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Linguistics and philosophy: the dimensions of the 21st century

Abstract

The article highlights the new dimensions for the integral interaction between linguistics and philosophy in the 21st century. Starting from the philosophical conceptions of B. Russell and L. Wittgenstein the question of how to acquire the linguistic knowledge – by experience or reasoning – still brings about scientific debate. In the present paper we give reasons to the idea that philosophy based on language analysis is one thing; the basing of language analysis on philosophy is quite another. Modern applications of the linguistic analysis based on the use of philosophical methods and categories are suggested; the choice of language means for the effective human-computer interaction via graphical user interfaces of computer software is one of them. The main focus of the article is explaining the mechanisms of formal inductive modeling and deductive reasoning that are involved in selecting appropriate language means for the software discourse. Special attention is given to linguistic categorization that serves as a bridge between deductive reasoning and formal inductive modeling.

Keywords: *linguistics, philosophy, induction, deduction, categorization, software discourse*

Abstrakt

Artykuł przedstawia nowe kierunki zintegrowanego badania nad językiem w filozofii XXI wieku. Poczynając od filozoficznych koncepcji Russela i Wittgensteina, do dziś kontynuuje się debatę naukową poświęconą problematyce determinacji znaczenia lingwistycznego – przez doświadczenie lub myślenie. W artykule podjęto próbę wykazania, że filozofia oparta na analizie językowej – to jedno, zaś analiza językowa wywodząca się z filozofii – to zupełnie coś innego. Artykuł proponuje nowoczesną analizę opartą na wykorzystaniu filozoficznych metod i kategorii; jedną z kwestii jest wybór narzędzi językowych w celu skutecznej komunikacji człowiek-komputer za pomocą interfejsu graficznego. Badanie koncentruje się na wyjaśnieniu metod formalnego modelowania indukcyjnego i wnioskowania dedukcyjnego. Powyżej wspomniane metody są wykorzystane w procesie wyboru odpowiednich narzędzi językowych dla oprogramowania komputerowego. Szczególną uwagę zwraca się na kategoryzację językową, która służy jako pomost między wnioskowaniem dedukcyjnym a formalnym modelowaniem indukcyjnym.

Słowa kluczowe: *lingwistyka, filozofia, indukcja, dedukcja, kategoryzacja, dyskurs programowy*

The question of what sort of understanding a theory of language conveys is directly related to the understanding of what branch of knowledge the study of language belongs. The traditional problem of modern linguistics – how should the linguistic knowledge be acquired – by experience or reasoning – still requires an answer. These questions are on the borderline between linguistics and philosophy, while modern perspectives of modeling human-computer verbal interaction open new challenges in explaining the nature of reasoning and the verbal presentation of mental processes. Due to these new demands, the interrelation between linguistics and philosophy should be revisited, since the philosophy of language is becoming a part of Artificial Intelligence, Machine Learning, Data Mining, and other modern branches of information technologies.

Some of the best-known philosophers of the twentieth century have based their philosophy on an analysis of language. The work of B. Russell (Russell, 1940) with the language of mathematics and his view of mathematical knowledge as merely verbal knowledge eventually led to the notion that much of philosophy could be reduced to problems of language. L. Wittgenstein (Wittgenstein, 1992) devoted most of his philosophy to an analysis of everyday language, establishing the concept of 'language games' that dealt with the study of the functions of words.

Now it has become obvious that philosophy based on language analysis is one thing; the basing of language analysis on philosophy is quite another. The preoccupations of the philosopher are not those of the linguist. Each makes a different use of the tools of language and logic. Although both may make use of formal logic, as do R. Carnap (Carnap, 1942) in philosophy and L. Hjelmslev (Hjelmslev, Uldall, 1957) in linguistics, they use it for different purposes: R. Carnap uses it to build up a language; L. Hjelmslev, to break it down. The philosopher is interested in the direct or indirect proof of linguistic statements. Not so the linguist; indeed, many of the statements the linguist is likely to analyse will be logically irrelevant, since they have to do with emotions and images. The linguist is interested in the form and meaning of all possible statements in a language – questions, commands, value judgments – which form the bulk of everyday discourse and have to be analyzed as meaningful.

Some linguists claim independence from any philosophical assumption by adopting the pragmatic attitude that only facts verified by the senses are valid and that theories can only be summaries of such facts. But this in itself is a philosophical assumption which shapes the theory.

It is such philosophical assumptions of linguistics, rather than the linguistic assumptions of philosophy, that are relevant to the conceptual foundations of language theory. And these may differ in two fundamental respects – on the concept of man, and on the concept of knowledge.

Since language is a human activity, different ideas on what human activity involves produce different notions on what a language is. Human activity may be regarded as wholly physical (the mechanist view), or as largely mental (the mentalist view).

Within the mechanist paradigm the man considers the mind as an extension of the body, different only in that the activity of the mind is more difficult to observe. The difference between the mental and the physical, between the animate and the inanimate, is in their complexity. They are essentially the same; the difference is only in degree. All human activity, including language, is a chain of material cause-effect sequences; if one knew the entire history of a person's nervous system one would know what he would say in any given circumstances.

Language descriptions based on such theories tend to present the language mainly as a system of forms rather than as a collection of meanings. One outstanding example of a theory based on this mechanist view of man is that of L. Bloomfield and his school (M. Joos, G. L. Trager, B. Bloch) (Bloomfield, 1933).

In opposition to the mechanist view, the mentalist view maintains the traditional distinction between mental and physical. Acts of language are mainly mental acts and, although they may very well be correlated with the physical acts of speech, they are acts of a different type. The difference is not only one of degree; it is essentially a difference of kind. Linguistic activity cannot therefore be classed as physical activity. There is a fundamental difference between the performance of the human mind and the animal behaviour. The animal can be conditioned to respond in a certain way; man, in addition to this, knows the right way to go on, on the basis of what he has been taught. Analogy, an instance of this capacity, is what makes language possible. Much of human behaviour is voluntary behaviour; it is essentially different from the conditioned behaviour of animals. Language, being a human and social phenomenon, cannot therefore be regarded simply as a physical or an animal act. It must be regarded from the point of view of the ideas and feelings peculiar to man.

Language descriptions based on a mentalist view are likely to give a great deal of importance to meanings, the mental part of language, and not exclusively to the physical forms. The best-known example of a language theory developed from a mentalist point of view is that of F. de Saussure and his school.

The validity of a language theory also depends on the type of knowledge it represents-knowledge obtained through the senses, or knowledge acquired through scientific intuition. If a language is described through the observation and classification of facts – this is an inductive approach. If a language is described through the intuition and construction of a model from which all possible facts may be deduced – this is a deductive approach.

According to this approach, the only valid statements about languages are those arrived at by observing linguistic facts, classifying them and making generalizations on what is observed and classified. It is an imitation of the approach used by the sciences of observation. The linguist is to collect specimens of speech acts, observe them, and classify the differences. Although he can obviously do this for only a small sample of all speech acts performed in any one language, he makes generalizations on what he has observed and applies these to the unobserved remainder on the assumption that his sample contains everything of significance.

Within the inductive theory the research is based on observation, whereas the deductive theory deals with perceiving a pattern, constructing a theoretical model, and testing how much can be deduced from it. The making of the right model is a matter of scientific intuition. It is done by making explicit the unconscious rules which every speaker of the language possesses; it is the codifying of one's intuitive notions of the structure of the language. One must therefore necessarily know the language before one can codify it in this way. A deductive linguist must first possess the language he wishes to describe.

Descriptions of language based on this type of theory are likely to stress the broadest patterns of the language – the type which can be arrived at most readily through intuition – the system of the parts of speech and syntactic relationships. An example of a deductive theory is that of G. Guillaume (Guillaume, 1963) and the psychomechanic approach to language analysis.

In the era of computational technologies the application of the universal inductive and deductive operations with knowledge has acquired a new meaning in view of the modern cognitive categorization theories. Categorization procedure represents a unique mixture of induction and deductive reasoning, being equally important for linguistics and philosophy. In this paper we try to establish the interconnection between cognitive, linguistic categorization on the one hand, and deductive and inductive manipulations with knowledge on the other. We define categorization as a mental operation with the help of which a human's mind classifies and defines objects and events of reality (Cohen, Lefebvre, 2005, p. 2). Categorization is the way we create our world view, and it is a powerful instrument of cognition. Modern cognitive theories of categorization partially deny Aristotle's 'all or none' categorization principle and deal with category prototypes, basic-level categories that are based on stereotypes in reasoning.

Cognitive linguists mostly base their research on the classification of concrete entities. G. Lakoff was among the first who specified the formation and classification if other types of categories, categories of linguistics (linguistic categories) being among:

> "Most of the discussion of categorization within the philosophical, psychological, and anthropological literature is focused on concrete objects – plants, animals, artifacts, people. It is important that the focus be enlarged to include categories in nonphysical domains. The nonphysical domains-emotions, language, social institutions, etc.-are perhaps the most important ones for the study of mind. Since the conceptual structure of such domains cannot be viewed as merely a mirror of nature, the study of such domains may thus provide a clearer guide to the workings of the mind". (Lakoff, 1987, p. 180).

He emphasizes the importance of studying linguistic categories by observing that "linguistic categories are among the kinds of abstract categories that any adequate theory of the human conceptual system must be able to account for" (Lakoff, 1987, p. 180).

A. Cruse suspects that "cognitive linguistics will eventually have to make its peace with classical categories, and structuralist notions such as lexical relations and semantic components, rather than treating them as enemies to be repudiated at all costs; perhaps they can be incorporated in a way analogous to that in which Einstein's theory of relativity incorporated, rather than repudiated, Newtonian physics" (Cruse, 1992, p. 108).

Along with similarly reconciliatory lines S. Pinker has suggested that the mind employs Wittgensteinian "family resemblance categories" in learning irregular verbs, but uses Aristotelian categories for learning regular verbs. Members of the first type of category must be memorized, while members of the second type of category are subject to rules:

> "The facts about verbs and the facts about concepts converge to suggest that the human mind is a hybrid system, learning fuzzy associations and crisp rules in different subsystems. Most of the recent models of human categorization in cognitive psychology (which are designed to capture people's speed and accuracy when learning artificial categories in the lab) are built out of two parts: a pattern associator for categories based on families of similar exemplars, and a rule selector for categories based on rules ... No model that uses a single mechanism to capture people's behavior with every kind of category does as well as the hybrid models". (Pinker, 1994, p. 279).

Linguistic categorization is definitely based on cognitive categorization, but it differs from in mainly due to its conventional and formal nature. According to G. Lakoff, humans are mostly unaware of cognitive categorization:

> "Most categorization is automatic and unconscious, and if we become aware of it at all, it's only in problematic cases. In moving about the world, we automatically categorize people, animals, and physical objects, both natural and man-made. This sometimes leads to the impression that we just categorize things as they are, that things come in natural kinds, and that our categories of mind naturally fit the kinds of things there are in the world. But a larger proportion of our categories are not categories of things; they are categories of abstract entities ... Any adequate account of human thought must provide an accurate theory of all our categories, both concrete and abstract". (Lakoff, 1987, p. 6).

The author states that we categorize events, actions, emotions, spatial relationships, social relationships, and abstract entities of an enormous range: governments, illnesses, and entities. As a result of categorization humans develop both scientific and folk theories, like electrons and colds. Consequently, any scientific or naïve theory is the result of categorization. Linguistic categorization in this respect can be defined from two perspectives:

1) as a universal means of cognitive and formal coding of linguistic and non-verbal knowledge of the world;
2) as the utilization of the existing set of formally explicit categories to encode and decode various types of knowledge in verbal communication.

It is essential to relate universal philosophical instruments of dealing with knowledge (e.g. induction and deduction) to explain the mechanisms involved in linguistic categorization. The biggest advantage of such a nouvelle approach is the possibility to present linguistic categorization procedures in a formally explicit way.

To start with, it is worth mentioning that all attempts to formally describe the procedure of linguistic categorization will deal with the concept of cognitive modeling, i.e. formal abstract procedures that exemplify reasoning. V. Karasyk defines three linguistic procedures that lay at the core of cognitive modeling:

1) defining types of information (i.e. reference, truthfulness etc);
2) defining information representation (i.e. logical and semantic operators, conceptualization, etc);
3) retrieving information (text understanding, content analysis, classifying and storing information) (Карасик, 2004).

These procedures enable recognition of the types of information and then selection of the appropriate type of abstract formal description to be applied to the input information in order to make it formally explicit. Thus, it's clearly seen that the categorization procedure starts with the deductive reasoning about the nature of the input information. V. Karasyk (Карасик, 2004) suggests three types of deductive models that are involved in verbal communication and prepare the ground for the linguistic categorization. They are communicative, cognitive, and structural deductive models of communication.

The *communicative model* defines the abstract model of the communicative situation that includes the speaker, the listener, the object of communication, and communicative context. The *cognitive model* predefines the abstract description of the situation in terms of propositional logic. i.e. 'subject-predicate' structure. The subsequent extraction of all types of objects and adverbials from the predicate can be described in terms of the 'grammar of the semantic cases' by Ch. Fillmore. The *structural model* is based on the linear syntagmatic relations between the elements of the sentence. The structural model may be of static or dynamic nature. Static structural models predetermine coordination and subordination between sentence members, as well as specify types of subordination (e.g. agreement, government, joining etc). Dynamic structural models allow for the formation of syntactic transformations.

The above mentioned deductive models are basically of an abstract nature and can only be identified by the researchers in the process cognitive interpretation analysis. But when done by humans, they predetermine the choice of the specific linguistic categories, which is actually the result of linguistic categorization.

The materialization and formal representation of deductive models and linguistic categories inferred from them is activated within the procedure of *formal inductive modeling*. Formal inductive modeling aims at classifying existing repertoire of possible grammatical or syntactic categories and making them formally explicit, i.e. selecting the appropriate language form for a particular linguistic category. The selection is based on the already established sets of categories and their explicit categorical forms (e.g. flexions, suffixes, prefixes, compounds etc). The successive scheme of establishing relationships between deductive modeling, linguistic categorization, and inductive modeling is presents in Figure 1.

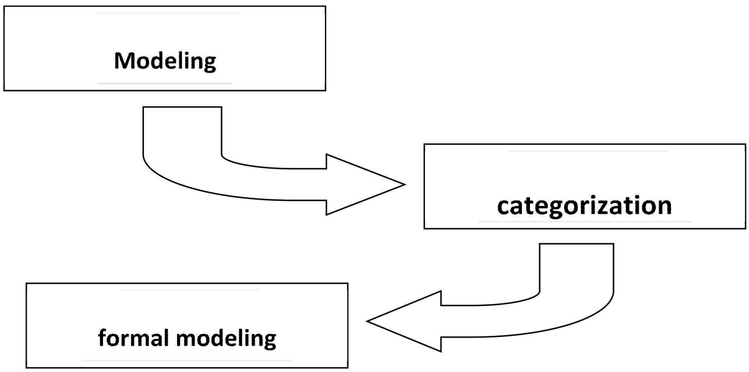

Figure 1: Deductive modeling, linguistic categorization, and inductive formal modeling

Now that we have indicated how deductive reasoning and inductive formalization are based on linguistic categorization, let's consider some examples of their application in modern English software discourse. We define software discourse as the process and result of using verbal means represented in the Graphical User Interface (GUI) of computer software. The remarkable feature of software discourse is that it creates a very specific graphical (formal) environment for the verbal and multimodal communication between a user and a computer program. Apparently, the set of language means used in GUI is limited due to its functional specifications, thus every linguistic category which is activated in software discourse possesses a strong informational and communicative potential.

Formal inductive modeling suggests a specific framework for creating the list of grammatical categories used in the software discourse. The simplified language of GUI generates a unique environment for extracting only the most meaningful and functionally loaded categories out of all possible grammatical variations. We have analyzed the variety of the categories of nouns in modern English software discourse (GUI of Microsoft Office (MO) 2007-2017). As a result, we have arrived at the conclusion that the diversity of noun categories is represented by the following set of oppositions:

– singular/plural;
– countable/uncountable nouns;
– common/proper nouns.

Some nouns used in MO GUI demonstrate the parallel use of singular and plural forms, which is natural for the category of countable nouns. The following examples show the activation of the meanings "multiplication" and "variability" in the software discourse, e.g.:

Accept/Reject Change – Accept/Reject Changes, Accept All changes in Document, Accept All Changes Shown;

Apply Style – Apply Styles, Change Styles, Chart Quick Styles;

Delete Comment – Delete Comments;

Document Property – Advanced Document Properties.

In some cases the use of the plural form indicates not only multiplication, but also a slight functional diversity, as in the following examples:

Add Signature Services;

Word Art Styles;

Insertions and Deletions.

The meaning of the "countable/uncountable" category has its own specific features in the software discourse. In many cases concrete nouns that can potentially be used in their plural form, become uncountable in software discourse, i.e. nouns as setting, tool, option being countable by their linguistic features, are never used in singular form in the names of software functions, and eventually are perceived as pluralia tantum, as in the following examples:

Account Settings, Grid Settings, Grammar Settings, Copy and Paste Settings;

Legacy Tools, Outline Tools, Equation Tools;

E-Mail Options, Header and Footer Options, Hyphenation Options, Mail Options.

Some nouns that normally have both singular and plural forms (e.g. content-contents, datum-data), are used in their specific discourse meanings that slightly differ from their dictionary meanings, e.g.:

Autofit Contents (reshapable data), Table of Contents(automatic catalogue);

Refresh Data, Table Data (specific type of content).

As for the "common/proper names" differentiation, in software discourse all names of the commands and functions are treated as proper names and thus capitalized. Every name of the function is automatically assigned a "proper name" status and is discursively interpreted as one and a whole, as an inseparable unity of its integral parts. All words in the name of the function are capitalized. This capitalization is preserved in all possible software discourse context. However, taken out of the software discourse context, those words lose their "proper name" functions and are treated merely as common names. It should be mentioned that all notional words in the name of the function are capitalized, regardless of their number, e.g.:

Table;

Table Data, Table Eraser, Table Properties;

Table Cell Options, Table Insert Cells, Table Row Height, Table Style Options;

Table of Authorities, Table of Contents, Table of Contents in Frame.

Word-for-word capitalization is used as a marking-up tool to indicate names of the functions in the texts of the dialogue boxes (Figure 2).

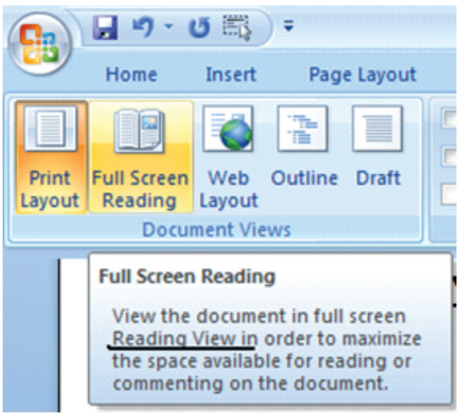

Figure 2: Capitalization of the functions' names in the dialogue box

Apart from the specific instances of capitalization, in the software discourse we have observed the cases where the traditional classes of proper names are used in their traditional categorical meaning. These classes of nouns include:

1) names of software products: *Word 97-2003 Document, Send to Microsoft Office PowerPoint, Get More on Office Online; Microsoft Outlook, Microsoft Project, Microsoft Publisher*;
2) specific names of languages that require specific formatting of documents: *Japanese Greetings, Japanese Postcard, Chinese Envelope, Chinese Translation*;
3) abbreviations of the names of technologies: *XML – Extensible Markup Language; Publish as PDF (Portable Document Format) or XPS (XML Paper Specification), E-mail as PDF or XPS.*

This brief survey of discursively-biased uses of the grammatical categories of nouns has shown that alongside with carrying the core meaning of the category, the discursive meaning of a category may be deduced inferentially, and it can be used as a means of formal inductive modeling in order to merge basic meaning of the category with the specific needs of discourse communication. Software discourse has a limited communication potential and serves mainly for creating an informational environment for the communication between the user and the computer. Thus, the limited choice of the grammatical categories is the result of deductive analysis of software functions on the one hand, and formal inductive modeling of their discursive meanings on the other, which in many cases differs from the traditional set of features that help identifying grammatical categories in other communicative contexts.

Selecting appropriate grammatical categories to be used in software discourse should be subjected to formal deductive logic. And if so, then software discourse may simulate reasoning as a mechanical manipulation of abstract symbols (names of the functions) which are meaningless themselves, but can be given meaning by referring to particular operations that stand behind the names of the functions. Since all modern digital computers base their work on symbol manipulation, the language means used in the graphical user interfaces create a sort of a partial model of reality. A computer, as the agent in communication with a human, can be taken as essentially possessing the capacity to reason. In modern cognitology this is known as a mind-as-computer metaphor (Lakoff, 1987, p. 8).

Since the virtual world of the computer's 'functions' is still based on categorization and is verbally expressed by the language means in software discourse that simulate reasoning, reasoning should always be taken as an associated account of categorization. The view of reasoning as the disembodied manipulation of abstract symbols is inferred from the implicit theory of categorization. Thus, together with their category features, abstract grammatical categories bring about models for deductive and inductive reasoning in the user's mind, and the process of using computer software goes smooth with an extremely limited but well-selected set of categories.

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