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APHASIA: THE CASE STUDY

1. INTRODUCTORY REMARKS

The main concern of this paper is aphasia. This disorder was defined by Roman Jakobson as "the severe loss or limitation of speech understanding and production following brain damage or neurological disfunction" [Jakobson 1971].

I would like to present a discussion of the language of an aphasic child. The research and all the tests were conducted between September 1991 and April 1992. Language disturbances will be presented on the four main linguistic levels: phonology, morphology, syntax, and discourse. First I will discuss the history of the disorder and then I will concentrate on the four linguistic levels and investigate into deficits and regularities in language development of this child. Only then will I compare his linguistic performance to that of a normal child.

2. THE HISTORY OF THE DISORDER

Mike was born in January 1986. No disorders in his mental or physical development were found until two years of age. His mother says that Mike seemed to be a normal child. He grew, put on weight, crawled and walked. She did not notice any abnormalities in his mental development. He responded to speech with a smile, he babbled and even started speaking first words: mama (mum) and tata (dad). Around the age of two years she got worried as Mike did not make any progress in speech. He did not develop speech but stopped at the lalling stage. She consulted several doctors, but they could not find any cause why the speech had not evolved

yet. They tried to calm her by saying that Mike might have not been ready to talk yet, but that soon he would develop whole-sentences speech. She waited one year longer. In the meantime Mike was examined thoroughly. No symptoms of any abnormality were found. When Mike was three he began to visit a logopaedist regularly. One year passed and Mike's speech did not improve. In 1990 Mike began regular visits at the Phoniatric Clinic. Psychological examination brought the evidence that Mike had a very high IQ equal 114. Psychological tests showed that Mike was not mentally disabled but that only his speech was disordered. The psychologists found that Mike had difficulties with hand and leg movement control, and that his graphic tests performance was a little below the normal level.

Neurological examination and EEG tests did not display any brain damage. A neurologist found that Mike's articulators were efficient but he had difficulties in control of their movements. The doctor also found that Mike's hearing was not impaired, but his reaction to aural stimulus was delayed. The neurological diagnosis was aphasia. The doctor advised further aphasic rehabilitation.

In December, 1990, Mike's rehabilitation was taken over by Alina Kankiewicz. At that time Mike did not come into verbal contact with other people. He used gestures, body movements and facial expressions to communicate with others. He could produce only some unintelligible sounds. Yet at the same time he could hear and understood what was said to him. He responded in gestures to other people's speech and performed what he was told to.

Kankiewicz began the rehabilitation with hand, lips, tongue movement control practice (contouring of different objects, cutting out, modelling in plasticine, constructing in blocks, sticks; lip and tongue shaping). Two months later Mike was able to produce first syllables: to, bo, wo, and string together to identical syllables: toto, bobo, wowo. In the next three months he acquired all Polish oral vowels, although their quality was somewhat different from the standard. He could produce onomatopoeic sounds like: koko, muu, bee, kuakua, kuku, sss. He was able to produce plosive consonants as well as fricatives s, z.

After the summer holidays Mike's vocabulary developed but still he used onomatopeic sounds for more difficult words (e.g. tuptup ⟶ iść (go); koko ⟶ kura (hen); am ⟶ jeść (eat). He could not produce sounds such as: j, l, ł, r, affricates and nasal vowels. During 1991 he acquired l, ł, r, ą, ę into his phonological system. But he couldn't produce j and affricates yet. More detailed phonetic analysis is presented below. Mike could not follow the Polish inflectional system but used the Nominative singular in most cases. He began to distinguish grammatical genders. He did not use personal pronouns, only demonstrative and interrogative

pronouns. He usually omitted prepositions. Onomatopeic words had been eradicated, but he used them in an extremely stressful situation and then his speech got unintelligible again.

In my opinion he was at the two-word stage of language development. Sometimes he joined more words but the relations between them were often wrong. He was not able to produce longer utterances, if so his production became unintelligible.

In the Phoniatric Clinic he was working on developing of the four language skills. He could link some sounds with letters and he could read one-syllable words if he knew the letters and remembered how to produce them. It was very difficult for him to string single sounds into a word. This inhibited development of the reading skill. Writing was not practised yet because Mike learnt only capital block letters, and he still had problems with hand movement control. Besides, it would be too difficult for him to learn 2 kinds of block letters and two kinds of handwritten letters, because he could easily forget what he had learned and he needed constant repetition of almost everything he had learned earlier.

Even things that seemed to be deeply rooted in his memory were easily forgotten if they were not drilled and repeated.

3. PHONOLOGICAL DESCRIPTION

In the phonetic test I administered to Mike in December 1991 Mike was asked to repeat Polish sounds presented to him in syllables and words. These syllables and words were organized in minimal pairs. Following distinctive features were taken into consideration in the descritption of the sounds:

1) vibration of the vocal folds,
2) position of the soft palate,
3) place of articulation,
4) manner of articulation,
5) shape of the lips,
6) position of the tongue.

The aim of the test was to show which features are impaired most, and what processes are characteristic of aphasis speech, if there are any. The test was based on tests described by H. Mierzejewska [1971].

Vibration of the vocal folds causes voicing of consonants. If the vocal folds do not vibrate the consonant is voiceless. Movement of vocal folds is responsible for the difference between sounds: p : b; c : dz; ti : dg; ł : d; k : g.

The minimal pairs produced by Mike showed that he was not able to differentiate vocally between two sounds which differ with only one feature. Most of the voiced sounds were devoiced when produced in minimal pairs. In a spontaneous performance Mike could produce both voiced and voiceless consonants and he had no problem with their production.

The position of the soft palate determines production of nasal or oral sounds. If the soft palate is raised, the air-stream goes through the oral cavity, and nasal cavity is closed. It results in the production of oral sounds when the soft palate is lowered, the air-stream goes through the oral and nasal cavities and nasal sounds are produced. Position of the soft palate determines the differences between sounds: b : m, a : ą, e : ę.

Mike was able to control movement of the soft palate. He perceived differences between oral and nasal sounds. The production of nasal consonants involved no problem and they were well contrasted with their oral equivalents. Nasal vowels were more difficult for him to produce. A few months earlier he could not produce them at all. He used only oral vowels. After some time he could produce sounds, quality of which similar to that of nasal vowels. He produced nasalised oral vowels followed by nasal consonant.

Another factor that determines the quality of sounds is the place of articulation. Different sounds have different points of articulation in the oral cavity. Some sounds are produced with the closure in the front part of the cavity, others in the middle part, yet some others are produces with the closure at the back. This feature determines differences between such sounds as: b : g; t : k; f : h; m : n; l : j.

I found that the places of articulation were different from the standard. The contrast between b and g, t and k, m and n was very clear. But Mike had difficulty with the pronunciation of h and j. He tended to substitute other sounds for them. In the minimal pair /finka:hinka/ h was substituted with f as if he could not perceive any difference between these sounds. In another pair /ruv:ruh/ h was deleted at the end of the word. j was never pronounced. It was either deleted (as in /jeden → eden/) or substituted with l (as in /jajko → lalko/).

The obstruction made by the organs at the point of articulation may be total, partial or may constitute a narrowing. The manner of articulation determines differences between such sounds as: d:z; t:c; i:ti; v:w; l:r; j:.

I found that in Mike's case, the manner of articulation was the most impaired feature. He had a lot of difficulties with the construction of the proper obstruction in the mouth. He seemed to have no control over the atriculators. Plosives and fricatives were the least impaired sounds and the contrast between them was the clearest. Affricates and glides were the most impaired sounds. Affricates were usually produced as dental fricatives,

whereas glides were substituted with l and v (e.g. ko*0* → koc; ko*0*ka → kaczka; bale → baje; vada → wada).

The kind of aperture formed by the lips and position of the tongue determines production of vowels.

Mike produced most of the Polish vowels correctly, although their quality might have changed in different contexts. If the vowel was proceeded by a consonant, which was difficult for him to pronounce, then the production of the vowel was slightly impaired. He concentrated on the most difficult element and when he overcame it, the relief left its impact on the production of the following sounds. This was the case with vowel a in syllables: va, ja, wa. The open vowel a was produced as half open, fronted vowel whose quality was similar to that of d.

Other vowels were produced correctly but at high level pitch. The only exception was y. Mike did not contrast i and y. Both vowels were realised as i.

Errors that Mike made in the phonological performance were not random. He developed a consistent phonological system and followed several processes just like normal children do. These processes are:

1) assimilation,

2) substitution,

3) deletion for the consonants in the word (e.g. /murorог/ – muchomor (toadstool), /vyvyva/ – wyrywa (pull out),/kukutki/ – jagódki (blueberries), /dzietonta/ – dziesiąta (tenth).

Substitution – one sound is substituted for another

– affricates were substituted for dental affricative (e.g. /o*0*y/ – oczy (eyes), /le*0*y/ – leczy (cure), /vaka*0*je/ – wakacje (holidays), /*0*arne/ – czarne (black), /ko*0*/ – koc (blanket), /noże/ – nodze (leg), /*0*awo/ – ciało (body)),

– glides were substituted for liquids and one liquid for another (e.g. /lalko/ – jajko (egg), /Mikola/ – Mikołaj (Nicholas), /dalel/ – dalej (further), /zamiatala/ – zamiatała (swept), /palila/ – paliła (smoked), /lobila/ – robiła (made), /logi/ – rogi (horns)),

– trill was substituted with tap (e.g. /kura/ – kura (hen), /ruv/ – rów (ditch), /vur/ – wór (sack),

– [z] and [i] were substituted with [z] and [s] (e.g. /kaska/ – kaszka (cereals), /moze/ – morze (sea), /talez/ – talerz (plate), /swisi/ – słyszy (hear)),

– voiced consonants were substituted with voiceless ones (e.g. /maki/ – magi (magic), /sasytu/ – zeszytu (copybook), /targi/ – targi (fair)),

– palatalized consonants were substituted with their nonpalatalized equivalents (e.g. /p*0*sek/ – piasek (sand), /belem/ – bielę (paint white), /vur/ – wiór (shaving chip).

Among deletion processes the most common were: single consonant deletion (either initial or final):

– deletion of initial or final [h] (e.g. /ru/ – ruch (traffic), /qe/ – chcę (want), /mury/ – chmury (clouds),

– deletion of initial or final [j] (e.g. /tuta/ – tutaj (here), /eden/ – jeden (one), /apka/ – jabłka (apples), /poku/ – pokój (room)),

– cluster reduction (e.g. /zesenta/ – zwierzęta (animals), /sytkie/ – wszystkie (all), /pavom/ – prawą (right hand), /sy*0*epki/ – przyczepki (trailers), /va/ – dwa (two), /dabina/ – drabina (ladder), /de*0*/ – deszcz (rain), /şieg/ – śnieg (snow), /şieci/ – świeci (shine), /gu*0*ki/ – gruszki (pears), /niasto/ – gniazdo (nest), /şienta/ – święta (holidays), /katki/ – kwiatki (flowers), /gaztki/ – gwiazdki (stars), /buska/ – bluzka (blouse), /*0*arta/ – czwarta (fourth), /zesien/ – wrzesień (september), /pa*0*er/ – spacer (walk), /pot/ – płot (fence), /kud/ – gwóźdź (nail).

In most cases Mike followed Polish accentual pattern in which penultimate syllable in the word is stressed. But in longer words he divided them into syllables and scanned then. Then all the syllables were equally strong. If the syllable consisted of sounds that Mike could not pronounce he usually reduced it and it became the weakest syllable in the word. Initial syllables were usually less prominent than the final ones. Mike's speech was characterized by a very high level of pitch. It sounded very childish.

4. AGRAMATISM

The aim of the inflectional test I made was to find answers to the questions:

1) What are the grounds of morphological disintegration in aphasic speech?

2) Are all the cases equally receptive for aphasic disintegration?

To get answers to these questions, I made a test in which the patient was to supply the correct form of a particular word. The examiner provided the context in which the word should be used, and the patient had to finish the sentence with an appropriate form of the word shown in the picture. For example, the examiner would say: "To jest..." ("This is a...") and point to the picture, then she would say: "Nie ma..." ("There is no...") and close the book. All of the forms of nouns tested, together with the context and the context are mentioned below.

All of the nouns had concrete meanings and they represent all 3 genders (masculine, feminine, neuter). Most types of inflectional patterns were also taken into consideration.

To find out if there was any relationship between the form of the word and its phonetic realisation, there were introduced short, simple words like dom (house), żaba (frog) and long and difficult words such as zwierzę

(animal), garnek (pot). Some forms of the words required sound alteration in the stem and some did not.

The results of the test were the basis for the conclusions about the regularities and irregularities in aphasic speech.

Abreviations used below:

N – Nominative
G – Genitive
D – Dative
Acc. – Accusative
I – Instrumental
L – Locative
V – Vocative – not tested
sg. – singular
pl. – plural
[ ] – expressions produced by the examiner
{Block letters – expected form, Italics – produced forms}

This test was based on the tests conducted by Hanna Tomaszewska-Volovici (1976). But the number of words tested was reduced and pictures were introduced to speed up recollection of a given word.

[To jest] dom *domek* (house – diminutive N. sg.)
This is a house
[Mieszkam w] domu *domu* (house – G. sg. or L. sg.)
I live in a house
[Przyglądam się] domowi *domu* (house – G. sg. or L. sg.)
I am looking at a house
[Nie ma] domu *domu* (house – G. sg. or L. sg.)
There is no house
[Mówię o] domu *domu* (house – G. sg. or L. sg.)
I am talking about a house
[To jest] drzewo *drzewo* (tree – N. sg.)
This is a tree
[Nie ma] drzewa *drzewa* (tree – G. sg.)
There is no tree
[Widzę] drzewo *drzewo* (tree – Acc. sg.)
I see a tree
[Mówię o] drzewie *drzewo* (tree – N. sg. or Acc. sg.)
I am talking about a tree
[Przyglądam się] drzewu *drzewo* (tree – N. sg. or Acc. sg.)
I am looking at a tree
[To jest] garnek *garnek* (pot – N. sg.)
This is a pot

[To są] garnki *garnki* (pot – N. pl.)
These are pots
[Nie ma] garnków *garnki* (pots – N. pl.)
There are no pots
[Mama gotuje zupę w] *garnku garnki* (pots – N. pl.)
Mum is cooking soup in a pot
[To jest] grzyb *grzyb* (mushroom – N. sg.)
This is a mushroom
[To są] grzyby *grzybki* (mushroom – diminutive N. pl.)
These are mushrooms
[Nie ma] grzybków *grzybki* (mushroom – diminutive N. pl.)
There are no mushrooms
[Widzę] grzyby *grzybki* (mushroom – diminutive N. pl.)
I see mushrooms
[Mówimy] o grzybach *grzybki/grzybku* (mushroom – diminutive N. pl./ L. sg.)
We are talking about mushrooms
[Niosę koszyk z] grzybami *grzybki* (mushroom – diminutive N. pl.)
I am carring a basket with mushrooms
[Przyglądam się] grzybowi *grzybku* (mushroom – diminutive L. sg.)
I am looking at a mushroom
[Przyglądam się] grzybom *grzybkom* (mushroom – diminutive D. pl.)
I am looking at mushrooms
[To jest] koń *konik* (horse – diminutive N. sg.)
This is a horse
[To są] konie *koniki* (horse – diminutive N. pl.)
These are horses
[Nie ma] konia *konika* (horse – diminutive G. sg.)
There is no horse
[Patrzę na] konia *konika* (horse – diminutive Acc. sg.)
I am looking at a horse
[Jadę] koniem *konikiem* (horse – diminutive I. sg.)
I am riding a horse
[To jest] młotek *młotek* (hammer – N. sg.)
This is a hammer
[To są] młotki *młotki* (hammer – N. pl.)
These are hammers
[Nie ma] młotka *młotka* (hammer – G. sg.)
There is no hammer
[Nie ma] młotków *młotki* (hammer – N. pl.)
There are no hammers
[Tata wbija gwóźdź] młotkiem *młotkiem* (hammer – I. sg.)

Dad is driving a nail with a hammer
[Przyglądam się] młotkowi *młotek* (hammer – N. sg.)
I am looking at a hammer
[Przyglądam się] młotkom *młotkiem* (hammer – I. sg.)
I am looking at hammers
[To jest] oko *oko* (eye – N. sg.)
This is an eye
[To są] oczy *oka* (eye – G. sg.)
These are eyes
[Nie mam] oka *oka* (eye – G. sg.)
I have no eye
[Nie mam] oczu *oka* (eye – G. sg.)
I have no eyes
[Patrzę jednym] okiem *okiem* (eye – I. sg.)
I am looking with one eye
[Zmrużyłam] oko *oko* (eye – Acc. sg.)
I blinked an eye
[To jest] pies *piesek* (dog – diminutive N. sg.)
This is a dog
[Nie ma] psa *piesek* (dog – diminutive N. sg.)
There is no dog
[Widzę] psa *pies* (dog – N. sg.)
I see a dog
[Widzę] psy *pieski* (dog – diminutive N. pl.)
I see dogs
[Idę na spacer z] psem *pieskiem* (dog – diminutive I. sg.)
I am walking with a dog
[To jest] ręka *ręka* (hand – N. sg.)
This is a hand
[Daj mi] rękę *rękę* (hand – Acc. sg.)
Give me your hand
[Mam dwie] ręce *ręce* (hand – N. pl.)
I have two hands
[Umyj] ręce ręce (hand – Acc. pl.)
Wash your hands
[Pokaż mi] rękę *rękę* (hand – Acc. sg.)
Show me your hand
[Piszę prawą] ręką *ręce* (hand – N. sg.)
I am writing with my right hand
[Idę z] rękami [w kieszeniach] *ręki/ręce/rękami* (hand – G. sg./N. pl./I. pl.)
I am walking with my hands in pockets
[To jest] samochód *auto/samochód* (car – N. sg.)

This is a car
[To są] samochody *auta* (car – N. pl.)
These are cars
[Nie ma] samochodu *auta* (car – G. sg.)
There is no car
[Tata jeździ] samochodem *samarą* (samara – I. sg.)
Dad goes by car
[Opowiadam o] samochodzie *auta* (car – N. pl.)
I am talking about a car
[Opowiadam o] samochodach *auta* (car – N. pl.)
I am talking about cars
[To jest] ucho *ucho* (ear – N. sg.)
This is an ear
[To są] uszy *ucha* (ear – G. sg.)
These are ears
[Myję] uszy *ucha* (ear – G. sg.)
I am washing ears
[Słucham] uchem *ucham* (ear – o)
I am listening with an ear
[To są] zęby *zęby* (tooth – N. pl.)
These are teeth
[To jest] ząb *zęb* (tooth – Ø)
This is a tooth
[Nie ma] zęba *zęba* (tooth – G. sg.)
There is no tooth
[Dentysta leczy] zęby *zęba* (tooth – G. sg.)
Dentist treats teeth
[To są] zwierzęta *zwierzątki/zwierzęty* (animal – Ø/Ø)
These are animals
[To jest] zwierzę *zwierzątko* (animal – diminutive N. sg.)
This is an animal
[Nie ma] zwierząt *zwierzątki* (animal – Ø)
There are no animals
[Lubię] zwierzęta *zwierzątki* (animal – Ø)
I like animals
[Opiekuję się] zwierzęciem *zwierzątkiem* (animal – diminutive I. sg.)
I am looking after an animal
[Opiekuję się] zwierzętami *zwierzątkami* (animal – diminutive I. pl.)
I am looking after animals
[To jest] żaba *żabka* (frog – diminutive N. sg.)
This is a frog
[To są] żaby *żabki* (frog – diminutive N. pl.)

These are frogs
[Nie ma] żaby *żabki* (frog – diminutive G. sg.)
There is no frog
[Widzę] żabę *żabkę* (frog – diminutive Acc. sg.)
I see a frog
[Przyglądam się] żabie *żabkie/żabkce/żabki* (frog – Ø/Ø/diminutive N. pl.)
I am looking at a frog

The Quantative Analysis

CASE	Number of forms	Correct forms	Non-correct forms
N. sg.	14	13	1
N. pl.	13	10	3
G. sg.	9	8	1
G. pl.	5	0	5
D. sg.	5	0	5
D. pl.	2	1	1
Acc. sg.	6	5	1
Acc. pl.	6	4	2
I. sg.	8	6	2
I. pl.	3	1	2
L. sg.	4	1	3
L. pl.	2	0	2
Total	77	49	28

Diminutives and synonyms used by the patient instead of the expected word were considered to be correct if the applied ending and alterations in the stem were correct.

The Quantative Analysis

CASE	Total no forms	Correct forms	Non-correct forms
1	2	3	4
N. sg. with alteration in stem	8	7	1
no alteration in stem	6	6	0
N. pl. with alteration in stem	8	6	2
no alteration in stem	5	4	1
G. sg.with alteration in stem	4	3	1
no alteration in stem	5	5	0
G. pl. with alteration in stem	2	0	2
no alteration in stem	3	0	3
D. sg. with alteration in stem	3	0	3
no alteration in stem	2	0	2
D. pl. with alteration in stem	0	0	0
no alteration in stem	2	1	1

1	2	3	4
Acc. sg. with alteration in stem	3	2	1
no alteration in stem	3	3	0
Acc. pl. with alteration in stem	1	0	1
no alteration in stem	5	4	1
I. sg. with alteration in stem	1	1	0
no alteration in stem	7	5	2
I. pl. with alteration in stem	1	0	1
no alteration in stem	2	1	1
L. sg. with alteration in stem	2	0	2
no alteration in stem	2	1	1
L. pl. with alteration in stem	0	0	0
no alteration in stem	2	0	2
Total with alteration in stem	33	19	14
no alteration in stem	44	30	14

The quantitative analysis of Mike's speech showed that distribution of grammatical morphemes was disordered in about 35%. His production was quite intelligible although it still might cause difficulties in its reception, especially for an unprepared person. The cases that provoke most errors were: Genitive plural, Dative singular and Locative plural. The realisation of these cases was distorted in 100%. Production of Locative singular and Instrumental plural was also deformed in about 70%. The least affected cases were Nominative singular, Genitive singular and Accusative singular. Their production was disordered from 7 to 17 per cent.

It seemed to me that frequency at which the cases appear in oral production decided about the rate of deformation.

On the other hand number of endings characteristic for a particular case had no influence upon the production. Locative plural, which has only one characteristic ending -ach was produced erroneously almost every time, whereas Nominative singular which has wide spectrum of different endings was distorted only in about 7%.

Necessity to change a sound in the stem of the word also induces errors in ending application. Production of forms with sound alternation in the stem was distorted in 40% while forms with no sound alternation were distorted in 30%. In some cases this gap was even greater. Accusative plural with sound alternation was distorted in 100% whereas forms of that case where no alternation was required was distorted only in 20%. In Instrumental plural and Locative singular the ratio was 2/1.

The Quantitative Analysis

1) Disintegration of distribution of grammatical morphemes

a) in the same inflectional pattern

Nominative Expected Form Produced Form Change
drzewo (tree) drzewu → drzewo D. sg. → N. sg./Acc. sg.
drzewo (tree) drzewie → drzewo L. sg. → N. sg./Acc. sg.
dom (house) domowi → domu D. sg. → G. sg./L. sg.
garnki (pots) garnków → garnki G. pl. → N. pl./Acc. pl.
młotki (hammers) młotków → młotki G. pl. → N. pl./Acc. pl.
młotki (hammers) młotkom → młotkiem D. pl. → I. sg.

b) in different inflectional patterns
– diminutives
grzyby (mushrooms) grzybów → grzybki G. pl. → N. pl. of a diminutive
grzyby (mushrooms) grzybach → grzybki L. pl. → N. pl. of a diminutive
grzyby (mushrooms) grzybami → grzybki I. pl. → N. pl. of a diminutive
grzyby (mushrooms) grzybowi → grzybki D. sg. → L. sg. of a diminutive
D. sg. → D. sg. of a neuter nouns
koń (horse) koń → konik N. sg. → N. sg. of a diminutive
konie (horses) konie → koniki N. pl. → N. pl. of a diminutive
koń (horse) konia → konika G. sg. → G. sg. of a diminutive
koń (horse) koniem → konikiem I. sg. → I. sg. of a diminutive
pies (dog) pies → piesek N. sg. → N. sg. of a diminutive
pies (dog) psa → piesek G. sg. → N. sg. of a diminutive
psy (dogs) psy → pieski N. pl. → N. pl. of a diminutive
pies (dog) psem → pieskiem I. sg. → I. sg. of a diminutive
żaba (frog) żaba → żabka N. sg. → N. sg. of a diminutive
żaba (frog) żaby → żabki G. sg. → G. sg. of a diminutive
żaby (frogs) żaby → żabki N. pl. → N. pl. of a diminutive
żaba (frog) żabę → żabkę Acc. sg. → Acc. sg. of a diminutive
dom (house) dom → domek N. sg. → N. sg. of a diminutive
– diminutive with vowel alternation in the stem of the word
zwierzęta (animals) zwierzęta → zwierzątki N. pl. → N. pl. of a diminutive with ending of feminine nouns ę : ą alternation – correct
zwierzę (animal) zwierzę → zwierzątko N. sg. → N. sg. of a diminutive
zwierzęta (animals) zwierząt → zwierzątki G. pl. → N. pl. of feminine nouns G. pl. → G. sg. of feminine nouns
zwierzę (animal) zwierzęciem → zwierzątkiem I. sg. → I. sg. of the diminutive
zwierzęta (animals) zwierzętami → zwierzątkami I. pl. → I. pl. of the diminutive

2) Disorders in sound alternation in the stem of the word
a) with a proper ending
ząb (tooth) ząb → zęb N. sg. → N. sg. ą : ę no alternation required
żaba (frog) żabie → żabkce D. sg. → D. sg. of a diminutive k : c alternation required k preserved in presence of c

b) with wrong ending

pies (dog) psa → pies Acc. sg. → N. sg. ie: o alternation required, not realised

żaba (frog) żabie → żabkie D. sg. → D. sg. of feminine nouns. The goal was to produce the diminutive żabce; difficulties with k : c alternation; wrong ending.

oczy (eyes) oczy → oka N. pl. → N. pl. of neuter nouns; no k : cz alternation

oczy (eyes) oczu → oka G. pl. → N. pl. of neuter nouns; no k : cz alternation

uszy (ears) uszy → ucha Acc. pl. → Acc. pl. of neuter words no ch : sz alternation

ucho (ear) uchem → ucham I. sg. → no such ending in Polish; difficulty in phonetic realisation of e

ręka (hand) ręką → ręce I. sg. → N. pl. k : c alternation is not required

ręce (hands) rękami → ręki I. pl. → G. sg. rękami → ręce I. pl. → N. pl. k : c alternation is not required

garnek (pot) garnku → garnki L. sg. → N. pl. e : o alternation is correct

młotek (hammer) młotkowi → młotek D. sg. → N. sg. e : o alternation required; not performed

3) Disintegration of distribution of the whole words

samochód (car) samochód → auto N. sg. → N. sg. of a synonym masculine → neuter

samochody (cars) samochodu → auta N. pl. → N. pl. of a synonym

samochód (car) samochodu → auta G. sg. → G. sg. of a synonym

samochód (car) samochodem → Samarą I. sg. → I. sg. of a synonym masculine → feminine

samochód (car) samochodzie → auta L. sg. → G. sg. N. pl. of a synonym

samochody (cars) samochodach → auta L. pl. → N. pl. of a synonym

The material gathered during the test revealed that disorders in distribution of grammatical forms were either of morphological or phonetic character.

Morphological disorders result in unsystematic distribution of grammatical morphemes or whole words. This meant that the patient had all the grammatical forms at his disposal, but he did not use them in an adequate context. As a result, grammatically and phonetically correct forms of words stop playing their grammatical function. For example, the word drzewo (tree) was produced correctly and such a form of the word appears in Polish inflectional system. It is usually used in subject position because it is Nominative singular. But Mike used this form instead of Dative singular drzewu (tree). Although drzewo was grammatically correct, its function was wrong.

The endings attached to the stem may come from different inflectional patterns. Sometimes we are not sure which ending was used because endings of several cases sound identically. If the patient said: grzybki (mushrooms diminutive) instead of grzybowi (mushroom Dative), we could not be sure if he applied the ending of a Locative singular of the word grzybek (mushroom diminutive). Or he used the ending -u because it was characteristic for Dative singular. So perhaps the patient did not know which inflectional pattern it belonged to.

Such confusion of inflectional patterns was well-visible in the word zwierzęta (animals). The ending -a is characteristic for feminine nouns but the word zwierzęta (animals) is neuter. The patient did not recognize that fact and inflected the word according to the feminine inflectional pattern. A similar situation was with the words ucho (ear) and oko (eye). The ending -o is characteristic for neuter nouns, but the words oko (eye) and ucho (ear) are irregular nouns and they have their own inflectional patterns. The patient did not seem to know it and inflected these words in plural according to the neuter pattern of inflection, disregarding pecularities of the two words.

Sometimes the application of an ending requires sound alteration in the stem of the word. If the sound is not changed or deleted, the attached ending is different from the proper one. I would expect that the alternation of sounds in the stem of the words ucho (ear) and oko (eye) would cause application of the proper ending. Since the alternation is not performed the endings are improper as well.

Sometimes the patient could not free himself from the form he heard or produced earlier. This was the case with the words drzewo (tree), domu (house), garnki (pots). Perhaps the patient would produce correct forms if they appeared in other linguistic environment and not one by one.

The other factor that causes disintegration of grammatical system was difficulty in phonetic realisation of some sounds. All of the vowels in Polish function as inflectional morphemes so vowel alteration results in morpheme deformation or its conversion into some other morpheme. For example, production of the word uchem (ear – I. sg.) was slightly deformed and Mike said ucham. Here e was changed into a. Both morphemes -em i and -am appear in Polish, but -em is characteristic for I. sg. of masculine nouns whereas -am marks the first person singular of the present tense and it is never attached to nouns. But production of the form ucham was influenced by the environment. The whole sentence was: Patrzę okiem, a słucham uchem. (I am looking with an eye and listening with an ear). The verb słucham (listen) is similar to the noun uchem (ear). Analogy resulted in production of the two almost identical words: słucham (listen), ucham.

The two forms żabkie (frog) and żabkce are still better examples of phonetic difficulties. Here the patient tried to produce the correct form żabce (frog D.sg.) and gradually he got closer to that form. He could not free himself from the form żabka, but he felt that there was something wrong with his production. He recalled the correct form and tried to make the articulators to follow the brain program.

When the patient faced production of long phonetically difficult words he looked for other, simpler words that would express the same meaning. For example, the patient never said samochód (car), but he kept using auto (car). Even if asked to repeat the word samochód (car) he did not want to. He knew that samochód (car) and auto (car) had the same meaning because he pointed to them when he heard either of these words. He was able to find other words to substitute the word samochód (car). He used the name of the car Samara when he had to finish the sentence: Mój tata jeździ... (My dad goes by...). The expected form was samochodem (car I. sg.) but Mike said Samarą. The form of the word used was correct and the applied ending was chosen well too, although Samara is of feminine gender, whereas the form previously used by Mike auto is neuter. It shows that the patient was able to switch from one inflectional pattern to another. On the other hand, he omitted words which were too difficult for him to produce and looked for shorter equivalents.

5. DISINTEGRATION OF DISCOURSE

The aim of the test was to show whether the patient was able to operate on the discourse level and what kinds of disorders would appear there.

The patient was shown some pictures, and his task was to say what he saw and what was going on in the pictures.The pictures were very simple. Their basic images were: spring, summer, in the forest. The patient was encouraged to speak spontaneously. When he stopped talking the doctor asked him some more questions to elicit longer utterances.

I also recorded his speech during his free play with a puzzle.

In these samples of texts phonological disorders were ignored, but I am giving agrammatic forms Mike used. The sentences were formed on the basis of pauses that Mike made during his speech.

Wiosna. Spring.
Michał wie. Chłopak grabi; pan kopie. Grządki robi. Sadzi.
Pan sadzi truskawki. Ona grządki. Sieje kwiatki.
Mike knows. A boy is raking; digging. A man is digging; (He)

patches is making. Planting. A woman in planting
strawberries. She patches. (She) is sowing flowers.

Lato. Summer.
Kosi trawę maszyną. Nie ma silnika. Tutaj ropa jest. On
grabi trawę. Ona kwiatki woda, żeby urósł. On koszyk zbiera.
On zrywa koszyka. Pani truskawki. Pani kopie. Pani chwasty.
To chwasty są. Wyrywa chwasty. Pani chwasty.
(He) is mowing grass with a machine. There is no engine.
Here crude oil is. He is raking grass. She flowers water to
grow. He basket is picking. He is picking basket. A woman
strawberries. She is digging. The woman weeds. These weeds
are. (She) is pulling the weeds out. The woman weeds.

W lesie. In the forest.
To jest koszyk. To musi mówić? Chłopak, dziewczynka. Nie wie
po co siedzą w lesie. I widzą zwierzę. Nietoperz to? Jedzą
jabłuszko, śliwki, owoce. To jabłuszko jest. Nie wie.
Jagódki. Króliki. Jeż. Ssss. Koza. Nie rogi. Jeleń.
This is a basket. This must speak? A boy, girl. (He) does
not know what for are they sitting in the forest. And they
see an animal. A bat this? They are eating an apple, plums,
fruits. This an apple is. Does not know. Blueberries.
Rabbits. Hedgehog. Sss. Goat. Not horns. Deer.

Układanka obrazka (Gęsi na podwórzu). Puzzle
Same ptaszki. Nie wszystkie ptaszki? Tutaj musi być tak?
Drzewo takie. Może tutaj? Nie wie drzewo. Tutaj było.
Only birds. Not all birds? Here must like this? Such a tree.
Maybe here? Does not know tree. Here was?

As the example proved the structure of discourse is different from the standard. Mike used single words rather than sentences to communicate. Words were accompanied by gestures, facial expressions and body movements. It was difficult to elicit speech with sentences or any type of longer utterances. In my opinion he was at the two-word stage of his linguistic development. He tried to join nouns and verbs, but he could maintain correct relations between them with difficulty. The easiest relation was when the subject was in Nominative singular, when it was easy to add a verb in the correct form (e.g. On grabi (he is raking), pani siedzi (woman is sitting), on zrywa (he is picking)). Sometimes the subject of the sentence was correct since in Polish we can guess the subject from the verb form.

But Mike felt that subject was important in order to make the sentence clear and so he tried to add subject to the sentence. It was really difficult for him to keep the whole utterance in his memory. The result was that the addition of the subject caused dalation of some other parts of sentences (e.g. Sadzi → Pani sadzi (Planting → Woman is planting)).

Sometimes he enumerated what he saw in the picture, and then he tried to organize the words into an utterance. He repeated content words several times, trying to combine them (e.g. Pani chwasty → To są chwasty → wyrywa chwasty → Pani chwasty (Woman weeds → These are weeds → pulling the weeds out → Woman weeds)).

Another regularity I found in Mike's speech was a lack of prepositions (e.g. on koszyk zbiera (he basket is picking); on zrywa koszyka (he is picking basket). The lack of prepositions is characteristic for aphasic speech. Mike omitted them in majority of cases. He used prepositions only in very frequent expressions (e.g. w lesie (in the forest)). Sometimes the lack of prepositions resulted in a wrong form of the word that followed the prepositions (e.g. zbiera koszyk (picking basket) for zbiera do koszyka (picking to the basket)) but sometimes the form of the following word was correct in spite of the lack of the preposition (zrywa koszyka (picking basket) for zrywa do koszyka (picking to the basket)).

Another characteristic feature of Mike's spontaneous speech was the total lack of adjectives and adverbs. He almost exclusively used nouns, verbs and pronouns. When forced to, he was able to describe objects using words: small (mały), big (duży) and names of colours but in spontaneous speech he ignored the element of evaluation and concentrated on the concrete facts. The result was that his talk sounded like child's telegraphic speech. Main objects and activities were mentioned but utterances were ambiguous. (For example, Pani truskawki (woman strawberries) we do not know whether she eats, picks or grows strawbwerries unless we have a look at the picture).

Negation was formed in a very simple way. The word nie was performed before the word which was to be negated (e.g. nie wie (does not know), nie rogi (not horns), nie wszystkie (not all)). Verbs are negated in this way in Polish. But with nouns the situation was more complex. He usually used whole sentences to negate a noun. I mean that we introduce verbs which we negate and through the negation of the verb, the noun is also negated (e.g. To nie jest stół (This not is the table)). Sometimes direct noun negation is possible (e.g. to nie stół, lecz krzesło (This not a table but chair). Mike overused this direct noun negation.

Talking about himself Mike used the 3rd person singular of the verb. Whenever used pronoun ja but always said his name. It seemed as if he talked about some other boy (e.g. Michał wie (Mike knows), musi mówić? (must speak?), nie wie (does not know) instead of ja wiem (I know), muszę mówić (must I speak), nie wiem (I don't know)).

Questions were signalled by means of intonation. Generally Mike changed patterns of intonation according to the goal of communication. Intonation was really important in his speech. By means of it he expressed meanings even if the words he uttered were unintelligible.To sum it up, the structure of the discourse is different from the standard. I would rather call it a heap of words that aims to express certain meanings. Mike was able to enumerate objects, to name activities, to express his needs, to talk about relations between people, objects, etc. He was unable to organize his speech according to the hierarchy of importance of some items. He concentrated on the minutest details ignoring self-evident, more eneral easier to perceive facts. He was incapable of evaluation, abstraction, reasoning, generalization.

Difficulties in self-expression were compensated with gestures, facial expressions and body movements. These paralinguistic features accompanied Mike's verbal performance and they often were used alone to convey meanings which he could not express in words. Sometimes he tried to say something but his speech was unintelligible and his listeners might have had difficulties with understanding the message. Through feedback Mike found out that his message had not been understood and he invented other means to convey the meaning. He acted out what he had tried to say. He could jump, walk or point to pictures, persons or objects that had something in common with his message. Onomatopeic sounds and single syllables or words accompanied this acting out. Trying to convey the meaning he used all the possible means he had. He never gave up and expected cooperation. He wanted his listener to guess what he wanted to say and he got upset when the listener was passive. Mike had never been taught a sign language but he used some conventional and unconventional signs to express some meanings. He shoock his head saying yes or no; he shrugged his shoulders saying I don't know or I don't care; apart from these conventional, self-evident gestures he used some unique signs, which he invented himself. For example, his fingers march on the desk – it meant somebody was going somewhere. Who and where was added in words, but the verb was presented visually. The unconventional signs were used rather seldom and they were eradicated. Gradually speaking took over the role of sings.

6. CONCLUSION

The purpose of my paper was to prove that development of speech in aphasia reflects the child's language acquisition. The observation and tests that I made while studying Mike's verbal performance confirm this hypothesis.

During the interviews with Mike's mother I found that he used to babble like any normal child. He started to talk mama (mum) and tata (dad) and he repeated sounds he heard around. The difference was that he never developed "true speech". But with the help of the doctor he was making constant progress in speaking. At first he used only single syllable or combination of two identical syllables to express certain meanings. He always used the same syllable to express the meaning and one syllable had only one meaning. For example he used to say tuptup for go or la-la for sing. Then he started to use words instead of the syllables. Gradually single words were linked together in pairs. The sequence of words in these pairs was fixed: nouns always appeared before verbs and verbs before adverbs. In this way Mike constructed his own version of pivot grammar. With time his vocabulary was expanded and he no longer was able to use pivot grammar so he made first generalizations. He found that some endings are characteristic for certain cases. If joined to a word they modify it and the word is given a proper function. Mike started discovering and developing grammar consistent with adult standard. Over generalisations are characteristic for child language. They help the child to construct a correct grammar. By making mistakes the child checks if the form he constructed is correct or not. Mike just like normal child discovered and developed grammatical rules of Polish. The inflectional test showed that Mike had already acquired some characteristic inflectional endings and he extended these endings to nouns like oczy, uszy, ręce which have their own specific inflectional patterns. It confirms my hypothesis that he discovered rules of grammar and generalized them like normal children do. Only later would he find that some words in the language are irregular and they need other specific rules.

The development of Mike's phonological repertoire also resembled acquisition of sounds in normal children. The first sounds he produced were a and m. The former is a vowel that requires maximum opening, and the latter is a consonant produced with a complete closure in the oral cavity. Acquiring these sounds Mike followed the principle of maximal contrast. This principle is found to be characteristic for acquisition of speech in normal children. Later Mike acquired other consonants. These were oral consonants (b, t) in contrast to nasal m. The first vowels he could produce were a, i, u. Again these three vowels are maximally contrasted with one another. The consonants p, t, m, n constitute the minimal consonantal system and the three vowels a, i, u constitue the minimal vocalic system of all the languages in the world. These were the sounds that Mike acquired first. Only after that he acquired other, more difficult sounds like nasal vowels [, ę and laterals l, r. He could not produce affricates and glides which are considered to be the most difficult sounds of the Polish language.

Analysis of Mike's verbal performance shows clearly that his speech development was similar to that of a normal child. One could argue that he was not an aphasic child but quality and frequency of errors he made suggested the kind of aphasic disorder.

He kept forgetting things he learned earlier and he needed a constant repetition and confirmation of what he knew. He had problems with speaking but they were accompanied by motor difficulties especially hand control movements.

The phonetic errors he made were very frequent and persistent. The difficulty was often not in production of single sounds but in their combination and transition from one sound to another. This suggests that brain programming and control of speech was impaired.

The words he used were content words. They were almost exclusively nouns, verbs, adjectives and adverbs. The function words were lost. The utterances tend to be reduced to two-word sentences. His speech was slow, full of errors, attempts of self-correction and hesitation.

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Kamila Ciepiela

AFAZJA: STUDIUM PRZYPADKU

W artykule zaprezentowano wyniki badań nad językiem pięcioletniego chłopca, który w wyniku uszkodzeń mózgu powstałych w czasie porodu nie rozwinął mowy właściwej. Po wnikliwych badaniach okazało się, że chłopiec cierpi na afazję.

Afazja została zdefiniowana przez R. Jakobsona jako poważna utrata lub ograniczenie rozumienia i produkcji mowy następujące w wyniku uszkodzenia mózgu lub dysfunkcji neurologicznych [Jakobson 1971].

Artykuł zawiera analizę języka afatycznego dziecka w czterech głównych poziomach języka czyli: fonologii, morfologii, składni i dyskursie. W każdym poziomie przedstawiany jest deficyt językowy afatyka i przeprowadzone analizy ilościowe i jakościowe.

Wyniki przeprowadzonych badań i testów wskazują, że dziecko znajduje się na etapie „dwóch słów" lub mowy telegraficznej i udowadniają, że akwizycja języka u dziecka afatycznego przebiega podobnie jak u dziecka normalnego. Afatyk stosuje te same zasady w przyswajaniu języka, a kolejność przyswajania poszczególnych elementów mowy jest bardzo zbliżona do tej obserwowanej u dzieci normalnych.