrence. A dysfluency that may seemingly appear less pathological in the sense that a person has difficulties building the text may actually result from logophobia and selection of easier words, with which a dysfluency is less likely to occur.

Altogether, in the whole test, in all speakers whose fluency was within the normal range, there were 578 dysfluencies classified as non-pathological. The percentages of particular non-pathological manifestations are as follows:

- pauses – 66.08%,
- inclusions – 17.13%,
- repetitions – 13.96%,
- drawls – 2.94 %.

Compared with the group with pathological dysfluencies, the most essential differences concern the frequency and kinds of repetitions and drawls, and the occurrence of symptoms accompanying dysfluency. These symptoms are the principal basis for the differential diagnosis of speech fluency disorders.

The testing also showed differences in speech fluency and occurrence of symptoms, both normal and pathological, depending on the type of utterance. The syllable test used in testing made it possible to elicit dialogue, automatized text, naming, repetition, and narrative. The degree of dysfluency turned out to depend largely on the degree of independence (i.e. being unassisted) in utterance: the more independence it required, the more dysfluencies there were. The most dysfluencies were recorded in test 1 – dialogue, and test 5 – narrative (a total of almost 78% of all pathological manifestations). The third test with most dysfluencies was one in which the subjects named pictures by themselves, and the dysfluencies were fewer in this case. The fewest dysfluencies occurred in automatized sequences and in

repetitions. These observations are similar to the conclusions about the intensity of dysfluencies in intellectually normal stutterers (cf. Sidor 2011).

Interestingly enough, in the majority of the subjects (80% in women and 77.27% in men) there were incidental manifestations of dysfluency, which can be qualitatively classified as pathological. Because of the insignificant degree of intensity, these dysfluencies did not influence the general assessment of utterances. In contrast, there are interesting results of seeking the relationship between sex plus the degree of disability, and the intensity of pathological dysfluency in the whole studied group. In general, there were three times as many pathological dysfluencies per one man than per one woman. In men, the mean number of pathological manifestations was 10.78, and in women – 3.18. This result is connected with a larger number of men in the group with pathological dysfluencies. Remember, that in this group (9 out of 32 subjects) the proportion between men and women was 1:8.

The smallest number of pathological symptoms per person and their lowest diversity was recorded in the group of women with mild intellectual disability. Drawls, inclusions, and repetitions of phrases did not occur here. Pathological pauses, repetitions of sounds and words were found to be 0.33 per person.

In contrast, several times more dysfluencies than in all the other groups were found in men with mild intellectual disability. There was a total of as many as 16.36 dysfluencies per one man with mild intellectual disability: most of them were pauses (4.82 per person, but they occurred in 63.6% of subjects in the group) and syllable repetitions (4.36 per person, with the occurrence in 72.7% of subjects in this group). Repetitions of sounds appeared in the same number of subjects as repetitions of syllables did, but they were somewhat fewer (3.27 per person). This was also the only group in which all types of manifestations of dysfluency were reported.

In all the tests, there were 3.73 pathological manifestations per one woman with moderate intellectual disability. All manifestations appeared here, except drawls. The greatest number was that of inclusions (1.29 per person), which, however, were found in barely 28.6% of subjects in this group, the next were repetitions of sounds (0.86 per person) and syllables (0.71 per person) and these occurred in the largest number of subjects – 42.9% and 57.1%, respectively. Altogether, any kinds of pathological manifestations were reported in almost 86% of women in this group.

In men with moderate intellectual disability there were 5.34 manifestations per person in all the study – most of them were repetitions of syllables (1.9 per person, found in 54% of subjects in the group), inclusions (1.6 per person, found in 18.2% of subjects) and repetitions of sounds (1.27 per person, in 45.5% of subjects). The fewest were drawls – barely 0.09 per person, and in 9.1% of subjects in the group. Repetitions of phrases did not appear at all. In general,

pathological manifestations appeared in 63.63% of subjects in this group, which is the smallest number of persons with pathological manifestations in all the distinguished groups.

The results of the study, thus, point out the fact of the highest intensity of speech dysfluency in the group of men with mild intellectual disability, which agrees with the data cited by other authors (cf. Lechta 1994). We may argue that the male sex and higher level of intelligence increase the probability of speech fluency disorders in the case of intellectually disabled people. However, this thesis requires evidence based on additional studies on a larger population.

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