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ON THE PROFILE OF THE LEVEL OF FORMATION OF LINGUISTIC SKILLS IN CHILDREN WITH MILD, MODERATE AND SEVERE INTELLECTUAL DISABILITY

Abstract. People with intellectual disability (in this paper, the authors use the definition of intellectual disability and the degrees of its manifestation given in the fifth edition of the book “Diagnostic and Statistical Manual of Mental Disorders” [4, p. 33]) make up a significant portion of the general population. Although their functioning has been a subject of interest for researchers in many fields, the matter of communication and its disorders noted in this group remains an interesting area of study. In this work, an attempt was made to determine a profile of language skills in children with intellectual disability to a mild, moderate or severe degree. Samples of independent speech, collected in a group of 240 children with intellectual disability, were used, along with those of 156 pupils of typical public schools and pre-schools. In order to provoke the study subjects to make utterances, the eliciting technique was used. In this manner, samples of dialogue speech, as well as description and story-telling were collected, as these three forms of utterance are the most important for the development of communicative skills and for colloquial social communication. Altogether over 65 hours of recordings were obtained. The collected study material was analysed, due to which a total of 38,283 words were noted as well as 13,250 phrases in the speech of children with intellectual disability, while the speech of the control group contained 31,709 words and 7179 expressions. On the basis of the gathered data, it was possible to determine the number and average use of words, the average length of utterance built by the child, the occurrence of verbal and non-verbal utterances, degree of grammatical complexity of the study subjects’ speech, as well as the range of active vo-

cabulary. Data obtained in the study group with intellectual disability were compared with the results of children of typical development. The results of groups with a similar mental age were set against each other. The conducted statistical analysis allowed one to determine which of the differences existing between the compared groups was of particular significance.

Keywords: intellectual disability; children with intellectual disability; oligophrenopedagogy; speech development; linguistic skills; speech activity; lexemes; typical development.

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People with intellectual disability (ID)¹ make up a relatively numerous section of the general population (ca. 1-3%) (Carson, Butcher, Mineka 2003: 766; Marcelli, Cohen, 2013: 234; Hatton 2012: 14). For a long time they were pushed onto the margins of society, restricting their access to

education, work and ability to arrange their own life in the environment (Westling, Fox 2008). Over the last few decades, efforts have been made so that such people could meet with greater social acceptance and that their role in social life was enhanced. A departure from segregation and isolation was promoted in favour of social inclusion and integration (Błęszyński 2012: 187).

As a group whose development and level of functioning diverges

¹ For this work we have accepted the definition of intellectual disability contained in the *Diagnostic and Statistical Manual of Mental Disorders. Fifth Edition* (2013: 33) as well as its indicated degrees of disability.

from the norm, it has aroused the interest of many researchers. However, rarely have linguists or speech therapists shown interest; thus the development of speech and the level of linguistic communication among this group remains a matter that has not been well studied, and is significantly less well-known than the acquisition of speech among typically developing children (Ogletree i in. 2011). The results of studies conducted until now require supplementation and verification, especially as they were conducted mainly by educators, psychologist and doctors, making use of a different conceptual apparatus than linguists. It also seems necessary to support many claims functioning in the literature with concrete studies, which would allow verification of the description of linguistic competence and ability of this group of people, as well as empirically and statistically confirm conclusions often made intuitively.

Taking up this issue is also important for its practical aspects. The necessity of better recognising the linguistic competence and abilities of people with intellectual disabilities results from the increasing participation of this group in social life, including the increasingly frequent participation of intellectually disabled children in mass education. Getting to know their developmental difficulties and

problems in the area of expression and perception of speech allows better understanding of the educational and therapeutic needs of such children. The research which is the basis of this monograph is thus a part of efforts towards inclusion and full integration of those with intellectual disability.

Research methodology¹

Since relatively rarely have the independent spoken utterances of intellectually disabled people been described, focussing rather on the written sub-code, in this work spoken phrases formed by the study subjects were analysed, recognising that in these may be found more information on their linguistic competencies. Free, spontaneous utterances of children were studied, which is particular valuable for a description of language competence and abilities.

This article presents an analysis of data extracted from the utterances of 396 children. The study group consisted of 240 children with ID, while the control group was made up of 156 pupils of public schools and pre-schools (from 4 to 10 years old). The study involved 140 children with ID of a mild degree (making up 58% of the study

¹ In the text, charts and tables, for the reader's convenience the following abbreviations are used: *intellectual disabilities* - ID and *typical development* - TD.

group), 70 - moderate (29% of those surveyed) and 30 (13%) – severe. These data are illustrated in chart 1. Among children with declared ID there were 107 girls and 133 boys, making up respectively 45% and 55% of the study group. Children in the ages of 9 to 15 years were studied.

The participation in the study of people with severe ID should be noted, as this group is usually

treated together with others, and rarely are the characteristics of their communication subjected to scientific study. The study was preceded by an analysis of psychological-pedagogical documentation. Thus, excluding criteria included an un-supportive home environment, institutional upbringing, as well as genetic defects and diagnosed child cerebral palsy.

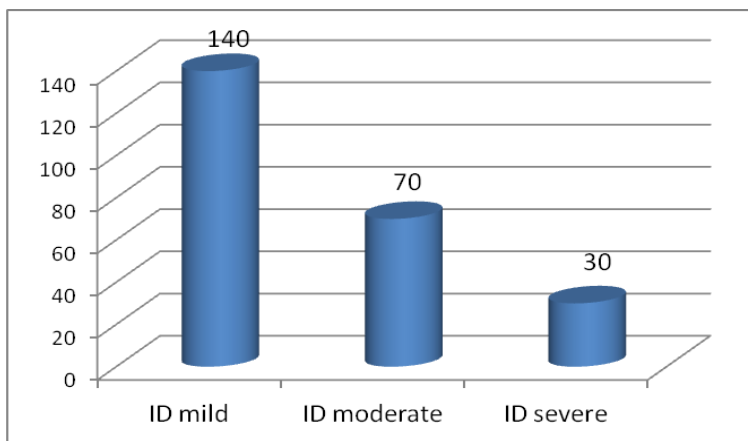


Chart 1. Composition of the study group.

The control group consisted of 156 children, pupils and preschoolers of public schools and preschools, in the ages of 4 to 10 years. The research which forms the basis of this work was conducted from 2004 to 2014.

Each of the children included in the test participated in four trials, whose purpose was to provoke the study subject to form longer

phrases, based on illustrated material. Use was made of picture techniques with verbal stimuli (instructions), which are included among basic techniques used for the purpose of eliciting a longer utterance by the pupil. This is therefore called *eliciting technique* (Menn, Bernstein Ratner 2000). The use of such a method allows one to obtain a sample of free utterances by chil-

dren, elicited in a certain situational context, with the use of the same image stimuli for the whole group and a single procedure. This limits the range of content and facilitates comparison of the gathered utterances. In this manner samples were collected of speech dialogue, but also description and story-telling, as these three forms of utterance seem most important both for the development of communicative abilities as well as for colloquial social communication.

The purpose of the undertaken research was to indicate and describe differences in certain significant aspects of linguistic competence and ability, existing between children with ID to a mild, moderate or severe degree and children of TD, chosen according to mental age. According to provisions of the International Statistical Classification of Diseases and Related Health Problems (ICD-10 1998; 2000), we compared the results of the following groups:

- children with ID of a severe degree with 4- and 5-year-olds of TD,
- children with moderate ID with 6-, 7- and 8-year-olds of TD,
- as well as children with ID of a mild degree with 9- and 10-year-olds of TD.

Research results

Through the tests about 65 hours of recordings were obtained. The extensive study material was seg-

mented and analysed, due to which a total of 38,283 words and 13,250 phrases were extracted from the speech of children with ID, while from the recordings of the control group there were 31,709 words and 7179 phrases.

Due to the large amount of collected study material, attention was focussed on a few, most important matters from the point of view of communication with another person:

The number of words used by the study subject was determined, calculating the average used by a child and the number of structured phrases, allowing one to calculate the average length of phrase built by children with ID and of TD (**the mean length of utterance - MLU**)². The average length of utterance was calculated, determining the ratio of number of words to number of phrases. This work did not include the use of average length of expression based on morphemes, as this measure is relatively less trustworthy in the case of children above 5 years of age (Leonard 2006: 48).

– Determination was made of differences existing between groups in the frequency of occurrence of

² MLU is recognised as one of the most commonly used indicators of the level of linguistic development of children. It is most often measured in words or morphemes (Reber, Reber 2008: 773; cf. Crystal 2008: 300).

verbal (i.e. containing a verb)³ and non-verbal utterances, calculating their average percentage in the overall number of phrases formed by the study subjects;

– the most important objective of the research was to determine the degree of grammatical complexity constructed by the study subjects. We concentrated on an analysis of basic inflectional-syntactic structures⁴, based on observation of inflexional forms and word combinations within the phrase. Inter-word relations (accommodative and non-accommodative) in the children's utterances were distinguished, and then an analysis of their frequency was conducted. Dividing the number of words building a given utterance by the number of syntactic relations which include these words, the so-called *indicator of syntactic density* was obtained. The lower the value of this indicator, the greater share of syntactic relations in the text, which may be recognised as a higher level of complexity of utterance. In determining this factor in this work, all the syntactic relations were used, both accommodative and

non-accommodative. It should be emphasized here that this is the first such broad use of this indicator in linguistic research. The indicator of syntactic density may be considered especially useful in studies on the speech of people with ID, as it allows one to obtain objective and precise data. In descriptions of the communicative capabilities of this section of the population, it is very often emphasized that these are poor and grammatically simplified utterances; however, such descriptions, though undeniably true, require confirmation which is enabled by conducting statistical analysis of the data.

In the subject literature in general, attention is drawn to the restricted vocabulary range of children with ID; therefore:

– in order to evaluate the range of vocabulary of the study subjects, we determined the number of lexemes⁵ in utterances of the studied groups of children, and then their average use among the study subjects;

– among the lexemes, verbal lexemes were distinguished, whose frequency and average use were treated as a factor distinguishing the two groups of children. In testing

³ The work assumes that such an understood phrase is the dominant syntactic unit, which is divided into verbal expressions (containing a verb predicate), or sentences, and non-verbal expressions (not containing a verb predicate).

⁴ Word relations (ros. словосочетание), or syntactic relations. syntactic relations in a phrase refer to agreement, order, and enclosure.

⁵ The authors assumed that lexemes (or dictionary words) are abstract units of the grammatical-semantic system, represented in the text by various grammatical forms in the case of variable lexemes (Nagórko 2006: 76; cf. Crystal 2008: 276).

linguistic competence and skills, thus the ability to build grammatically correct sentences, it is important to determine the use of verbs. Their role in forming utterances, and thus syntactic units as minimal informational units, is indisputable for researchers, regardless of the syntactic theories that they may support.

The set of data was then supported by their statistical analysis, which allowed one to indicate significant differences between the compared groups. Through analysis we obtained a concrete and extended description of language competence and ability in children with diagnosed ID. The study results indicated that the study group is more varied than assumed, and in certain aspects clearly divides into two sub-groups: people with ID of severe degree as well as of a mod-

erate or mild degree, which is contrary to the commonly used, in subject literature and in practice, division into groups with mild and more profound disability.

As characteristics decidedly distinguishing all subjects with ID from the control group, selected according to mental age, the following should be recognised:

1) **the mean length of utterance (MLU)** – the subjects with ID built shorter phrases than those noted in the control group. This regularity concerned all study trials. A clear majority of differences which appeared between the groups had a statistically evident nature, so the average length of utterance constructed by children with ID is lower than expected at a given level of mental age. The results obtained in particular samples are gathered in table 1.

Table 1. Mean length of phrase built by study subjects in particular samples

Sample	Children with severe ID	4- and 5-year-olds of TD	Children with ID moderate	6-, 7- and 8-year-olds of TD	Children with mild ID	9- and 10-year-olds of TD
I	2.03	3.35	2.16	3.79	2.54	5.67
II	1.87	2.73	2.17	3.42	2.71	4.19
III A	2.31	3.19	3.09	6.24	4.66	7.88
III B	2.47	2.85	3.12	5.92	4.26	7.15

2) the percentage share of non-verbal phrases in the overall number of phrases constructed by study subjects. In each of the conducted trials it was observed that non-verbal phrases are for intellectually disabled children a significantly larger part of all phrases noted in their speech. All of the differences had a statistically significant character, so it may be recognised that a characteristic feature

of this group is the significantly more frequent construction of phrases without a verbal predicate than in the control group (table 2).

3) the mean use of non-verbal phrases by children – the subjects with ID in all trials constructed significantly more of these than the selected control group. Their average use was therefore considerably higher than expected at a given level of mental age (table 3).

Table 2. Average percentage share of non-verbal phrases in the overall number of phrases built by study subjects in particular samples

Sample	Children with severe ID	4- and 5-year-olds of TD	Children with ID moderate	6-, 7- and 8-year-olds of TD	Children with mild ID	9- and 10-year-olds of TD
I	65.08	40.14	66.71	31.07	58.67	8.01
II	68.15	48.26	70.26	56.27	65.24	48.05
III A	29.53	3.21	19.32	3.3	9.01	0.48
III B	29.89	4.17	16.46	5.20	8.46	2.63

Table 3. Average use of non-verbal phrases in utterances of study subjects

Sample	Children with severe ID	4- and 5-year-olds of TD	Children with ID moderate	6-, 7- and 8-year-olds of TD	Children with mild ID	9- and 10-year-olds of TD
I	7.20	2.50	6.59	3.59	8.10	0.83
II	14.53	10.31	19.70	13.94	18.61	11.17
III A	1.73	0.12	1.29	0.19	0.81	0.04
III B	2.00	0.23	1.24	0.40	0.90	0.23

4) the average number of constructed word relations – analysis of data clearly confirmed that children with ID (regardless of its degree) used considerably fewer word relations than those of TD chosen by mental age. In all conducted trials, the differences existing between the compared groups were statistically significant (table 4).

5) the indicator of syntactic density – the level of complexity of speech of the intellectually disabled turned out to be considerably lower than in the control groups. Therefore, the syntactic abilities of those studied with mental retardation were recognised to be significantly lower than expected at a given level of mental age (table 5).

Study of the remaining aspects did not allow for such clear conclusions:

1) the average number of words turned out to well distinguish the study groups with mild or moderate ID, who used considerably fewer words than the control group selected according to mental age. All of the differences observed between these groups were statistically significant. However, in the case of children with severe mental retardation, the obtained results were close to those of 4- and 5-year-olds of normal development, while in two of the four conducted trials, the results were at the level of expectations for a given mental age (table 6).

Table 4. Average use of word relations in particular samples

Sample	Children with severe ID	4- and 5-year-olds of TD	Children with ID moderate	6-, 7- and 8-year-olds of TD	Children with mild ID	9- and 10-year-olds of TD
I	4.67	7.81	5.97	16.82	11.46	20.10
II	6.43	17.92	12.23	27.04	18.62	36.62
III A	2.77	3.58	7.46	18.15	17.69	25.40
III B	2.33	3.96	8.63	20.08	19.14	28.35

Table 5. Ratio of syntactic saturation in particular samples

Sample	Children with severe ID	4- and 5-year-olds of TD	Children with ID moderate	6-, 7- and 8-year-olds of TD	Children with mild ID	9- and 10-year-olds of TD
I	6.74	3.01	5.26	3.41	4.90	2.21
II	7.86	4.56	7.94	3.97	7.90	3.22
III A	5.40	3.19	3.86	2.14	2.56	2.00
III B	4.40	3.85	3.72	2.23	2.61	2.10

Table 6. Average use of words in particular samples

Sample	Children with severe ID	4- and 5-year-olds of TD	Children with ID moderate	6-, 7- and 8-year-olds of TD	Children with mild ID	9- and 10-year-olds of TD
I	20.17	19.73	21.26	38.64	32.67	42.37
II	41.87	60.19	63.36	85.74	79.15	101.13
III A	11.83	10.27	19.63	37.91	38.69	50.25
III B	9.23	11.38	21.77	42.42	42.13	58.17

Table 7. Average lexeme use in study subjects' utterances

Sample	Children with severe ID	4- and 5-year-olds of TD	Children with ID moderate	6-, 7- and 8-year-olds of TD	Children with mild ID	9- and 10-year-olds of TD
I	14.80	15.58	15.56	28,67	23.71	32.98
II	27.27	41.42	38.64	54,58	48.13	63.85
III A	9.47	8.65	15.06	26,38	26.06	34.25
III B	6.97	9.38	16.19	27,53	27.59	36.40

2) **the variance of vocabulary range**, which was determined by calculating the average number of lexemes (dictionary words) used by the study subject, was to confirm the thesis of a smaller range of words at the disposal of children with ID. However, in each of the conducted trials, only those subjects with a diagnosed mild or moderate level used on average considerably fewer lexemes than the pupils of TD selected by mental age, while all of the apparent differences were statistically significant. The group with severe disability again turned

out closest in their level to that of typically developing children, in two trials reaching a range of used lexemes at the level of mental age (table 7).

3) analysis of **the mean use of verbal lexemes** confirmed that children with ID of mild or moderate level have considerably fewer verbal lexemes in their range of active vocabulary, and their use is considerably less than that noted in the groups of TD and similar mental age. In the case of the severely disabled group, the differences were not so obvious (table 8).

Table 8. Average use of verb lexemes in study subjects' utterances

Sample	Children with severe ID	4- and 5-year-olds of TD	Children with ID moderate	6-, 7- and 8-year-olds of TD	Children with mild ID	9- and 10-year-olds of TD
I	2.53	3.08	1.99	6.42	3.44	6.92
II	5.20	9.85	7.01	11.83	8.69	13.13
III A	3.57	3.23	4.87	7.85	7.45	9.29
III B	2.10	3.96	5.49	9.01	8.89	11.38

Conclusion

The research on which this article is based is only an attempt at describing a few chosen aspects of linguistic competence and skills in children with intellectual disability. **Analysis of the gathered data has allowed confirmation of apparent differences between the compared groups of study subjects of similar mental age, both in the length of constructed utterances as well as in the vocabulary range and syntactic complexity of speech.**

Therefore, while analysing the syntactic aspect of children's utterances, it may be recognised that it diverges from the expected level at a given mental age in the whole group of participants with ID, while in the case of the lexical level the group with severe ID obtained a level similar to that typical for mental age. In order to explain this phenomenon, one should take under consideration the nominal age. The group of subjects with a diagnosed severe degree were the oldest in age (average age - 14 years, in the case of the remaining groups - 12 years);

their results were set against 4- and 5-year-old pre-schoolers, as the mental age of people with severe ID is at the level of 3 to less than 6 years. In acquiring vocabulary, the time factor is thus important – in the case of this group of participants, they had extended their vocabulary range for 9 or 10 years longer than children of the control group, which allowed them to reach a level similar to that of pre-schoolers of normal development. However, this time was not translated into progress in the area of syntactic skills, the formation of which depends to a greater extent on cognitive functions. It may therefore be stated that up to a certain level of mental age, vocabulary range is similar or adequate to expectations, but above this level, children of TD enrich their vocabulary significantly faster than subjects with ID of similar mental age (MA) and between the study participants considerable disproportions appear. In the case of syntactic abilities, the differences are considerable regardless of MA level.

It should be emphasized that the ratio of syntactic saturation turned out to be especially useful in describing the linguistic abilities of children, allowing one to precisely evaluate the complexity of syntactic complexity of utterances and to make comparisons between particular groups. The conducted statistical analysis of data confirmed the formulated conclusions.

The group with ID is characterised by a communicative disability (Griffer 2012: 240–241), which appears at the level of each language system. In order to support people with ID and enable them to function fully and satisfyingly in society, it is necessary to get to know their manner of communicating, describing its strong and weak sides. Meanwhile, the speech and language development and communicative abilities of people with intellectual disability are a relatively rarely explored area of study, especially by linguist and speech therapists. In order to be able to offer help, stimulate the communicative skills of this group and make their communication more effective, it is necessary to thoroughly study and characterise what could be termed a biolect of people with intellectual disability.

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