

ANETA DOMAGAŁA  
Maria Curie-Skłodowska University in Lublin  
Department of Logopedics and Applied Linguistics

## Register of lexical difficulties in patients with mild or moderate stage of Alzheimer's dementia\*

### SUMMARY

The article presents the register of lexical difficulties in patients with mild and moderate stages of Alzheimer's dementia, examples of the phenomena, and their quantitative characteristics. The studies were carried out using the linguistic material obtained in a group of 120 patients with Alzheimer's dementia under the research project "Narrative and Its Disorders in Alzheimer's Dementia. *The Scale of Narrative Skills in Alzheimer's Dementia*" (project manager: Dr Aneta Domagała; 39<sup>th</sup> Ministry of Science and Higher Education competition of research projects).

**Keywords:** Alzheimer's dementia; anomy; lexical skills; lexical disorders.

### INTRODUCTION

Anomy as the starting point in the development of the aphasic syndrome in Alzheimer's dementia was already indicated many years ago (inter al. Kertesz 1979, after: Zec 1993; Appell, Kertesz, Fisman 1982). In the early phase of dementia, difficulties with finding right words appear (the lowered level of availability of words, the phenomenon: "I have it on the tip of my tongue), then substitutions begin to dominate – the patient uses synonyms but also hyperonyms or cohyponyms, describes the appearance of an object and its functions; word uses are imprecise or erroneous (Bayles, Tomoeda 1983; Kempler 1984, after: Bayles, Kaszniak 1987). Because of the use of too many pronouns and words with general meaning (like *thing or place* instead of exactly indicating which word is meant) the patients' speech is defined as "empty speech", "devoid of content" (Kempler

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et al. 1984, after: Hamilton 1994; Nicholas et al. 1985). The greatest problems are associated with low-frequency words (Bayles, Kaszniak 1987).

In order to identify lexical-semantic disorders, diverse types of diagnostic studies have been and are recommended, from test studies oriented towards word fluency and naming pictures (inter al. Pearce and Miller 1973, after: Marczevska 1994; Shuren et al. 1993; Montanes et al. 1996; Cappa 1998; Whatmough 2003), to studies on monologic and dialogic utterances, including spontaneous ones (inter al. Bayles 1982; Bayles, Kaszniak 1987, and Orange 1996). Different tasks given to patients show in how many different ways lexical-semantic disorders manifest and how the patient's communication abilities diminish.

### PROBLEMS AND RESEARCH MATERIAL

The study was conducted on the linguistic material gathered under the research project "Narrative and Its Disorders in Alzheimer's Dementia. *The Scale of Narrative Skills* in Alzheimer's Dementia" (project manager: Dr Aneta Domagała; 39<sup>th</sup> Ministry of Science and Higher Education competition of research projects). The utterances of patients (recorded and then transcribed) were obtained using the auxiliary materials (photographs, illustrations) compiled thematically to elicit basic forms of utterances (description of a human figure; description of a place; description of a situation; narrative). Lexical difficulties are one of the pathological symptoms taken into consideration in the assessment of the patient's speech carried out using the author's original "Scale of Narrative Skills": the results discussed in the present article are of necessity fragmentary.

With regard to the collected utterance samples I based the analysis of lexical difficulties essentially on Ullman's classification of semantic neologisms (I used its presentation in the studies by S. Grabias and his typology of neologisms 1981, 1982); for the categorization of pathological phenomena the findings in aphasiology made years ago in the studies by Maruszewski (1970), Zarębina (1973), Mierzejewska (1977), and Przybysz-Piwko (2000) proved very useful. My own original model of description of lexical difficulties (with slight modifications as compared with the previous one – Domagała 2005; 2007; 2008) permitted taking into consideration a broad range of phenomena shown in English literature on speech disorders in dementia. The objective of my studies was to establish the register of lexical difficulties in patients with Alzheimer's dementia and to describe pathological symptoms depending on the degree of dementia progression.

### THE STUDIED POPULATION

A total of 120 patients were studied: 60 subjects with a mild stage of Alzheimer's dementia (equinumerous groups of women /group code: ŁK/ and men /

ŁM/) and 60 subjects with a moderate stage of Alzheimer's dementia (in the same way: UK, UM – these codes are used in the article to describe the exemplificative material, adding the serial number of the patient investigated). The mean age of the studied population was 76 years and 7 months (for the mild-stage dementia subjects – 76 years and 5 months; for the moderate-stage subjects – 76 years and 8 months).

Those investigated were patients staying in different centers in Poland – specialist institutions providing help to persons with Alzheimer's disease. Empirical studies were conducted by me in person, each time in an individual contact with the patient studied.

Field studies were carried out at the following centers: Wrocław Medical University's Research and Teaching Center for Dementia Diseases located in Ścinawa – Department of Psychogeriatrics; the Prof. M. Kaczyński Neuropsychiatric Hospital in Lublin – Psychogeriatrics Department; Rev. Jerzy Popiełuszko Nursing Home in Toruń – Daycare Department; Residential Medical Care Facility for Alzheimer Patients in Koprzywnica; Nursing Home for Alzheimer Patients in Górno (John Paul II Independent Public Complex of Healthcare Facilities); Alzheimer Center in Warsaw – Daycare Department and Nursing Home; Community Home of Mutual Aid for the Wola District in Warsaw – Community Center for Patients with Alzheimer's Dementia Syndrome; Community Home of Mutual Aid for patients with Alzheimer's Dementia Syndrome in Krakow (Małopolska Foundation for Assistance to Alzheimer's Disease Patients); Daycare and Therapy Center for Alzheimer's Disease Patients in Płock; Community Home of Mutual Aid for Alzheimer's Disease Patients in Łódź (Łódź Alzheimer Society); Support Center for Persons with Alzheimer's Disease in Kielce; Type-C Community Home of Mutual Aid (in Krzemionkowska St.) in Kielce; Community Nursing Home in Poznań (Wielkopolskie Alzheimer Association); Community Home of Mutual Aid for Alzheimer's Disease Patients and Nursing Home "Kalina" in Lublin; Type-C Community Home of Mutual Aid for Alzheimer's Disease Patients (in Lwowska St.) in Lublin; Community Home of Mutual Aid for Alzheimer's Disease Patients "Mefazja" and "Memory" (Lublin Alzheimer Association) in Lublin.

I would like to express my cordial gratitude to the directors and all specialists in those centers for their help and kind attitude which I felt while conducting these studies. I would also like to cordially thank the patients, their caregivers and families for taking part in the studies.

## RESULTS

The analysis of the research material made it possible to compile a register of lexical difficulties (here: with the exemplification of phenomena that are part of the distinguished categories) and to present their qualitative characteristics.

## 1. Register of lexical difficulties

The register of categories of lexical difficulties most frequently occurring in the investigated population took the following form:

1. Temporary, overcome difficulties in actualizing a name, for example:

U. K.: Tu jest... Zaraz pani powiem, bo ja ostatnio to gubię słowa... To jest lampka.

B: Uhm.

U. K.: No, nareszcie wykrztusiłam.

[UK28; T2]

2. Changes in the formal structure of lexical units:

2a. Changes in derivational constructions, for example:

U. M.: I tu jest... gołąbyszek. Nie?

[UM17; T4]

(cf. gołąbek – gołąbeczek)

2b. Delexicalization, for example:

U. K.: No a tutaj tato wszedł na krzesło i znowu książki zbiera... Z wysokości wysokiej, dosyć dużej.

[UK2; T3]

(cf. z dużej wysokości)

3. Changes in the meaning of lexical units:

3a. Transference of a name (due to similarity or possibly to the emergence of other semantic associations or contiguity of meanings), for example:

U. K.: Tutaj znowuż jest ta... nóż/ nóżki, jak się to nazywa...

B: Ręce.

[UK23; T1]

(nóżki ‘ręce’)

3b. Transference of meaning (due to similarity or contiguity of names), for example:

T2: U. K.: No i pantofle se ktoś zostawił i no chyba to wszystko, co mogłam wygdukać.

[UK13; T2]

(cf. wydukać – wygdukać)

## 4. Quasi-nomination:

## 4a. Quasi-nomination using pronouns, for example:

U. M.: Ten bardziej jest szybki, ja nie chodziłem, a ten... to mają takie, są te, jak to nazwać... on robi ten. I tu wewnątrz będzie coś, żeby piesy nie zjadły.

[UM4: T4]

4b. Quasi-nomination: the use of words with a too general meaning, pointing to basic semantic features (of the type: object, activity), for example:

Ł. M.: Ten... chwycił... mmm... element, przy pomocy którego ściągnął, ściągnął z drzewa ptaka.

[ŁM23: T4]

(the element 'drabina')

## 5. Absence of a name:

## 5a. Circumlocution, descriptive utterances:

Ł. M.: Szafka, no tak tu tu tu... Tutaj to jest jest do siedzenia. Tutaj to jest no, do do światła. Tak to wszystko... Tutaj jeszcze jakiś... no, no... do czytania, do czytania mniej więcej są tutaj. W tym miejscu tyle jest tutaj...

B: Uhm. Jakaś książka.

[ŁM3: T2]

5b. Request for clues, and direct pointing out of lexical difficulties, for example:

Ł. M.: Jedna ubrana jest yyy... jak nazwać to?

B: Jak to nazwać?

Ł. M.: No, założyła... (with an entreating tone)

B: Jakiś sweterek.

Ł. M.: Ooo.

B: Tego wyrazu brakowało?

Ł. M.: Tego wyrazu.

[ŁM5: T2]

The register of lexical meanings comprises the phenomena that appear most frequently in the utterances of the subjects – the quantitative characteristics presented below does not take marginal phenomena into account. However, additional observations were made in the material investigated, e.g.:

– in category 2: changes in the formal structure of lexical units such as a) unsuccessful realizations of words of foreign origin, with a low frequency of use and difficult phonological-phonetic structure; distortions – realization formally

approximating the correct structure of a word recognizable by the interlocutor (e.g. *abitiient* ‘abiturient’); b) non-systemic realizations unrecognizable by the interlocutor (e.g. *zgudnie* in the context preventing the identification of meaning);

- in category 3: changes in the meanings of collocations; assignment of incorrect meanings (e.g. *jak bylam mloda, swiętej pamieci* ‘w młodości’);
- in category 4: quasi-nomination in the form of a persevered name (without a semantic connection; mechanical contiguity).

## 2. Quantitative characteristics of phenomena

When investigating the frequency of occurrence of the foregoing lexical difficulties, the following total ranking of the categories (starting from the category reported in the largest number of patients) was obtained in the studied population:

- 1) changes in the meaning of lexical units (category 3) – 87.50% of the studied population,
- 2) quasi-nomination (4) – 53.33%,
- 3) changes in the formal structure of lexical units (2) – 49.17%, equal with:
- 4) absence of name (5) – 49.17%),
- 5) temporary, overcome difficulties in actualizing a name (1) – 20.83%.

This is reflected in Figure 1.

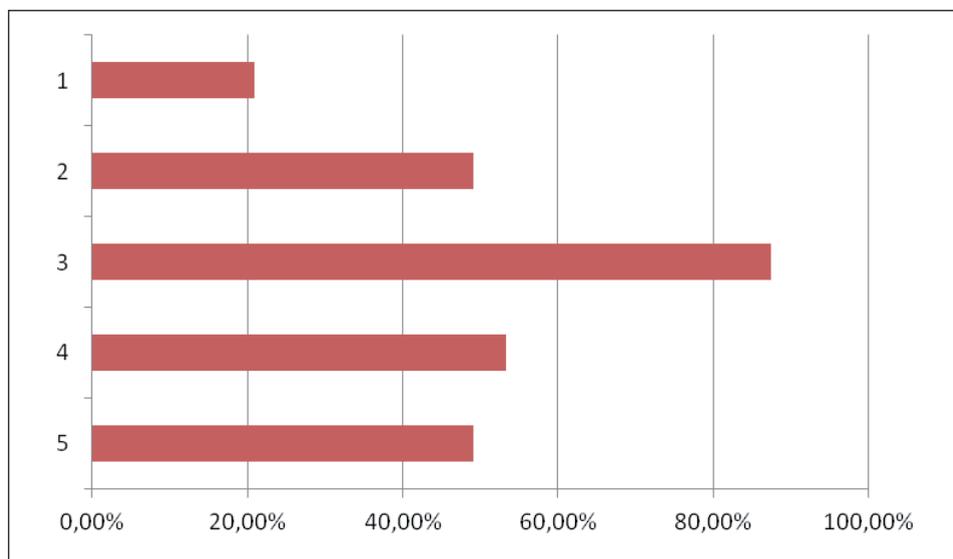


Fig. 1. Lexical difficulties in the total studied population – by category (1 – temporary, overcome difficulties in actualizing a name; 2 – changes in the formal structure of lexical units; 3 – changes in the meaning of lexical units; 4 – quasi-nomination; 5 – absence of name)

After particular phenomena were taken into consideration, the following ranking of subcategories (starting from the subcategory reported in the largest number of patients) was obtained:

- 1) transference of a name (subcategory 3a) – 85.83% of the studied population,
- 2) quasi-nomination using pronouns (subcategory 4a) – 46.67%,
- 3) request for clues, and direct pointing out of lexical difficulties (subcategory 5b) – 33.33%,
- 4) delexicalization (subcategory 2b) – 32.50%,
- 5) changes in derivational constructions (subcategory 2a) – 29.17%,
- 6) circumlocution, descriptive utterances (subcategory 5a) – 26.67%,
- 7) temporary, overcome difficulties in actualizing a name (category 1) – 20.83%,
- 8) transference of meaning (subcategory 3b) – 14.17%,
- 9) quasi-nomination: the use of words with a too general meaning (subcategory 4b) – 10.00%.

This is illustrated in Figure 2.

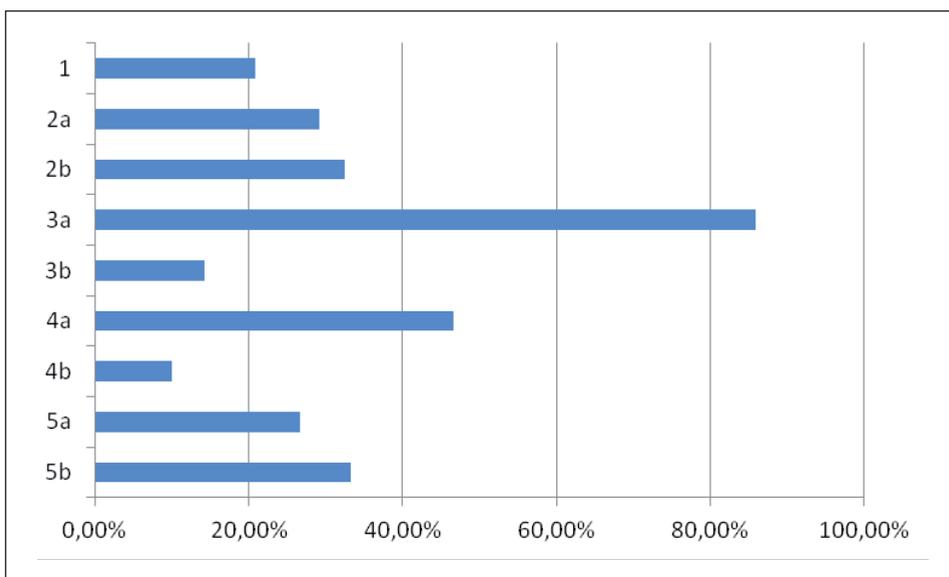


Fig 2. Lexical difficulties in the studied population, including detailed phenomena (1 – temporary, overcome difficulties in actualizing a name; 2a – changes in derivational constructions; 2b – delexicalization; 3a – transference of a name; 3b – transference of meaning; 4a – quasi-nomination using pronouns; 4b – quasi-nomination: the use of words with a too general meaning; 5a – circumlocution, descriptive utterances; 5b – request for clues, and direct pointing out of lexical difficulties)

### **3. Lexical difficulties in the population of patients with mild and moderate stages of dementia. Results of comparative quantitative analysis**

In the case of difficulties manifested in the subjects, the following ranking of categories for the population with mild-stage dementia was obtained (starting from the most often recognized category):

- 1) changes in the meaning of lexical units,
- 2) quasi-nomination,
- 3) changes in the formal structure of lexical units,
- 4) absence of name,
- 5) temporary, overcome difficulties in actualizing a name.

The defined subcategories of phenomena occurred in the following order (from the most frequent): 1) transference of a name; 2) quasi-nomination using pronouns; 3) delexicalization; 4) changes in derivational constructions; 5) circumlocution, descriptive utterances; 6) request for clues, and direct pointing out of lexical difficulties; 7) temporary, overcome difficulties in actualizing a name; 8) transference of meaning; 9) quasi-nomination: the use of words with a too general meaning.

For the subjects with moderate-phase dementia the ranking took the following form:

- 1) changes in the meaning of lexical units,
- 2) absence of name,
- 3) quasi-nomination,
- 4) changes in the formal structure of lexical units,
- 5) temporary, overcome difficulties in actualizing a name.

The subcategories defined the order:

1) transference of a name; 2) quasi-nomination using pronouns; 3) request for clues, and direct pointing out of lexical difficulties; 4) delexicalization; 5) changes in derivational constructions; 6) circumlocution, descriptive utterances; 7) temporary, overcome difficulties in actualizing a name; 8) transference of meaning; 9) quasi-nomination: the use of words with a too general meaning.

With regard to the categories distinguished, changes in the meaning of lexical units were thus found most often in the two distinguished groups, the least frequent being the category of temporary, overcome difficulties in actualizing a name. Inter-group differences are shown in Figure 3.

In the case of the distinguished subcategories, rankings are different because subcategory 5b is three positions higher in the population of patients with moderate-stage dementia (requests for clues, and pointing directly to lexical difficulties).

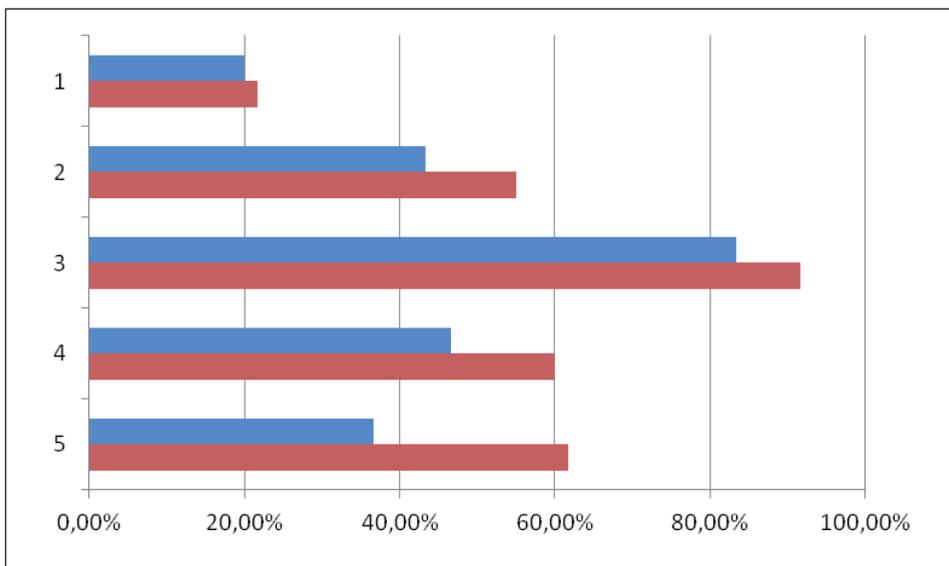


Fig. 3. Lexical difficulties in the population of patients with mild (blue) and moderate (red) stages of dementia (1 – temporary, overcome difficulties in actualizing a name; 2 – changes in the formal structure of lexical units; 3 – changes in the meaning of lexical units; 4 – quasi-nomination; 5 – absence of name)

The detailed data are specified in Table 1, including both the distinguished categories and subcategories of the phenomena for the two compared groups.

Table 1. Lexical difficulties in the population of patients with mild and moderate stages of dementia (1 – temporary, overcome difficulties in actualizing a name; 2a – changes in derivational constructions; 2b – delexicalization; 3a – transference of a name; 3b – transference of meaning; 4a – quasi-nomination using pronouns; 4b – quasi-nomination: the use of words with a too general meaning; 5a – circumlocution, descriptive utterances; 5b – request for clues, and direct pointing out of lexical difficulties).

Category/ subcategory	Mild-stage dementia	Moderate-stage dementia
1	20.00%	21.67%
2	43.33%	55.00%
2a	25.00%	33.33%
2b	26.67%	38.33%
3	83.33%	91.67%
3a	81.67%	90.00%
3b	10.00%	18.33%

Tab. 1.

4	46.47%	60.00%
4a	36.67%	56.67%
4b	6.67%	13.33%
5	36.67%	61.67%
5a	23.33%	30.00%
5b	21.67%	45.00%

The data presented in Table 1 show that each of the analyzed categories (and subcategories) of lexical difficulties was found in a higher percentage of subjects with moderate-stage dementia; in the population of patients with mild-stage dementia the highest differences were found in category 5 (absence of name), the smallest differences – in category 1 (temporary, overcome difficulties in actualizing a name).

## CONCLUSIONS

1. In the studied material the most frequent were changes in the meaning of lexical units (category 3) reported in 87.50% of the subjects (in the mild stage of Alzheimer's dementia – 83.33%, in the moderate stage – 91.67%); in individual persons the phenomena under this category could however occur once or many times: therefore, conclusions about the intensity of the problem should not be jumped to. The most frequent was the transference of a name (subcategory 3a) – 85.83% of the studied population (for the mild stage of Alzheimer's dementia – 81.67%, for moderate stage – 90.00%). Comparatively frequent were also: quasi-nomination (in more than half of the subjects); changes in the formal structure of lexical units (in about half the subjects) – each time more cases of this type of difficulties were reported in the group of patients with mild-stage dementia. On average, one in five subjects also exhibited temporary, overcome difficulties in actualizing a name (inter-group differences were minimal in this case). Except for the last category, as the dementia process progressed the percentage of patients experiencing lexical difficulties typical of Alzheimer's dementia increased, the categories remaining unchanged. In terms of the whole group this leads to the conclusion that in some patients various kinds of lexical difficulties manifest later, at the stage of moderate dementia.

2. Temporary, overcome difficulties in actualizing names, although reported less frequently than others, have high diagnostic values as a category introduced in the description of the material. To distinguish the phenomena falling into this category a principle was adopted that the subject's utterance should prove efforts to seek the right answer largely through the mechanisms (utilized by the

patient) supporting actualization of a name (here: specification of the syntactic context; reference to a work with a similar meaning, a temporary substitute or a challenged substitute; pointing to semantic features, defining; actualization of derivative words; utilization of the phonological-phonetic form of the word, incomplete, fragmentary realization) and through comments, remarks that indicate experiencing lexical difficulties in a particular moment. This situation convinces us that the patient is looking for a specific name, focusing his/her attention on a selected object (while the constantly available photo/illustration creates favorable conditions for that).

3. Lexical difficulties in patients with dementia may be hidden (just to name such phenomena specified in literature on the subject as: reduction in linguistic activity when experiencing lexical problems, changing the topic, diminished information content of utterances, or intentional escape behavior (Bayles 1982; Illes 1989; Shuren et al. 1993; Hamilton 1994; Domagała 2003; Domagała et al. 2003). In this context, in the analyzed material, attention focused e.g. on syntactically disordered utterances: broken-off sentences or sentences realized with omission of the component that the patient cannot actualize (e.g. *Bo tu jest i zegar i i... na ścianie* – a clock and a picture [omitted] on the wall). While s/he is talking, the difficulties manifesting in this way become noticeable in direct contact with the patient.

4. In speech therapy it is necessary to conduct multifaceted analysis (qualitative but based on a sufficient number of quantitative data) of lexical-semantic difficulties in particular units of speech pathology characterized by the occurrence of difficulties in this respect. The collection of a sufficient number of quantitative data will help diagnose the specificity of these disorders and determine the frequency of their occurrence in a population – approximate estimates are not sufficient here. Detailed findings enhance the value of the diagnostic and therapeutic process (cf. e.g. E. Muzyka-Furtak 2008, 2010 – for the population of deaf persons).

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