



Monika Porwoł<sup>1</sup>

UDC 811.111'36:811.162.1'36]:004.738.5

## **MANIFOLD CONTEXTS OF THE WORD *LADDER* [EN]/*DRABINA* [PL] IN THE LIGHT OF DIGITAL HUMANITIES: A PILOT STUDY**

**Abstract:** *This article describes a pilot study pertaining to the linguistic analysis of meaning with regard to the word ladder[EN]/drabina[PL] taking into account views of digital humanities. Therefore, WordnetLoom mapping is introduced as one of the existing research tools proposed by CLARIN ERIC research and technology infrastructure. The explicated material comprises retrospective remarks and interpretations provided by 74 respondents who took part in a survey. A detailed classification of multiple word's meanings is presented in a tabular way (showing the number of contexts in which participants accentuate the word ladder/drabina), along with some comments and opinions. Undoubtedly, the results suggest that, apart from the general domain of the word offered for consideration, most of its senses can usually be attributed to linguistic recognitions. Moreover, some perspectives on the continuation of future research and critical afterthoughts are made prominent in the last part of this paper.*

**Keywords:** *digital humanities, CLARIN ERIC, plWordNet, WordnetLoom Viewer, linguistic analysis, pilot study*

### **Introduction**

I will begin with a synopsis of digital humanities and its instruments related to the underlying matters, i.e. a variety of language investigation resources and techniques of natural language processing. I will then describe my project aimed at analyzing the meaning(s) of the exemplary word *ladder/drabina* by means of retrospective questionnaire. The main purpose is to examine whether and how differences and/or a multiplicity of meaning(s) are reflected in the digital realm.

### **Background**

Semantic analyses in the area of cognitive linguistics have often been based on corpus based methods (Divjak 2006, Arppe 2008, Gries & Divjak 2009, Glynn 2009/2014/2015, Krawczak 2015). Even though fascinating studies have been conducted, cognitively-oriented investigations pertaining to words senses

---

<sup>1</sup> Senior Lecturer at the State University of Applied Sciences, Racibórz, Poland.

(that incorporate naturally occurring data with corpora) are quite rigorous, quantifiable and they tend to exclude introspective methods. The exception is the study of polysemous words as network-like categories with many interrelated senses of 'to run' performed by Gries (2006). Here, the author does not advocate to use the corpus evidence alone, because it is usually not large enough (Gries, 2006: 87) to obtain reliable uses of a given lexeme.

The second generation humanities pertains to a synergy of the humanistic thought and knowledge with the digital tools that deal with the so-called 'big-data' analysis (i.e. processing, visualization, presentation and popularization of research results). The contemporary humanities deal with a variety of issues, such as: (a) the global society of knowledge, information and digitalization; (b) the basis of visual communication (infographics, hypertext, video blog, messenger, chat room, social networking, etc.); (c) fundamentals of computer design and editing; (d) interactive literature; (e) the correspondence of arts and science, (f) an introduction to visual reality (VR), etc.

Moreover, the intersection of 'the humanities' plus 'the digital' gave rise to social and cultural conditions, in which the humanities became subject to new scientific perspectives and developing new research methods (Schreibman et al. 2004, Radomski & Bomba 2013, Radomski 2014, Bomba et al. 2016). An impressively large number of techniques, computer tools, platforms, applications came gradually into existence under the category of 'digital' and changed the pattern of humanists' performance, ways of collecting data, as well as the analysis and dissemination of their findings. By the same token, computer scientists have a tendency to treat the digital humanities as the study of how an electronic form stimulates the disciplines in which it is used and how these fields of knowledge contribute to the computing elaboration.

### **Digital humanities (DH): a definition**

In order to research a capacious statement of the meaning and significance, I first commenced online Google search with Wikipedia that provides a justly far-reaching definition of digital humanities, as:

“[...] an area of scholarly activity at the intersection of computing or digital technologies and the disciplines of

the humanities, it includes the systematic use of digital resources in the humanities, as well as the reflection on their application. DH can be defined as new ways of doing scholarship that involve collaborative, trans-disciplinary, and computationally engaged research, teaching, and publishing. It brings digital tools and methods to the study of the humanities with the recognition that the printed word is no longer the main medium for knowledge production and distribution.”

It has to be pointed out, however, that the Wikipedia’s explication is rather a working definition, which omits matters that actually concern people working in this field of knowledge, for instance: the question of equidistance between ‘digital humanities’ and ‘humanities computing’, or whether efforts directed to accomplish research goals occur only in DH academic departments (Kirschenbaum 2010).

On the other hand, Svensson (2010) claims that:

“[...] humanities-based engagement with information technology is not new, but we are now seeing a rich multi-level interaction with the "digital" that is partly a result of the persuasiveness of digital technology and the sheer number of disciplines, perspectives and approaches involved. Humanists are exploring differing modes of engagement, institutional models, technologies and discursive strategies. There is also a strategy-level push for the digital humanities which, among other things, affects university research strategies, external funding and recruitment.”

The digital investigations expand the amount of material and computer science infrastructure that scholars can access and process in any given amount of time just to facilitate their work in the digital sphere.

Many definitions of DH found in the sources do not fulfill a satisfactory outcome, which depends on various factors and purposes of DH modes of engagement. An interesting compilation of statistical facts with regard to this field and the quest to

provide the DH definition was performed by Melissa Terras<sup>2</sup>. She developed an infographic representation of DH in a quantifying form that provokes for comments and further deliberations on language resources and technological tools. One of them is CLARIN ERIC (Hinrichs and Krauwer 2014, *Lingua* 2016: 1-4).

### **Comon Language Resources and Technology Infrastructure, European Research Infrastructure Consortium (CLARIN ERIC)**

It is an European 'roadmap of projects' as far as research archives, tools and infrastructure in humanities and social sciences are concerned. It offers a multiplicity of language resources (i.e. digital archives, electronic dictionaries, corpora, language models, etc.) on the Internet and in electronic forms (i.e. press releases, texts or blogs, etc.), as well as software tools for natural language processing to language investigators (Hinrichs and Krauwer 2014: 1525).

Scholars who are engaged in researching large quantities of text may find useful information and guidelines rooted in computational linguistics, language and speech technology, natural language engineering in 19 member countries<sup>3</sup>.

The 'seeds' of modern computerized database are evident in many text-based taxonomies and indexing systems. Humanists can use various relational databases as the engines behind complex visualization systems, text archives and multimedia works. Even a simple application may be developed to a well-designed and efficient database, in which an entire set of ontological relations may be capable of generating statements about a given domain. Therefore, a single word (e.g. *ladder/drabina*) can be detected in terms of the context of its synonyms set, or the lexical equality of ratios proportion (i.e. analogy) may be found.

One of the number of Polish language resources is 'plWordNet'. It is a lexico-semantic network which currently contains 178,000 word forms, 259,000 word senses, and over 600,000 relations (that are constantly updated). It has got numerous applications, one of which is a Polish-English and

---

<sup>2</sup> Professor of DH in the Department of Information Studies, University College London, and Director of UCL Centre for DH.

<sup>3</sup> See: <[www.clarin.eu](http://www.clarin.eu)>

English-Polish dictionary (the effect of mapping onto Princeton WordNet). Additionally, 'plWordNet' is an essential resource in natural language processing, as well as in artificial intelligence research (e.g. it is used by Google Translate for the purpose of machine translation).

The relationship by which language is anchored onto the world is called *reference*. Moreover, the semantic links between elements within the system of nomenclature is an aspect of meanings. In 'plWordNet', senses are interconnected by relations. For example, in the resulting network, the lexeme *ladder/drabina* is defined implicitly in reference to other words and presented in a 'concept map' via WordNetLoom Viewer (an application enabling the display of plWN entries). In computer science, mapping is used in argument representation and illustration of schemes for depicting cyberspace and the web. The semantic network of the word *ladder/drabina* is shown on the screenshots presented below. The first one (1a) represents semantic relations, i.e. synonymy {partial, (inter)register, (inter)pragmatic}, hyponymy, holonymy, meronymy, hyperonymy. A path to the highest hyperonym is constructed in the following order: an entity, physical entity, object, artifact, stairway. The second screen grab (1b) envisages some hyponyms of the word *ladder/drabina*, such as: *Jacob's ladder*, *rope ladder*, *scaling ladder*, *Szczerbowski's ladder*, *step ladder*, etc.

W WordNetLoom 1.65 (WordNetViewer) Słowniczek: 1.0  
 Plik Edycja Perspektywa Inne Okno Pomoc

Relacje jednostek Relacje synsetów Edycja synsetów Wizualizacja wordnet...  
 drabina #0

Wszystkie Aspekt: Dziedzina: Relacje: Wszystkie  
 Ogranicz do 500 eleme

Szukaj

Jednostki tekstu/kalibr:  
 drabina 1\* (wytw)  
 drabina 2\* (wytw)  
 drabina analityczna 1\* (umy)  
 drabina hakowa 1\* (wytw)  
 drabina jakubowa 3\* (wytw)  
 drabina Szczerbowskiego 1\* (v

Podgląd

Synset

Właściwości

Jednostki w synsycie:  
 ladder 1\* (wytw)

Status: Nieprzetworzony  
 Komentarz:  
 brak danych

Właściwości:

Relacje jednostki

ladder 1\* (wytw)  
 Od

Przykłady Schowek

Spuściwszy je po drabinie sznurowej, poprzytył em wielkimi gwoździami żerdzie, poukładał em na nich deski i po dwóch godzinach pracy zrobił em  
 najlepsze fosucie maczna trzusa... brzoa przyniższal em do szczepki steni... stw mi iś woda nie zabrza... (KDW.1)

Cache włączony, zapytania: (67%), czas życia: 2 min., zapytań: 1, wielkość: 0 Bys. | Ogólne zużycie pamięci: 158 MB

15:12  
 2017-02-08



manner that all key informants could comprehend them in the same way. The results were compared with pLWN entries, Tweeter and online resources (i.e. NGram Viewer, Google Trends, National Corpus of the Polish Language).

### Hypothesis

The main goal of the preliminary investigation was to check the respondents' perception of the given word in a variety of contexts. It was predicted that the participants will primarily highlight the general understanding of that word in a given domain and then proceed to its interrelated senses depending on their own personal cognition and comprehension of ideas.

### Respondents

In order to obtain a representative (but also sufficient public opinion), I have decided to engage people who claimed to have some linguistic knowledge (i.e. English Philology students, college/university graduates, teachers, linguists, etc.).

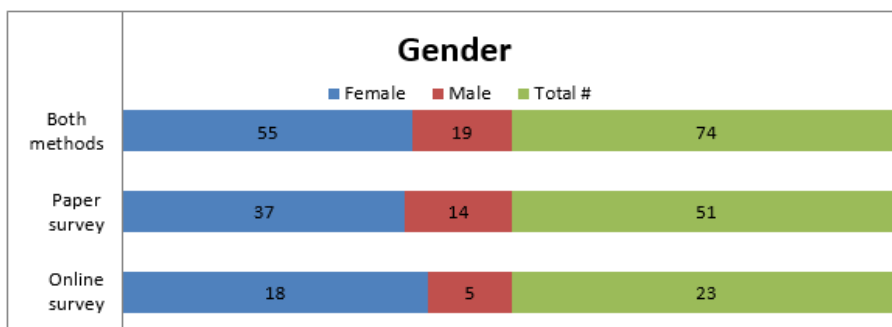


Diagram 1 – The respondent's number and gender

Fundamentally, 74 people took part in a survey: 55 women and 19 men. The above Diagram 1 envisages the subdivision of participants that filled out either paper or online version of the questionnaire. The majority of subjects (72%) were 20-29 years old and at that time they were the second year students of English Philology (see: Diagrams 2 & 3) . The most mature and experienced respondents were between 50-59 years old; nonetheless, they established only 3% of the total number of informants. Interestingly, 16% was represented by people, who claimed to be 40-49 years old and they are college or university graduates (having either BA or MA degree). It must also be underlined that one person that completed the desired



information claimed to have a PhD degree. This particular informant accomplished the set of questions by way of SurveyMonkey and provided an invaluable range of engaging answers that gave rise to intriguing concluding remarks with respect to lexico-semantic analysis of meaning.

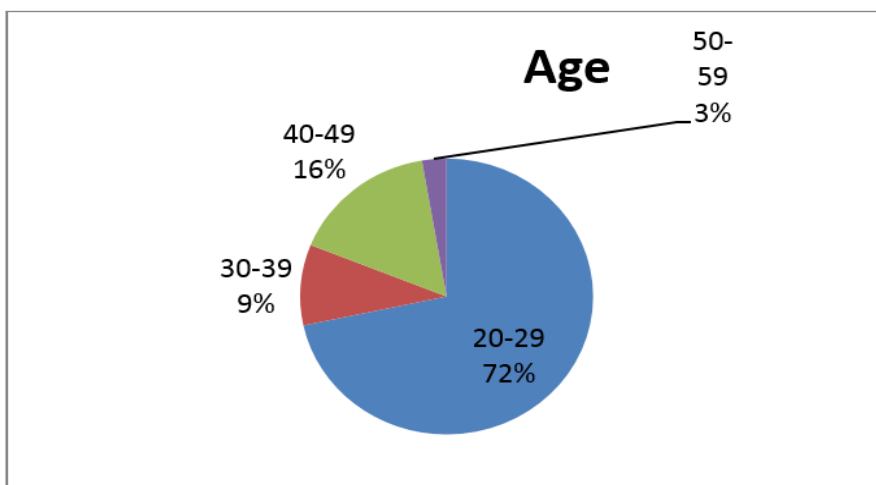


Diagram 2 – The respondent's age

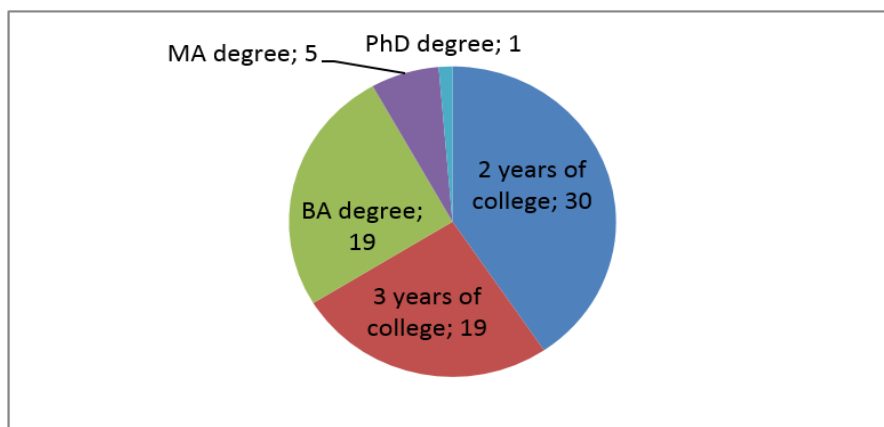


Diagram 3 – The respondent's education

Additionally, I also asked participants to reveal their knowledge of foreign languages with specifying their level of competence. This information is presented in Table 1:

Level of competence	English	German	Russian	French	Spanish	Japanese	Romanian	Czech	Serbian	Italian
<i>Proficiency</i>	9	1	--	--	--	--	--	1	--	--
<i>Advanced</i>	38	--	2	--	--	--	--	--	1	--
<i>Communicative</i>	1	--	--	1	--	--	--	--	--	--
<i>Intermediate</i>	13	10	1	6	--	--	--	1	--	--
<i>Basic</i>	9	45	21	13	6	2	1	5	--	1

Table 1 – The respondent's knowledge of foreign languages

Therefore, it can be commented that English is the most frequent second language that the respondents know and use on the advanced way of communication (both written and spoken). Another most popular foreign language among informants is German (on the basic level). There are the subjects, however, that have claimed to know French, Russian, Czech or even Japanese. In order to establish validity of this information, I asked to provide the equivalent of the word *drabina* [PL]/*ladder* [EN] in a distinguished foreign language. In return, I have received the following feedback information: *žebřík* (Czech), *l'échelle* (French), *die Leiter* (German), *scala* (Italian), *はしご* (Japanese), *scară* (Romanian), *лестница* (Russian), *мердевине* (Serbian), *escalera* (Spanish).

## Discussion

The vast majority of respondents claimed that *ladder/drabina* is an object of climbing to a higher level. A large group described the *ladder* as a hierarchy, e.g.: professional career (from an employee to a director), development and/or success. Some people depicted *ladder* as a wooden or metal object with beams/rungs, or a kind of 'stairs'. Moreover, it was described as a part of the car used by firefighters to extinguish a fire and rescue people. There were some informants that mentioned *Jacob's ladder* as: (1) a phenomenon in physics, (2) the way we have to go through life (metaphorical meaning), (3) overcoming obstacles, (4) the way to the ideal, spiritual development, as well as a *ladder* associated with the biblical story.

The results of the pilot study signalled the general understanding of the expressions in the context of the word *ladder* that corresponded with a provided domain of knowledge. The most straightforward answers were provided with regard to *ladders* associated with the technical profession or skill. The greater part of informants matched *articulated ladder*, *fire ladder*, *telescopic ladder* and *general duty extension ladder* with technical industry (Table 2).

An in-depth study of numerous sources makes prominent the existence of synonyms of the relational word *ladder* in different domains, which intensify its meaning(s). It should be emphasized that the same synonyms can occur in various fields of knowledge, e.g. in literature and art (theater, painting, etc.). For example, the *ladder of beings/great chain of beings* refers to the established order (hierarchy, stage, cycle, sequence, order, etc.). The *ladder* can also be traced back to the SCIENCE domain (and terms related to thinking) that has historical roots. Additionally, it can branch into at least three sub-disciplines: (1) HISTORY: philosophy: biology, (2) HISTORY: philosophy: theology/religion, (3) HISTORY: philosophy: literature /linguistics.

SCIENCE (terms connected with thinking)	HISTORY: philosophy: <b>biology</b> <i>The Great Chain of Beings</i>
	HISTORY: philosophy: <b>theology/religion</b> <i>The Great Chain of Beings</i> <i>ladder of Saint Thomas Aquinas</i>
	HISTORY: philosophy: <b>literature/linguistics</b> <i>The Great Chain of Beings</i> <i>ladder of Saint Thomas Aquinas</i> <i>feudal ladder</i>

Firstly, the *ladder of beings* is referred to a linear system of living organisms, used in biology at the turn of the 18th and 19th centuries; Latin *scala naturae* (Kopaliński, 1987: 220). In ancient times, Aristotle placed metaphysics as a human need for knowledge, which occupied a dignified place in the hierarchy of science. The way of being and non-being is the general expression of "substances of change in the crescent-like sphere up to the self-concocted, which is the ultimate goal of the theoretical, and thus philosophical, life in the cosmos." (Aristotle, 1996: xxix). On the canvas of this conception, the *ladder of beings* was created as the

hierarchy of material objects. A classification of creatures (from the simplest to the complex ones) is dependent on the degree of participation of form and matter in a single being (the whole life). Consequently, Tomism is based on Aristotle's philosophy. One of its assumptions is that a man's destiny is to know the highest goal, i.e. meeting God through the 'light of glory'. According to St. Thomas Aquinas, the *ladder of beings* has a place between angels and animals, and the hierarchy of forms depends on how these forms relate to one another. Thus, the medieval philosophy of beings was supplemented by the question of existence, which in conjunction with the essence is synonymous with substance. Moreover, it is an interesting fact that the *ladder of beings* (as a system of hierarchy) was used in Shakespeare's plays ("Hamlet" & "Macbeth"), in which the social classification (kings-princes-nobility-people) was distinguished. In addition, Nowak (2013, 2014) proves that in today's Polish language it is possible to analyze many linguistic examples with regard to terms attributed to people, animals and plants as the so-called '*ladder of beings in language*'.

It can be detected in Table 2 (see: legend pertaining to the number of responses) that the *ladder of beings* was matched with philosophy by [50] informants, religion {29}, linguistics and esoteric aspects (17). The choice of the last mentioned domain is questionable though, because esoteric association with this phrase seems to be quite doubtful. In contrast, the *ladder of Saint Thomas Aquinas* was linked with religion by [19] participants, philosophy by {17} and linguistics by (15) people.

Apart from the overall aspect of a given expression that was the first selection for the majority of respondents, the second or the third most frequent choice of reference was linguistics. The concepts pertaining to technical language, professions and *Tarot's symbolic meaning of ladder* were exceptions.

From the linguistic standpoint, there are numerous and varied instances in communication when the word *ladder* may be expressed or represented in a metaphorical mode, e.g. *a ladder of dreams*, as well as in terms of idiomatic expressions, for instance: *low man on the ladder*, *the lowest rung on the ladder*, *at the bottom of the ladder*, *I can't see a hole in a ladder*, *crosses are ladders that lead to heaven*, etc. A present pilot study indicates that Polish language users (that took part in it) frequently associate semantic relations (in this case with respect to the

word *ladder*) with the science of language. This trend (with some cases not conforming to the general point) can be seen in the last column of Table 2 presented below:

CONCEPTS	REFERENCE							
	religion	philosophy	business	technics	literature	esotericism	arts	figurative or metaphoric expression
<i>ladder of success</i>	2	(11)	[69]	8	10	--	(11)	{36}
<i>social ladder</i>	(20)	[37]	15	3	(20)	3	7	{32}
<i>ladder of loyalty</i>	(17)	[30]	{23}	2	2	1	1	(17)
<i>corporate ladder</i>	3	5	[63]	{17}	3	1	3	(13)
<i>ladder of Saint Thomas Aquinas</i>	[19]	{17}	1	--	11	8	12	(15)
<i>spiritual ladder</i>	[69]	{27}	2	1	12	(26)	16	18
<i>ladder of beings</i>	{29}	[50]	3	3	11	(17)	9	(17)
<i>Jacob's ladder</i>	[60]	16		2	(22)	1	10	{23}
<i>feudal ladder</i>	3	{23}	17	5	[25]	--	5	(18)
<i>ladder to heaven</i>	[64]	21	3	--	20	8	{26}	(22)
<i>ladder of dreams</i>	7	[41]	13	6	(35)	10	31	{36}
<i>articulated ladder</i>	--	--	1	[63]	2	--	1	1
<i>fire ladder</i>	--	1	3	[69]	5	--	4	2
<i>telescopic ladder</i>	--	--	--	[66]	2	4	2	3
<i>general duty extension ladder</i>	--	1	4	[65]	3	2	1	4
<i>witches' ladder</i>	5	10	--	--	{37}	[42]	(21)	(20)
<i>'Tarot's symbolic meaning of ladder'</i>	2	3	--	--	{13}	[46]	(11)	7
<i>career ladder</i>	3	(13)	[72]	8	10	1	8	{23}

Table 2 – Matching expressions with their reference: the number of answers provided by the respondents

Legend:

[# in square brackets]: the first highest number of responses

{# in curly brackets}: the second highest number of responses

(# in round brackets): the third highest number of responses

What is more, the testees were asked to present their point of view with regard to some general and figurative statements with the lexeme *ladder/drabina*. As it can be seen in Table 3, the answers are varied, but engaging attention.

	I DEFINITELY AGREE	I AGREE	I'm NOT CERTAIN	I DISAGREE	I DEFINITELY DISAGREE
1. 'The ladder of dreams' is a	11	[46]	9	6	2

	metaphor pertaining to life and happiness.					
2.	Walking under the ladder may indicate bad luck.	4	8	12	[29]	21
3.	The ladder is a 'bridge' between a chance of escape and orderly transition from the world of truth to the new covenant.	8	22	[30]	10	3
4.	'The ladder of buyer's loyalty' illustrates the idea of marketing relationship. It indicates the place where the buyer is identified in the service organization.	9	[34]	27	3	1
5.	'Ladder' is a word composed of 6 letters (2 vocalics and 4 consonantals) and/or 6 sounds (2 vowels and 4 consonants).	[50]	{22}	1	--	1
6.	A ladder may depict a timeless hierarchy.	21	[38]	10	4	1
7.	„Even the highest ladder has got the last rung“.	[26]	[26]	17	3	2
8.	A ladder may depict stages in the production process.	11	[46]	13	4	--
9.	Only one person may stand on a ladder.	15	12	9	[29]	10

Table 3 – Respondents' opinions

Statement 5, for example, was accepted by almost all informants, that is quite obvious since they are/were principally philology students or college/university graduates. Responses to statement 9, on the other hand, caused an unexpected astonishment, because from the technical viewpoint presented in many instructions or guides regarding safety hazards it is set forth that: 'Only one person may stand and/or work on a ladder'. It is a customary fact. Opinions connected with other sentences indicate that language users are familiar with connotative senses of the word *ladder/drabina* both in their mother tongue, as well as in the English language.

## Conclusion

Essentially, in the present work there are several observations made. I have determined that a great part of survey participants is able to unify the meanings of the word *ladder/drabina* by matching a direct sense out of the provided collection of word meanings in the adequate context. Language users can easily determine the denotative meanings of the word, as well as exemplify that lexeme in connotative sentences by illustrating their point through metaphors or idiomatic expressions. However, in several instances the answers were

marked by doubt due to a lack of knowledge, uncertainty or carelessness in answering the questions. In other words, the majority of subjects took notice of the general understanding of the word *ladder/drabina* in an ordinary domain and then proceeded to its interrelated senses (depending on the personal wisdom and understanding of concepts). The linguistic background, however, was indispensable in determining the word's annotations.

I am aware that the present study has shortcomings. First of all, it has to be claimed that the research is limited in scope: (a) rather a small group of respondents involved in the preliminary investigation, (b) the study involved only Polish language users that have a good command of the English, (c) only one lexeme (*ladder/drabina*) was taken into account, etc. Another critical argument is the necessity to undertake a larger empirical study based on concrete instruments found in digital infrastructure. The present work is treated here as a prelude to an extensive investigation of semantic links between elements within the particular language vocabulary systems and their multitude of references appearing in the digital reality. For this reason, the special software and/or application is in preparation that will indicate a given word (for instance on Tweeter) and assign that vocabulary item to its key senses provided by language users. Hopefully, the present pilot study will be supplemented in the future with the possibility to check the frequency of given words that exist in the digital sphere. It is known that the results of further studies shall employ a larger group of online testees (global language commons), involve different language combinations (a variety of codes), detect and visualize (by means of info-graphics) the synergy of meanings, as well as semantic disruptions in symbols valuation with the use of tools offered by the IT industry.

## **References**

- Arppe, Antti. *Univariate, bivariate and multivariate methods in corpus-based lexicography – a study of synonymy*. [PhD Dissertation] Publications of the Department of General Linguistics, University of Helsinki, No. 44., 2008. Web 9 October 2017  
<<http://urn.fi/URN:ISBN:978-952-10-5175-3>>.
- Aristotle. *Metafizyka [Metaphysics]* (the Polish text: A. Krąpiec, A. Maryniarczyk, translation T. Żeleźnik on the ground of KUL Publications, Lublin 1996). Warsaw: De Agostini, 1996.

- Bomba, Radosław, Andrzej Radomski and Ewa Solska, eds. *Humanistyka Cyfrowa. Badanie tekstów, obrazów i dźwięku*. Lublin: E-naukowiec, 2016.
- Divjak, Dagmar. "Ways of intending. Delineating and structuring near synonyms". *Gries, S.Th. & A. Stefanowitsh (eds.)* (2006): 19-56.
- Evans, Vyvyan, and Stéphanie Pourcel, eds. *New Directions in Cognitive Linguistics*. Amsterdam/Philadelphia: John Benjamins Publishing Company, 2009.
- Glynn, Dylan. "Polysemy, syntax and variation. A usage-based method for cognitive semantics". *Evans, V. & S. Pourcel (eds.)* (2009): 77-104.
- Glynn, Dylan. "Techniques and tools. Corpus methods and statistics for semantics". *Glynn, D. & J.A. Robinson (eds.)* (2014): 307-341.
- Glynn, Dylan, and Justyna A. Robinson, eds. *Corpus Methods for Semantics: Quantitative Studies in polysemy and synonymy*. John Benjamins, 2014.
- Glynn, Dylan. "The socio-cultural conceptualisation of FEMINITY. Corpus evidence for Cognitive Models". *Kosecki, K. & J. Badio (eds.)*(2015): 97-117.
- Gries, Stefan Th. "Corpus-based methods and cognitive semantics: The many senses of *to run*". *Gries, S.Th. & A. Stefanowitsh (eds.)* (2006): 57-99.
- Gries, Stefan Th., and Anatol Stefanowitsch, eds. *Corpora in Cognitive Linguistics. Corpus-Based Approaches to Syntax and Lexis*. Berlin/New York: Mouton de Gruyter, 2006.
- Gries, Stefan Th., and Damar Divjak. "Behavioral profiles: A corpus-based approach to cognitive semantic analysis". *Evans, V. & S. Pourcel (eds.)* (2009): 57-75.
- Hinrichs, Erhard, and Steven Krauwer. "The CLARIN Research Infrastructure: Resources and Tools for E-Humanities Scholars." *Proceedings of the Ninth International Conference on Language Resources and Evaluation (LREC-2014)*, May 2014, 1525-31.
- Kirschenbaum, Matthew G. "What is Digital Humanities and What's It Doing in English Departments". *ADE BULLETIN*. Number 150 (2010). Web. 20 August 2017  
<[https://mkirschenbaum.files.wordpress.com/2011/01/kirschenbaum\\_ade150.pdf](https://mkirschenbaum.files.wordpress.com/2011/01/kirschenbaum_ade150.pdf)>.
- Kopaliński, Władysław. *Słownik Mitów i Tradycji Kultury*. Warsaw: Państwowy Instytut Wydawniczy, 1987.
- Kosecki, Krzysztof, and Janusz, Badio, eds. *Empirical Methods in Language Studies*. Frankfurt am Main: Peter Lang, 2015.
- Krawczak, Karolina. "Negative self-evaluative emotions from a cross-cultural perspective. A case of 'shame' and 'guilt' in English and Polish". *Kosecki, K. & J. Badio (eds.)*(2015): 117-136.
- Lingua – special issue on CLARIN (open access), with seven articles that present original research conducted by using services that CLARIN offers. *Lingua*, volume 178 (July 2016): 1-126.
- Nowak, Tomasz. "Kim (czym) jest zwierzę i kto (co) jest zwierzęciem? Garść uwag językowych". *Linguistica Copernicana*. 1.9 (2013).
- Nowak, Tomasz. "O drabinie bytów w języku". *Speculum Linguisticum*, vol.I, Warszawa, (2014): 9-22.



- Radomski, Andrzej. *Humanistyka w świecie Informacjonalizmu*. Lublin: E-naukowiec, 2014.
- Radomski, Andrzej and Radosław Bomba, eds. *Zwrot Cyfrowy w Humanistyce. Internet / Nowe Media / Kultura 2.0*. Lublin: E-naukowiec, 2013.
- Schreibman, Susan, Roy Siemens and John Unsworth, eds. *A companion to digital humanities*. Blackwell Publishing, 2004.
- Shakespeare, William. *Makbet*. (translation: Jerzy S. Sito). Warsaw: KWE, 2000.
- Shakespeare, William. *Hamlet*. (translation: Jerzy S. Sito). Poznań: Polskie Media Amer.com, 2002.
- St. Thomas Aquinas. *Dzieła wybrane*. (translation: J. Salij on the basis of Polska Prowincja Dominikanów Publications "W drodze", Poznań 1984). Warszawa: De Agostini, 2001.
- St. Thomas Aquinas. *Traktat o człowieku I/II*. (on the basis of *Traktat o człowieku, Summa Teologii 75-89; 82-89*, translation: S. Swieżawski, Wydawnictwo ANTYK, Kęty 2000), Warsaw: De Agostini, 2002.
- Svensson, Patric. "The landscape of Digital Humanities". *Digital Humanities Quarterly*. 4.1 (2010). Web. 20 August 2017  
<<http://digitalhumanities.org/dhq/vol/4/1/000080/000080.html>>.
- Terras, Melissa. Blog. Web. 20 January 2012  
<<http://melissaterras.blogspot.com/2012/01/infographic-quantifying-digital.html>>.
- Wikipedia. "Digital humanities". Wikimedia. Web. 9 August 2017  
<[https://en.wikipedia.org/wiki/Digital\\_humanities](https://en.wikipedia.org/wiki/Digital_humanities)>.